Verzoek om interne herziening van de goedkeuringsbesluiten van de Commissie inzake staatssteunbeslissingen ten aanzien van Pallas en NHC

Stichting Laka, gevestigd te Amsterdam, Nederland (hierna: Laka) (**bijlage 1**), verzoekt om interne herziening van de besluiten van de Europese Commissie (hierna: Commissie) van 26 juli 2024 (kenmerken **SA.103925** en **SA.103926**), gepubliceerd op 1 augustus 2025 in het Publicatieblad van de Europese Unie (kenmerk: C/2025/4348) tot goedkeuring van steunmaatregelen van de staten op grond van de artikelen 107 en 108 van het Verdrag betreffende de werking van de Europese Unie[1]. De besluiten gaan hierbij (**bijlage 2** en **bijlage 3**). Het gaat om de goedkeuring van door Nederland aan de projecten Pallas en NHC verleende steunmaatregelen.

De gesteunde activiteit waar het in dit verzoek om herziening gaat, en aspecten van de staatssteunmaatregelen die met deze besluiten van de Commissie zijn goedgekeurd en die niet te scheiden zijn van het doel van de steun, zijn in strijd zijn met een specifieke regel of specifieke regels van het Europees milieurecht. Dit zal in het navolgende uiteen worden gezet.

De gesteunde activiteit: realiseren van de Pallas-kernreactor en het NHC

De door Nederland gesteunde activiteit betreft het realiseren van de Pallas-kernreactor en het Nuclear Health Center (hierna: NHC), nabij bewoond gebied en beschermde natuur. Het hoofddoel van de gesteunde activiteiten is de productie van medische isotopen.

Figure 1: Visualisatie van de te realiseren infrastructuur (Pallas-reactor & Nuclear Health)

[1] https://competition-cases.ec.europa.eu/cases/SA.103925 en https://competition-cases.ec.europa.eu/cases/SA.103926

Nederland draagt € 2.400 miljoen[2] bij aan de realisatie van deze installaties, hoewel inmiddels voor vrijwel alle te produceren medische isotopen minder milieubelastende alternatieven voorhanden zijn.

Ontbreken beoordeling stikstofdepositie van de bouwfase op beschermde natuur

De Nederlandse onder de Habitatrichtlijn[3]en Vogelrichtlijn[4] aangewezen Natura 2000-gebieden zijn zwaar overbelast met stikstof. Dit komt door stikstofdepositie uit landbouw, verkeer en industrie. Laka verwijst in dit verband ter illustratie van de problematiek naar een brief van de Commissie van 16 februari 2024, Ares(2024)1180355 (**bijlage 4**).

De locatie waar deze installaties worden gebouwd, ligt in de directe nabijheid van Natura 2000-gebied Zwanenwater en Pettemerduinen. In dit Natura 2000-gebieden is sprake van stikstofoverbelasting[5]. Recent heeft de Nederlandse Ecologische Autoriteit, ingesteld door de minister voor Natuur en Stikstof, geadviseerd over de Natuurdoelanalyse over het gebied, waarin de gevolgen van met name stikstof voor het gebied wordt beschreven en maatregelen worden geformuleerd. Over de staat waarin de beschermde natuur in Natura 2000-gebied Zwanenwater en Pettemerduinen verkeert, stelde de Ecologische Autoriteit in haar advies van 30 april 2024 onder andere het volgende;

> *"In Zwanenwater & Pettemerduinen is verslechtering niet uit te sluiten, maar kan door gebrek aan informatie niet worden bepaald of verslechtering reeds is opgetreden. Hierdoor is het onzeker of met bestaande maatregelen de doelen gehaald worden."*

En:

> *"Maatregelen die snel genomen moeten worden zijn: het verminderen van stikstofbelasting, het bevorderen van verstuivingsdynamiek, (intensiever) bestrijden van exoten en verminderen van de harde scheiding met aangrenzende landbouwgebieden (bufferzones)."*

De gesteunde activiteit leidt tot een toename van stikstofdepositie op Zwanenwater en Pettemerduinen, waardoor significante effecten op voorhand niet kunnen worden uitgesloten. Daarom is een natuurvergunning verplicht, de door artikel 6, lid 3, van de Habitatrichtlijn vereiste voorafgaande toestemming. In het kader van de vergunningverlening wordt beoordeeld of uitgesloten kan worden dat depositietoenames een significant negatief effect zal hebben op de beschermde natuurwaarden van het Natura 2000-gebied. De gesteunde activiteit leidt immers tot een toename van de stikstofdepositie op de genoemde Natura 2000-gebieden, terwijl de stikstofbelasting juist verminderd moet worden.

Ten tijde van het verlenen van de natuurvergunning voor de gesteunde activiteit, werden vanwege een wettelijke vrijstelling die gold voor stikstofdepositie als gevolg van de bouwfase van een project en die was neergelegd in de Nederlandse Wet natuurbescherming, in deze toetsing echter alleen de

[2] https://zoek.officielebekendmakingen.nl/kst-33626-32.html
[3] Richtlijn 92/43/EEG van de Raad van 21 mei 1992 inzake de instandhouding van de natuurlijke habitats en de wilde flora en fauna
[4] Richtlijn 2009/147/EG van het Europees Parlement en de Raad van 30 november 2009 inzake het behoud van de vogelstand
[5] https://www.natura2000.nl/gebieden/noord-holland/zwanenwater-pettemerduinen

gevolgen voor het Natura 2000-gebied beoordeeld van de exploitatiefase van de gesteunde activiteit, en niet de gevolgen van de bouwfase van de gesteunde activiteit. Op grond van deze partiële toetsing is op 13 december 2021 een natuurvergunning verleend voor NHC en op 5 januari 2022 voor de Pallas-reactor[6]. Deze vergunningen zijn heden onherroepelijk.

Op 2 november 2022 heeft de Afdeling bestuursrechtspraak van de Raad van State in het kader van een procedure tegen de verleende toestemming voor een ander project (Porthos) geoordeeld dat de in de Wet natuurbescherming opgenomen bouwvrijstelling niet voldeed aan artikel 6 van de Habitatrichtlijn[7]. Hoewel de bouwvrijstelling buiten toepassing is verklaard in die uitspraak, geldt dat niet ten aanzien toestemmingen die al waren verleend en (mede) berustten op die tot dan geldende bouwvrijstelling in de Wet natuurbescherming.

Nu de gesteunde activiteit plaatsvindt in de directe nabijheid van het met stikstof overbelaste Natura-2000 gebied Zwanenwater en Pettemerduinen, maar door het toepassen van de vrijstelling voor de bouwfase niet met de vereiste zekerheid is uitgesloten dat de activiteit de natuurlijke kenmerken van de betrokken gebieden zal aantasten, is de staatssteunmaatregel in strijd met Europees milieurecht verleend.

Voor de staatssteun die Nederland heeft toegekend voor de gesteunde activiteit had op grond van deze strijd met Europees milieurecht geen goedkeuring mogen worden verleend door de Commissie. Dit verzoek om herziening dient er daarom toe te leiden dat de verleende goedkeuringsbesluiten worden herzien en dat de Commissie alsnog goedkeuring weigert wegens strijd met artikel 6 van de Habitatrichtlijn.

Ontbreken van toetsing aan het kostenveroorzakersbeginsel radioactief afval

De gesteunde activiteit produceert gedurende de levensduur van de installaties, die bepaald is op 80 jaren, radioactief afval. Dit afval wordt verwerkt zonder dat daarbij het kostenveroorzakersbeginsel op grond waarvan ‘de vervuiler betaalt, is gewaarborgd en in acht wordt genomen. Ook dit is in strijd met Europees milieurecht.

“De vervuiler betaalt” is als leidend beginsel voor het milieubeleid van de Europese Unie neergelegd in artikel 191, tweede lid, van het Verdrag betreffende de werking van de Europese Unie (VWEU). Dit betekent dat producenten van radioactief afval de kosten die samenhangen met de verwerking en de definitieve eindberging van hun afval dienen te dragen.

In Nederland geproduceerd radioactief afval wordt opgehaald door de ophaaldienst voor radioactieve afvalstoffen en splijtstoffen en ertsen bevattende afvalstoffen COVRA[8]. COVRA is volledig eigendom van de Nederlandse Staat. Bij acceptatie van radioactief afval neemt COVRA radioactief

[6] https://zoek.officielebekendmakingen.nl/prb-2021-12361.html (Nuclear Health Center), https://zoek.officielebekendmakingen.nl/prb-2022-235.html (Pallas Reactor)
[7] https://www.raadvanstate.nl/@133608/bouwvrijstelling-stikstof-van-tafel/
[8] https://zoek.officielebekendmakingen.nl/stcrt-2007-246-p48-SC83774.html

afval van producenten over in eigendom. De ophaaldienst doet dit op basis van finale kwijting. Daarna kunnen COVRA noch de afvalproducent verlangen dat radioactief afval aan de producent van het afval wordt geretourneerd, of dat het eigendom weer aan de producent wordt overgedragen[9].

Momenteel is het Nederlandse beleid om in jaar 2130 een eindberging voor radioactief afval in gebruik te nemen. Het is nog niet besloten waar in Nederland deze eindberging wordt aangelegd of hoe deze wordt uitgevoerd. De lange periode tot de ingebruikname van de Nederlandse eindberging en de onzekerheid omtrent precieze planning en de uiteindelijke hoeveelheid radioactief afval in de eindberging zijn een bron van onzekerheid bij de raming van de kosten van de nog te realiseren eindberging. Op grond van het beginsel 'de vervuiler betaalt' zou deze onzekerheid moeten doorwerken in de tarieven voor radioactief afval.

COVRA bepaalt haar tarieven aan de hand van, onder meer, haar kostenraming voor eindberging. In 2017 betrof deze raming €2,05 miljard[10]. In 2024 betrof deze raming € 10,9 miljard[11]. We zien dat COVRA in haar tarieven echter geen onzekerheidsmarge hanteert[12]. In 2018 heeft ook de Nederlandse toezichthouder ANVS, de Autoriteit Nucleaire Veiligheid en Straling, tijdens een inspectie geconstateerd dat in langlopende radioactief afval-contracten bij het bepalen van de kostprijs voor opslag geen onzekerheidsmarge wordt aangehouden[13].

Doordat COVRA bij producenten van radioactief afval geen (effectieve) onzekerheidsmarges in rekening brengt en het afval onder finale kwijting accepteert, dragen afvalproducenten niet de volledige kosten van het door hen geproduceerde radioactief afval.

Omdat het financiële risico van door COVRA geaccepteerd radioactief afval overgaat naar de Staat, kan deze wijze van afvaloverdracht worden gekenmerkt als indirecte staatssteun aan radioactief afval-producenten[14].

In Duitsland en België zijn vergelijkbare staatssteunmaatregelen voor radioactief afval-producenten getoetst door de Europese Commissie en, mede op basis van de in die gevallen voor opslag wel gehanteerde aanzienlijke onzekerheidsmarges, als geoorloofde staatssteun toegestaan en goedgekeurd[15].

Nu COVRA – c.q. de Nederlandse Staat – geen onzekerheidsmarge in rekening brengt voor de opslag en de daaraan verbonden definitieve overdracht van radioactief afval aan COVRA met finale kwijting van de afvalproducent, terwijl sprake is van een aanzienlijke onzekerheid voor wat betreft de

[9] https://www.covra.nl/app/uploads/2020/01/Algemene-Voorwaarden-2025.pdf, artikel 10
[10] https://www.covra.nl/app/uploads/2019/08/Jaarrapport_COVRA_2017.pdf, p. 45
[11] https://www.covra.nl/app/uploads/2025/06/COVRA-jaarrapport-2024.pdf, p. 25
[12] https://www.covra.nl/app/uploads/2021/01/Toelichting-tarieven-2024-1501202.pdf
[13] https://www.laka.org/info/afval/2018-12_inspectierapport_ANVS.pdf, p. 8
[14] Zie ook staatssteunklacht SA.48882, ingediend namens 12 personen door Laka (31 juli 2017)
[15] EC State aid register SA.106107 (België, 2025), SA.45296 (Duitsland, 2017)

uiteindelijke kosten van eindberging, kan niet worden gesteld dat alle kosten die voortkomen uit het beheer van het tijdens de activiteit geproduceerde radioactief afval aan de activiteit worden toegerekend.

Daarmee is het beginsel ‘de vervuiler betaalt’ inzake de gesteunde activiteit niet gewaarborgd. Kosten van radioactief afval die tijdens de gesteunde activiteit ontstaan, worden immers aldus uiteindelijk afgewenteld op de Staat.

De staatssteun aan de gesteunde activiteit draagt daarmee bij aan het bestendigen van een situatie die in strijd is met het Europees milieurecht. De Commissie dient dan ook bij de herziening van de goedkeuringsbesluit alsnog volledig te toetsen aan artikel 191, tweede lid, VWEU dan wel aan het milieurechtelijke beginsel van de Europese Unie dat de vervuiler betaalt.

Strijd met innovatie en milieudoelstellingen onder artikel 173 VWEU

Artikel 173 VWEU vereist dat het industriebeleid van de Unie gericht is op het bevorderen van innovatie, aanpassing aan structurele veranderingen en milieuvriendelijke productie. Staatssteun kan daardoor in strijd komen met de doelstellingen van artikel 173 VWEU indien:

- De steun innovatie ontmoedigt of verdringt;
- De steun leidt tot marktverstarring, bijvoorbeeld door gevestigde technologieën te bevoordelen en toetreding van innovatieve aanbieders te belemmeren;
- De steun leidt tot *lock-in* van milieubelastende productiemethoden, in strijd met het streven naar duurzame industriële ontwikkeling.

In de besluiten tot goedkeuring van de staatssteun voor de Pallas-reactor en het NHC reflecteert de Commissie slechts beperkt op de positie van innovatieve spelers, waaronder SMART en SHINE, die met veel minder risico's voor mens en milieu de benodigde isotopen produceren, waarvoor ook de gesteunde activiteit wordt verricht. Dit zijn uitdrukkelijk slechts voorbeelden; in de EU zijn meerdere innovatieve initiatieven ontwikkeld op het gebied van de productie van medische isotopen, waarbij geen productie door middel van een kernreactor nodig is. De beoordeling in het besluit van de Commissie blijft ten onrechte beperkt tot mededingingsrechtelijke aspecten. De milieu- en innovatievoordelen van deze alternatieven ten opzichte van de gesteunde activiteit worden niet meegewogen. En dat is in strijd met artikel 173 VWEU. De voornoemde, als voorbeeld aangehaalde projecten, SMART en SHINE, beogen de productie van medische isotopen via versnellertechnologie, zonder gebruik van een kernreactor. Dit leidt bijvoorbeeld tot:

- Minder radioactief afval;
- Geen verbruikte splijtstof;
- Verminderd risico op nucleaire proliferatie;
- Minder maatschappelijke onrust;
- Minder grondstoffenverbruik en lagere ontmantelingslasten.

De Commissie erkent dat SHINE en SMART technologische alternatieven zijn, maar stelt dat deze nog onvoldoende zijn gevalideerd op industriële schaal. Daarmee miskent de Commissie dat juist de incidentele schaarste in de afgelopen jaren aanleiding was voor innovatieve initiatieven zoals SMART (voorheen ASML-Lighthouse) om alternatieve productiemethoden te ontwikkelen [16]. Ook de behoudende medische sector zelf heeft in tijden van schaarste actief gewerkt aan alternatieven, zoals PET-scans, waarmee isotopen via cyclotrons kunnen worden geproduceerd. De Commissie stelt in, onder meer, randnummer (54) van het goedkeuringsbesluit (kenmerk SA.103925) dat onderzoeksreactoren waar momenteel door België, Duitsland en Frankrijk in wordt geïnvesteerd tezamen te weinig capaciteit zullen hebben om aan de verwachte vraag naar medische isotopen te voldoen. De Commissie laat bij deze prognose echter mogelijke toekomstige productiecapaciteit bij alternatieven zonder reactor ten onrechte buiten beschouwing.

Door langdurige staatssteun goed te keuren voor de gesteunde activiteit, een klassieke kernreactor met een beoogde levensduur van 80 jaar, creëert de Commissie een structurele toetredingsbarrière voor innovatieve producenten van medische isotopen. Dit leidt tot een *lock-in* van verouderde technologie en ondermijnt zowel het innovatiepotentieel als de milieudoelstellingen van de Europese Unie die gediend zijn met de productie van medische isotopen door middel van minder milieubelastende technieken dan met behulp van een kernreactor zoals wordt voorzien in de gesteunde activiteit.

Deze strijdigheid van het steunen van een activiteit die niet innovatief is, milieubelastend is en innovatieve ontwikkelingen in de weg staat, raakt niet alleen artikel 173 VWEU, maar ook bredere Unierechtelijke kaders waaronder artikel 191 VWEU, dat milieubescherming als doelstelling formuleert, artikel 3 VEU, dat duurzame ontwikkeling als fundamentele waarde van de Unie benoemd en het voorzorgsbeginsel en het beginsel van preventie uit het milieurecht.

Door niet aan de relevante innovatie- en milieudoelstellingen te toetsen in de goedkeuringsbesluiten over de steunmaatregelen aan de Pallas-reactor en het NHC heeft de Commissie de artikelen 173 VWEU en 191 VWEU geschonden en de daarin verankerde essentiële beginselen van Europees milieurecht. In herziening dient alsnog een volledige toetsing te worden uitgevoerd door de Commissie.

[16] Zie ook De Volkskracht, 19 oktober 2018: https://www.volkskrant.nl/economie/hoe-een-revolutionaire-topinnovatie-door-hollandse-zuinigheid-over-de-grens-verdween~b3bf5f4d/, “Toen Patrick de Jager (49) in 2014 in een Brandpunt Reporter-documentaire zag hoe Canada de schaarse medische isotoop molybdeen-99 produceerde, dacht hij: dat kunnen wij bij ASML veel beter.”

De Commissie gaat in de goedkeuringsbesluiten ten onrechte niet in op de gevolgen van mogelijke insolventie

In de besluiten tot goedkeuring van de staatssteun legt de Commissie een aantal voorwaarden op voor de exploitatie van de Pallas-reactor en het Nuclear Health Centre (NHC):

- Er moet sprake zijn van volledige kostendekking (*Full Cost Recovery*, FCR) voor alle producten en diensten;
- Kruissubsidiëring tussen gesubsidieerde R&D&I-activiteiten en commerciële productie is verboden;
- Er moet een redelijke winstmarge worden gehanteerd;
- Een onafhankelijke Monitoring Trustee wordt aangesteld om jaarlijks toezicht te houden op naleving.

Hoewel deze voorwaarden zijn bedoeld om marktverstoring te voorkomen, blijft onduidelijk hoe zij doorwerken in het geval van een structureel verlieslatende exploitatie of een eventueel faillissement van de gesteunde activiteit. Als de Pallas-reactor eenmaal is gebouwd, en bijvoorbeeld door financiële problemen of insolventie niet meer gebruikt wordt voor de productie van medische isotopen, dan zou de gesteunde activiteit alleen nog voor kernenergie-onderzoek kunnen worden gebruikt. Het project zou echter, indien het vanaf het begin beoordeeld was als een activiteit voor kernenergieonderzoek mogelijk nooit substantiële of vergelijkbare staatssteun toegekend hebben gekregen.

Laka vreest dat in de hier beschreven situatie de installatie gebruikt zal worden voor (nog) veel kernenergieonderzoek. En ook daarvoor geldt dat partijen die dan vervolgens diensten van de Pallas-reactor en het NHC zullen afnemen – met name de nucleaire industrie - niet voor alle kosten, inclusief het afbetalen van de kernreactor, zullen betalen, waarmee de gesteunde activiteit de nucleaire industrie zal bevorderen, zonder dat de vervuiler daarvoor betaald. De kosten van de kernreactor en de installaties worden immers betaald met staatssteun.

Een voorbeeld is dat Kerncentrale Borssele staalmonsters met hoge neutronenenflux laat bestralen in de HFR om te zien of deze ook onder bedrijfsduurverlenging nog voldoende taai zijn. Maar de gesteunde activiteit zou dan ook kunnen worden ingezet voor commercieel bestralingsonderzoek ten behoeve van de vele Small Modular Reactors (SMRs) die in ontwikkeling zijn.

Als de gesteunde activiteit zich hier na bijvoorbeeld insolventie op gaat toeleggen, nadat de *business case* voor medisch isotopen niet meer rond komt, verwacht Laka niet dat een prijs voor inzet van de gesteunde activiteit in rekening zal worden gebracht die aan het beginsel van *Full Cost Recovery* voldoet, omdat de door de Commissie in de goedkeuringsbesluiten opgelegde voorwaarden ten onrechte niet zover strekken en niets voorzien ten aanzien van ander toekomstig gebruik van de gesteunde activiteit dan voor de productie van medische isotopen. Mocht de business case voor de gesteunde activiteit niet houdbaar zijn in de toekomst, zoals Laka voorziet, dan blijft over een milieubelastende kernreactor die niet meer kan worden ingezet waarvoor deze met staatssteun werd gefinancierd. Ook dit acht Laka in strijd met de beginselen van het Europese milieurecht, het voorzorgsbeginsel en het beginsel ‘de vervuiler betaalt’.

Indien de *Full Cost Recovery*-verplichting leidt tot structureel hogere tarieven dan die van innovatieve concurrenten, is het reëel te veronderstellen dat de gesteunde activiteit op termijn niet aan haar financiële verplichtingen kan voldoen. In dat scenario is een aanvraag tot uitstel van betaling of faillissement niet uitgesloten. Het verbod op kruissubsidiëring beperkt bovendien de mogelijkheid om verliezen op commerciële activiteiten te compenseren met inkomsten uit gesubsidieerde R&D&I, waardoor het risico op insolventie toeneemt.

Een faillissement zou echter niet betekenen dat de fysieke infrastructuur in de Pettemerduinen wordt ontmanteld. Gezien de beoogde technische levensduur van 80 jaar is het aannemelijk dat de faciliteit in stand blijft, ook bij discontinuïteit van de oorspronkelijke exploitant en beëindiging van de productie van medisch isotopen, waarvoor de staatssteun werd verleend. Dit roept de vraag op of en hoe de *Full Cost Recovery*-verplichting doorwerkt bij een doorstart of overname door een andere partij. Wordt die partij eveneens gehouden aan de FCR-voorwaarden, of ontstaat dan ruimte om tegen marktprijzen te opereren, met mogelijk marktverstorende gevolgen?

De besluiten van de Commissie tot goedkeuring van de verleende staatssteun zijn daarom onvoldoende onderbouwd en in strijd met het beginsel van goed bestuur (‘*good administration*’) en met het voorzorgsbeginsel. De hiervoor geschetste situatie kan immers leiden tot een exploitatie van de Pallas-reactor en het NHC, waarbij naleving van de door de Commissie in de goedkeuringsbesluiten opgelegde voorwaarden niet kan worden afgedwongen, zodat de met staatssteun gefinancierde activiteit kan worden voortgezet of de daarmee gefinancierde installaties voor andere doelen kunnen worden aangewend, zonder naleving van de in de goedkeuringsbesluiten opgenomen voorwaarden. Het is daarom van groot belang dat de goedkeuringsbesluiten van de Commissie worden herzien, zodat de daarin opgelegde, voor de hierboven geschetste scenario’s ernstig te kort schietende voorwaarden worden aangepast. .

Daarnaast is het onduidelijk hoe de *Full Cost Recovery*-verplichting zich verhoudt tot een situatie waarin de Staat besluit om de leningen aan de gesteunde activiteit (deels) af te schrijven. Een omzetting van lening in een gift is immers in beginsel strijdig met het *Full Cost Recovery*-verplichting, dat vereist dat alle kosten – inclusief kapitaalslasten – worden doorberekend in de te hanteren productprijzen.

Tot slot blijft onduidelijk welke instrumenten de in de goedkeuringsbesluiten door de Commissie genoemde ‘*Monitoring Trustee*’ heeft om effectief in te grijpen bij structurele onderdekking inzake de verstrekte leningen. De mogelijkheid om een boete-opslag op de rente toe te passen is genoemd, maar het is de vraag of dit voldoende is om insolventie te voorkomen of marktverstoring te corrigeren. De Commissie lijkt dit ten onrechte niet te hebben getoetst, althans hiervan blijkt niet uit de goedkeuringsbesluiten.

Nu deze “*backend*” van de steunmaatregel onvoldoende is uitgewerkt, voorziet Laka dat als dit scenario werkelijkheid zou worden, wat verre van uit te sluiten is, grote juridische en beleidsmatige onzekerheid zal ontstaan. Een eenmaal opgeleverde faciliteit zal niet eenvoudig buiten gebruik

worden gesteld, maar het voortzetten van de exploitatie zonder duidelijke waarborgen zal leiden tot strijd met de beginselen van Europees milieurecht, waaronder het kostenveroorzakersbeginsel.

De staatssteunbeslissing bevat een uitgebreid kader voor de toepassing van het beginsel van *Full Cost Recovery* en het toezicht daarop, maar laat cruciale vragen onbeantwoord over de robuustheid van dit model bij financiële tegenvallers, insolventie of structurele marktverstoringen. Juist in het scenario waarin de activiteit niet rendabel blijkt en faillissement dreigt, ontstaat een juridisch en beleidsmatig vacuüm: het is ten onrechte in de goedkeuringsbesluiten van de Commissie onduidelijk gebleven of en hoe de *Full Cost Recovery*-verplichting dan nog afdwingbaar is, of hoe een doorstartende partij zich daartoe moet verhouden.

Deze lacune is des te problematischer gezien de fysieke en maatschappelijke verankering van de gesteunde activiteit in Petten, en de lange technische levensduur van de infrastructuur. Zonder duidelijke waarborgen bestaat het risico dat publieke middelen worden ingezet voor een activiteit die – na een faillissement – alsnog tegen marktprijzen opereert, zonder naleving van de doelstellingen die ten grondslag lagen aan de oorspronkelijke goedkeuring van de steun, maar die er mede toe geleid hebben dat deze vervuilende gesteunde activiteit die grote gevolgen kan hebben voor mens en milieu mogelijk is gemaakt.

Laka acht het daarom noodzakelijk dat de Commissie alsnog naar aanleiding van dit verzoek om herziening in de goedkeuringsbesluiten expliciet maakt hoe de *Full Cost Recovery*-verplichting doorwerkt in het geval van discontinuïteit, afschrijving van leningen of een doorstart. Zonder die duidelijkheid dreigt het *Full Cost Recovery*-model een papieren constructie te blijven, met grote risico's voor marktwerking, innovatie en milieubescherming.

Strijd met de Europese m.e.r.-richtlijn

De verstrekte staatssteun en de gevolgen daarvan voor de milieueffecten van de gesteunde activiteit zijn ten onrechte niet in de opgestelde milieueffectrapportage (MER) beschreven en beoordeeld. Dit is onder andere in strijd met de artikelen 3 en 5 van de m.e.r.-richtlijn[17]

Hoewel de staatssteunbeslissingen zelf geen project zijn, vormen deze een essentieel onderdeel van het project, omdat de staatssteun de realisatie van een nucleaire installatie met potentieel significante milieugevolgen mogelijk maakt, terwijl zonder staatssteun het project niet had kunnen worden gerealiseerd. De steun maakt de bouw en exploitatie van een kernreactor mogelijk, en daarmee ook van daarmee samenhangende milieubelastende activiteiten zoals:

- Afvoer van kernafval naar COVRA;
- Stikstofdepositie in Natura 2000-gebieden;
- Risico's voor waterkwaliteit en biodiversiteit.

[17] Richtlijn 2011/92/EU van het Europees Parlement en de Raad van 13 december 2011 betreffende de milieueffectbeoordeling van bepaalde openbare en particuliere projecten

- Belasting van mens en milieu met nucleaire straling.

De staatssteunbeslissingen zijn dan ook besluiten die mede tot deze milieugevolgen leiden en deze milieugevolgen mogelijk maken. Op grond hiervan is het ontbreken van een beschrijving en beoordeling van de gevolgen daarvan in het MER in strijd is met de hiervoor aangehaalde bepalingen van de m.e.r.-richtlijn, maar ook van de daarin opgenomen bepalingen betreffende inspraak en toegang tot de rechter, neergelegd in de artikelen 6 en 11 van de m.e.r.-richtlijn. Daarbij hoort dat een ontwerp van de staatssteunbeslissing in een vroegtijdig stadium met de overige voor de beoordeling van de milieueffecten van het project NHC en de Pallas-reactor van belang zijnde stukken voor het publiek ter inzage hadden moeten worden gelegd. Aan deze verplichtingen uit de m.e.r.-richtlijn is niet voldaan, zodat de Commissie goedkeuring aan de staatssteun had moeten onthouden.

Op basis van het voorgaande had de Commissie moeten toetsen of de wijze van totstandkoming van de besluitvorming inzake de gesteunde activiteit voldoet aan de vereisten van de m.e.r.-richtlijn, wat niet het geval is, zodat de goedkeuring had moeten worden geweigerd.

LUBBERS en DIJK | notarissen

DOORLOPENDE TEKST

van de statuten van

Stichting Laka
gevestigd te Amsterdam

Akte de dato 18 juli 2014

KONINGSLAAN 4
1075 AC AMSTERDAM
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dossier: LG/JP/2014.002891.01/rvw

De ondergetekende,
mr. Leonard Alexander Galman, notaris te Amsterdam,
verklaart dat aan deze verklaring is gehecht de doorlopende tekst van de statuten van de besloten vennootschap met beperkte aansprakelijkheid: **Stichting Laka**, gevestigd te Amsterdam, zoals deze luiden na partiele statutenwijziging bij akte de dato achttien juli tweeduizend veertien, verleden voor ondergetekende notaris.

Getekend te Amsterdam op 22 juli 2014.

Mr L A GALMAN
NOTARIS te AMSTERDAM

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dossier: LG/ 2014.002891.01/JP

STATUTEN

Naam, Zetel en Duur.

Artikel 1.

1. De stichting draagt de naam: **STICHTING LAKA.**
2. Zij is gevestigd te Amsterdam.
3. De stichting is opgericht voor onbepaalde tijd.

Doel.

Artikel 2.

De stichting stelt zich ten doel: Het beschermen van de natuur en het milieu tegen vervuiling in het algemeen en tegen straling, radioactiviteit en kernenergie, in de ruimste zin der woorden, in het bijzonder.
De stichting tracht dit doel te bereiken door:

- de samenleving te informeren over de energieproblematiek in het algemeen en kernenergie in het bijzonder
  a. tijdens manifestaties;
  b. op aanvraag van derden;
  c. door middel van eigen publicaties;
- het archiveren en ontsluiten van informatie;
- het initiëren van en participeren in activiteiten en manifestaties;
- het voeren van procedures;
- alle andere middelen welke tot het doel bevorderlijk zijn.

Boekjaar.

Artikel 3.

Het boekjaar der stichting is gelijk aan het kalenderjaar.

Vermogen.

Artikel 4.

Het vermogen van de stichting zal worden gevormd door:
subsidies en donaties;

- hetgeen de stichting door erfstelling; legaat, schenking of op enigerlei andere wijze verkrijgt;
- hetgeen de stichting verkrijgt uit het aan derden ter beschikking stellen van haar accomodatie en kennis.

Bestuur.

Artikel 5.

De stichting wordt bestuurd door een bestuur bestaande uit tenminste drie leden.
Het bestuur kiest uit zijn midden een voorzitter, een secretaris en een penningmeester.
De penningmeester legt uiterlijk in de maand maart aan het bestuur rekening en verantwoording af van het door hem in het voorgaande boekjaar gevoerde beheer.
De voorzitter en de secretaris kunnen geen tweede funktie vervullen binnen het bestuur.

Bestuurswisselingen.

Artikel 6.

Het lidmaatschap van het bestuur eindigt door overlijden, door verklaring in staat van faillissement, door aanvragen van surseánce van betaling, door onder curatelestelling, alsmede door ontslag door een rechtbank.
Bovendien eindigt het lidmaatschap van een bestuurslid indien alle overige bestuursleden zulks besluiten.
Een bestuurslid heeft de mogelijkheid op eigen verzoek ontslag te nemen.
Bestuursleden nemen steeds voor drie. jaar zitting in het bestuur.
Zij zijn herkiesbaar

Benoeming nieuwe bestuursleden.

Artikel 7.

1. Wanneer in het bestuur een vacature is ontstaan, zal daar in door de overblijvende bestuursleden ten spoedigste worden voorzien door de benoeming van een nieuw bestuurslid.
2. Bij verschil van mening tussen de overblijvende bestuursleden omtrent de benoeming, alsmede wanneer er eniger tijd alle bestuursleden mochten komen te ontbreken en voorts indien de overgebleven bestuursleden zouden nalaten binnen redelijke termijn in de vacature te voorzien, zal *die* voorziening geschieden door de rechtbank op verzoek van iedere belanghebbende of op vordering van het Openbaar Ministerie.

Bevoegdheid van het bestuur.

Artikel 8.

Het bestuur *is* bevoegd tot het sluiten van overeenkomsten tot het kopen, vervreemden of bezwaren van registergoederen, tot het sluiten van overeenkomsten, waarbij de stichting zich als borg of hoofdelijk medeschuldenaar verbindt, zich voor een derde sterk maakt of zich tot zekerheidsstelling voor een derde verbindt.

Vertegenwoordiging.

Artikel 9.

Het bestuur vertegenwoordigt de stichting in en buiten rechte.
De voorzitter en de penningmeester van het bestuur zijn belast met de uitvoering van de besluiten van het bestuur.
Tevens vertegenwoordigen zij gezamenlijk de stichting in en buiten rechte.
In geval van ontstentenis of belet van de voorzitter of de penningmeester wordt de stichting vertegenwoordigd door de voorzitter casu quo de penningmeester en één ander lid van het bestuur.
Bij ontstentenis of belet van zowel de voorzitter als de penningmeester wordt de stichting vertegenwoordigd door twee andere bestuursleden tezamen, of indien slechts één ander bestuurslid in funktie is, door dit bestuurslid alleen.

Bestuursvergadering.

Artikel 10.

Het bestuur vergadert zo dikwijls de voorzitter of degene die hem als' zodanig vervangt, ofwel· tenminste twee bestuursleden dit gewenst achten.
De secretaris roept op tot de vergaderingen.
Hij maakt van het ter vergadering behandelde en beslotene notulen op, die door hem en de voorzitter worden ondertekend.
Fungeert de secretaris als voorzitter, dan geschiedt het notuleren door de penningmeester.
Ieder lid van het bestuur heeft recht op een door de secretaris· uit te reiken en door

hem te ondertekenen kopie van de notulen.
Ieder bestuurslid heeft het recht een onderwerp op de agenda te doen plaatsen, ook-staande de vergadering.

Artikel 11.

Tenzij in deze statuten anders wordt bepaald, worden besluiten met concensus genomen.

Statutenwijziging en ontbinding.

Artikel 12.

1. Het bestuur is bevoegd de statuten te wijzigen of de stichting te ontbinden. Het besluit daartoe zal slechts kunnen worden genomen door middel van concensus.
2. De wijziging moet op straffe van nietigheid bij notariële akte tot stand komen. De bestuurders zijn verplicht een authentiek afschrift der akte van-wijziging, alsmede de gewijzigde statuten neer te leggen ten kantore van het openbaar stichtingenregister, gehouden door de Kamer van Koophandel en Fabrieken binnen wiens gebied de stichting statutair gevestigd is.

Vereffening.

Artikel 13.

1. De vereffening geschiedt door het bestuur.
2. De stichting blijft na haar vereffening voortbestaan indien en voor zover dit voor de vereffening van haar zaken nodig zal zijn.
3. Gedurende de vereffening blijven de bepalingen van de statuten voor zoveel mogelijk in kracht.
4. Na betaling van alle schulden kan de bestemming van de overgebleven bezittingen van de stichting niet anders zijn dan voor een instelling van algemeen-nut als bedoeld in artikel 24 lid 4 van de Successiewet 1956.

Werkgroepen.

Artikel 14.

1. Het bestuur kan wekgroepen instellen voor het uitoefenen van bepaalde taken.
2. Samenstelling, benoeming, taken en bevoegdheden van de werkgroepen worden-door het bestuur bepaald.

Reglement.

Artikel 15.

Het bestuur kan één of meer reglementen vaststellen, wijzigen, of intrekken, welk reglementen geen bepalingen mogen bevatten die met de wet of de statuten strijdig zijn.

Slotbepaling.

Artikel 16.

In alle gevallen waarin het door de statuten noch door de reglementen *is* voorzien beslist het bestuur.

EUROPEAN COMMISSION

Brussels 26.7.2024
C(2024) 5503 final

In the published version of this decision, some information has been omitted, pursuant to articles 30 and 31 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus […]		PUBLIC VERSION This document is made available for information purposes only.

Subject: **State Aid SA.103925 (former SA.103925 (2022/PN) and SA.103926 (2022/PN)) – The Netherlands – PALLAS project: Aid for the construction of a research reactor and of an isotope processing facility in Petten**

Excellency,

1. PROCEDURE

(1) On 26 June 2024, following pre-notification discussions initiated in April 2022, the Dutch Authorities officially notified to the European Commission a set of measures in support of the PALLAS project.

(2) By letter of 26 June 2024, submitted with the notification, the Netherlands exceptionally agreed to waive its right deriving from Article 342 TFEU, in conjunction with Article 3 of Regulation No 1/1958 ([1]), to have the decision adopted and notified in Dutch, and accepted to have this Decision adopted and notified in English.

([1]) Regulation No 1 determining the languages to be used by the European Economic Community, OJ 17, 6.10.1958, p. 385.

Mr. Caspar Veldkamp
Minister of Foreign Affairs
Rijnstraat 8, 2500 EB The Hague
The Netherlands

2. FACTS

2.1. The PALLAS project as part of the PALLAS programme

(3) The PALLAS programme aims to guarantee the long-term security of supply of medical radioisotopes ([2]) in the Netherlands, Europe and the world. To this end, the PALLAS programme comprises three initiatives: 1) the replacement of the existing High Flux Reactor by a new reactor (the future PALLAS reactor), 2) the construction of the Nuclear Health Centre, and 3) innovation in the already existing FIELD-LAB.

(4) The measures notified by the Netherlands on 26 June 2024 are aimed at supporting only the first two out of the three initiatives included in the PALLAS programme. In the present Decision, the Commission refers to the first two initiatives of the PALLAS programme as "the PALLAS project". The PALLAS project therefore consists in the construction of the PALLAS reactor and of the Nuclear Health Centre ("NHC"). Both the PALLAS reactor and the Nuclear Health Centre will be built and operated by a newly incorporated company, provisionally called "NewCo".

(5) The PALLAS reactor will replace the existing High Flux Reactor (HFR) ([3]), which is one of the world leaders in the production of medical isotopes, has been in operation since 1961 and is planned to stop operating when the PALLAS reactor takes over production (expected at the beginning of the 2030s). The PALLAS reactor will be built in the same site where the current HFR is located, namely the Energy & Health Campus in Petten.

(6) The HFR and the future PALLAS reactor are both categorised as "research reactors", with a different purpose and size compared to "nuclear power plants". Nuclear power plants are large installations that generate 500 to 4 000 Mega Watt (MW) of heat, driving turbines for electricity production. By contrast, research reactors are much smaller and are designed to generate a flux of neutrons for various (research) applications. Most research reactors are low power university reactors (1-5 MW) used for education and a myriad of fundamental neutron scattering or activation research activities. The HFR and the future PALLAS reactor, however, operate in a different segment and are among a dozen research reactors with power levels (10-100 MW) high enough for a sufficient neutron flux to produce isotopes in large quantities, and to conduct fuel and materials research for nuclear power technology. The PALLAS reactor will have a power level of 25 MW, while the HFR operates at 45 MW.

([2]) A radioisotope (or radioactive isotope), also known as a radionuclide (or radioactive nuclide), is any of several species of the same chemical element with different masses, whose nuclei are unstable and dissipate excess energy by spontaneously emitting radiation in the form of alpha, beta, and gamma rays. Radioisotopes or radionuclides are also referred to more simply as isotopes or nuclides.

([3]) The HFR is managed by the Institute for Energy and Transport of the Joint Research Centre (JRC) of the European Commission and is operated by the Nuclear Research and consultancy Group (NRG). More particularly: the JRC, as owner of the HFR (for a lease of 99 years), is the plant and budget manager; the NRG operates and maintains the reactor, under contract, for the JRC, and, since 2000, manages the commercial activities of the reactor.

(7) As explained by the Dutch Authorities, the HFR and the future PALLAS reactor are highly versatile in their utilisation and have a relatively high number of full power days. Their flexible core designs allow for simultaneous irradiation of multiple isotopes, with the possibility of online loading at any point during the operating cycle, and various types of experiments. The PALLAS reactor will be outfitted with flexible provisions in the core, vessel and beryllium reflector, providing possible adaptability for future applications to satisfy market needs.

(8) Just like the HFR, the PALLAS reactor will be used for the production of medical and industrial isotopes, as well as for research and other services ([4]) (multipurpose reactor). However, compared to the HFR, the PALLAS reactor will have a stronger focus on the production of medical isotopes.

(9) As regards medical isotopes, the PALLAS reactor will be used to produce isotopes for both diagnostic and therapeutic purposes, including Molybdenum-99 (Mo-99), which is the most important diagnostic isotope, and Lutetium-177 (Lu-177), which is one of the most promising therapeutic isotopes. Therapeutic isotopes are expected to be the most important revenue driver for NewCo, generating on average circa [30-40]% of the company's revenues in the period 2033-2035.

(10) As already mentioned, besides the construction of the new reactor, the PALLAS project includes the construction, in the same Petten campus, of a NHC, which will be an isotope processing facility expected to start operations in 2031. In fact, the production of nuclear medicines by using a reactor (such as the HFR and the future PALLAS reactor) comprises three main steps, as follows:

a) In the first step ("irradiation"), suitable materials, so-called "targets", are irradiated in the reactor. This results in the creation of radioactive isotopes in the target.

b) In the second step ("processing"), chemical processes are carried out to separate (or extract) a given isotope from the irradiated target. This results in the separated isotope being made available as a radiochemical.

c) In the third step ("labelling"), the radiochemical containing the separated isotope is further processed in order to link the isotope to an appropriate ligand. This third step results in a radiopharmaceutical that can be administered to patients.

The NHC will be used to carry out the processing step described under b). The NHC will be a generic (non-specific) facility (matching the generic PALLAS reactor), whose technical specifications allow the processing of a variety of isotopes that are known or expected to have medical applications.

(11) More precisely, in the PALLAS project the targets irradiated in the PALLAS reactor will be processed as follows:

([4]) These are services related among others to target sourcing, container management, the dismantling of radioactively contaminated installations and the management of (historic) radioactive waste.

- As regards diagnostic isotopes (such as Mo-99), the targets irradiated in the PALLAS reactor will be processed in the already existing Molybdenum Processing Facility (MPF), which is located in Petten and is currently used to extract diagnostic isotopes from targets irradiated in the HFR. It must be observed that the MPF currently processes not only targets irradiated in the HFR, but also targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland. The same will happen when the HFR is replaced by the PALLAS reactor: the MPF will process not only targets irradiated in the PALLAS reactor, but also targets irradiated in other reactors. In addition, just like the current HFR, the PALLAS reactor will supply irradiated targets for the production of diagnostic radiochemicals not only to the MPF, but also to other processing facilities (such as IRE in Belgium ([5])).

- As regards therapeutic isotopes (such as Lu-177), the targets irradiated in the PALLAS reactor will be processed in the yet to be built NHC ([6]). The NHC will process not only targets irradiated in the PALLAS reactor, but also targets irradiated in other reactors. In addition, the PALLAS reactor will supply irradiated targets for the production of therapeutic radiochemicals not only to the NHC, but also to other processing facilities.

The reason why it is necessary to have multiple processing facilities is that, for each combination of a given irradiated target and a corresponding medical isotope (e.g. a Uranium target and Mo-99, or an Ytterbium target and Lu-177), a specific chemical process needs to be designed and engineered in a dedicated facility, requiring significant investments. This means that, for example, the existing MPF can only be used to process irradiated Uranium targets through a chemical process resulting in purified Mo-99. It is not possible – without considerable efforts in engineering, construction and licensing – to use a Mo-99 production line to process a chemically different target to extract another medical isotope. In practice, processing lines are dedicated facilities for a specific chemical process to extract a specific medical isotope from an irradiated target of a specific chemical composition. As a non-specific facility, the NHC will have several generic hot cells, which can be used to set up different processing lines. In this way the NHC can process a variety of isotopes that are known or expected to have medical applications.

(12) The information in recitals (10) and (11) shows that, as regards both diagnostic isotopes (such as Mo-99) and therapeutic isotopes (such as Lu-177), the PALLAS project covers the irradiation step resulting in the creation of radioisotopes (as described in recital (10), point a)) and the processing step resulting in the production of radiochemicals (as described in recital (10), point b)). However, the PALLAS project does not cover the final labelling step (as described in recital

([5]) The Institut National des Radioéléments (IRE) in Fleurus, Belgium, operates a Mo-99 processing facility. The IRE facility and the MPF are the two large-volume Mo-99 processing facilities in Europe.

([6]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

(10), point c)) whereby radiochemicals are made into radiopharmaceuticals that can be administered to patients ([7]).

(13) In addition to being used for the irradiation and processing of medical isotopes, the PALLAS reactor and the NHC will be used to carry out research in the fields of nuclear medicine and nuclear energy, as well as to provide services related among others to target sourcing, container management, the dismantling of radioactively contaminated installations and the management of (historic) radioactive waste.

(14) The PALLAS project has undergone several environmental impact assessments within the procedures for the issuance of both the conventional and the nuclear permits ([8]). Those assessments, independently reviewed by the Commissie voor de Milieueffectrapportage (Netherlands Commission for Environmental Assessment), have concluded that the environmental impacts of the PALLAS project can be contained by implementing appropriate mitigation measures, in particular in relation to two NATURA 2000 sites in the vicinity of the project. Based on the above conclusion of the environmental impact assessments, several permits have been issued for the PALLAS project between 2018 and 2023, including in particular the following: the Municipal Zoning Amendment licence (2018-2020), the Nature Protection Act licence (2019-2022), the Construction licence (2020-2023), the Water Act licence (2021-2023) and the Nuclear Energy Act licence (2018-2023). The recommendations of the Commissie voor de Milieueffectrapportage are taken into account during the execution of the PALLAS project.

2.2. The State aid decision adopted by the Commission in 2013

(15) The PALLAS project was already supported by State aid approved by the European Commission in July 2013 ([9]) ("the 2013 Decision").

(16) According to the information available at the time of adoption of the 2013 Decision ([10]), the implementation of the PALLAS project was divided into several phases:

Phase 0 - Preparation, business case (2009-2012),

Phase 1 - Design, tendering, permitting, financing/business case (2013-2017),

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([7]) As explained by the Dutch Authorities, PALLAS will not be an active player in the field of labelling. In fact, while the NHC will be able to provide the infrastructure for the labelling step (resulting in radiopharmaceuticals that can be administered to patients), this will only happen on a small scale for the purpose of R&D&I activities (for instance, the production of small batches that can be used for clinical trials). In the long term, it can be that pharmaceutical companies will rent the NHC labelling infrastructure or ask PALLAS to do the labelling on their behalf based on an intellectual property licence.

([8]) The PALLAS environmental assessments are documented on the website of the Commissie voor de Milieueffectrapportage (Netherlands Commission for Environmental Assessment) Zoeken - Commissiemer.nl. The Commissie voor de Milieueffectrapportage is the body responsible under Dutch law to independently review the environmental impact assessment of projects.

([9]) Commission decision C(2013) 4414 final of 17.7.2013 in case SA.36653 (2013/N) PALLAS - Aid for a new research reactor in Petten (Netherlands), Official Journal 10.9.2013 (C/261/2013).

([10]) See recital 4 of the 2013 Decision.

Phase 2 - Construction (2017-2022),

Phase 3 - Operation (2023 - at least 2063).

(17) As explained in recitals 6 to 11 of the 2013 Decision:

- PALLAS was originally an initiative of the Nuclear Research and consultancy Group (NRG), the operator of the HFR and a subsidiary of the Energy Research Centre of the Netherlands (ECN) ([11]). PALLAS was supposed to be a private initiative to be realised under market conditions. ECN-NRG attempted to find private financing for the project via a public tender for the development and construction of the reactor. However, they did not succeed in attracting sufficient private financing.

- Following that unsuccessful attempt to find private financing, in 2012 the Dutch Government commissioned an independent economic consultant, Booz & co., to review the business case for PALLAS. That review confirmed that the construction of a new nuclear reactor is too risky for private investors: in particular, the outcome of the permitting process could be that the eventual nuclear regulations (such as specific safety requirements) are such that the construction of the reactor would not be commercially viable. In addition, due to specific historical reasons, the current prices of radioisotopes do not cover the full costs of their production, thereby making the commercial viability of a new radioisotopes reactor even more uncertain. The future situation on the medical radioisotopes market will depend on the results of EU and OECD ([12]) initiatives which aim at finding a commercially sustainable economic model for the sector.

(18) As shown in recitals 12 to 17 of the 2013 Decision, given the public interest of PALLAS, the Dutch Government decided to support the project with public funding to cover the total expected expenditure in Phase 1. The public funding would be provided to the beneficiary in the form of two loans under identical conditions: one from the central government (EUR 40 million) and one from the regional government of Noord-Holland (EUR 40 million). The public investment would be paid back before or during the operation of the reactor, together with an interest. The beneficiary of the aid would be a newly created non-profit Foundation. The objective of the Foundation would be to define the design of the reactor, to execute the tendering and licensing processes and to attract private financing for Phase 2 (construction) and Phase 3 (operation). Once private investors would step in for Phases 2 and 3, the Foundation would be converted into a private enterprise and taken over by the private investors. The Dutch Government would step out of the project by the end of Phase 1.

([11]) The NRG is a general partnership under Dutch law (vennootschap onder firmas) composed of the two Foundations Stichting NRG and Stichting ECN-nucleair. Both Foundations hold, as members of the general partnership, the licence (under the Nuclear Energy Act) to operate the High Flux Reactor. The two Foundations are not controlled by the Dutch State or any other public body (there are no government officials sitting on the boards and supervisory boards of the two Foundations). Under article 3 of its Articles of Association, the NRG pursues the following activities: the provision of safe and reliable isotope production to fulfil societal needs; the provision of high quality independent nuclear research and innovation; the provision of services to companies working with nuclear technology; the provision of services for the decommissioning and management of radioactive contaminated installations and waste.

([12]) Organisation for Economic Co-operation and Development.

(19) For the reasons presented in recitals 42 to 81 of the 2013 Decision, the Commission concluded that the planned loans in favour of the PALLAS project were State aid compatible with the internal market under Article 107(3)(c) of the Treaty on the Functioning of the European Union (TFEU).

2.3. Description of the notified measures

(20) In December 2013, the Dutch Authorities established the Stichting Voorbereiding PALLAS reactor (Foundation for the preparation of the PALLAS reactor; the "PALLAS Foundation") ([13]). The PALLAS Foundation was tasked to carry out Phase 1 of the project and to find private investors that would step in for Phases 2 and 3. To carry out the above tasks, in 2014 the PALLAS Foundation received the two loans, amounting to a total of EUR 80 million, approved by the Commission in the 2013 Decision. These loans bear a 1.5% interest rate and should be reimbursed by 31 December 2025.

(21) The PALLAS Foundation's attempts to find private investors that would step in for Phases 2 and 3 have been unsuccessful. In fact, it has turned out that private investors would accept to take the investment risks, only provided that the Dutch Authorities issue far-reaching guarantees. However, if the Dutch Authorities issued such far-reaching guarantees, this would lead to a situation where private parties would have control of the company (into which the PALLAS Foundation would be converted at the end of Phase 1), while substantial risks would remain with the public authorities. In 2020, the conclusion was reached that this would be an unacceptable situation and position for the Dutch Government ([14]). As a result, the latter has made a new plan, under which public funds will be granted to implement, not only Phase 1 of the project, but also Phase 2, i.e. to build the PALLAS reactor and the NHC (the "new plan").

(22) In the meantime, implementation delays have resulted in Phase 1 (design, tendering, licensing) ([15]) being still ongoing at the time of notification. According to the new timeline provided by the Dutch Authorities, Phase 2 (construction) is now planned to start in the second half of 2024, while Phase 3 (operation) should begin in 2031-2033.

(23) Since 2020, and in view of the implementation of the new plan, NRG and the PALLAS Foundation have been collaborating as a single virtual company under the name of NRG|PALLAS, with the intention to merge and form a new company: NewCo. NewCo will be a public limited liability company, whose shares will be (fully) held by the Dutch Authorities. The Dutch Authorities have

([13]) The PALLAS Foundation is not controlled by the Dutch State or any other public body (there are no government officials sitting on the board and supervisory board of the Foundation). Under article 2 of its Articles of Association, the PALLAS Foundation pursues the following activities: the design and construction of a reactor for the production of medical and industrial radioisotopes and for nuclear research in the municipality of Schagen (the PALLAS reactor); the operation of the PALLAS reactor.

([14]) Kamerstukken II 2020/21, 33626, nr. 13.

([15]) More precisely, Phase 1 includes the following: procurement of the general contractor, detailed design of the PALLAS reactor and of the NHC, detailed design and preparation for the construction of the foundation pit, detailed design of the access roads, nuclear and environmental permits, further development of the business case.

explained that the formation and financing of NewCo will only take place after a positive outcome of the State aid assessment by the Commission.

(24) In the years 2019-2024, the Dutch Authorities granted to the PALLAS Foundation further loans (in addition to the EUR 80 million loan approved by the Commission in 2013) that are not covered by the 2013 Decision and that were not notified to the Commission prior to their being granted (the "already granted loans not covered by the 2013 Decision").

(25) By their letter of 26 June 2024, the Dutch Authorities notified both A) the already granted loans not covered by the 2013 Decision and B) the funding of NewCo.

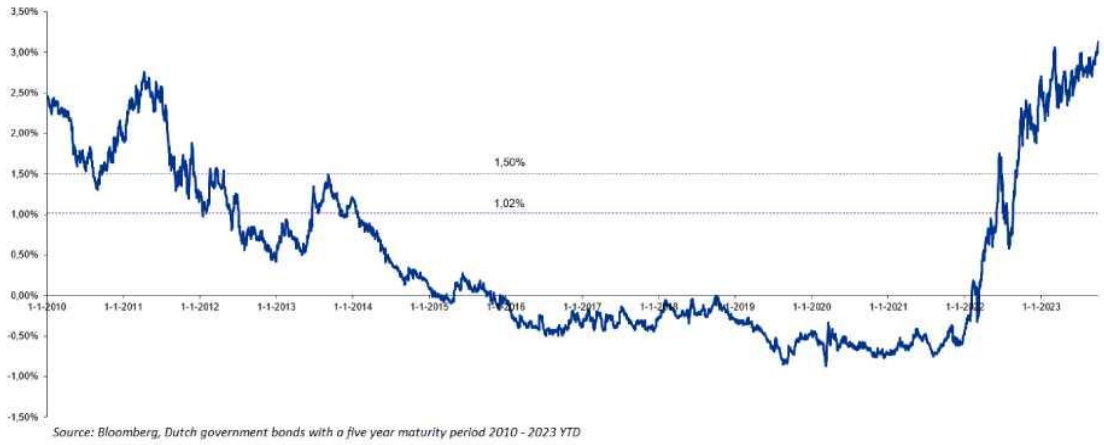
A) The already granted loans not covered by the 2013 Decision

(26) According to the information submitted by the Dutch Authorities, the loans granted by the Dutch Government to the PALLAS Foundation ([16]) in the period 2019-2024 amount to a total of EUR 425.7 million, as follows: 40 million in 2019, 46 million in 2020, 30 million in 2021, 60 million in 2022, 148.7 million in 2023, 59 million in March 2024 and 42 million in June 2024.

(27) In addition, it is expected that, in the remainder of 2024 and until the incorporation of NewCo, the Dutch Government could grant to the PALLAS Foundation a further financing of EUR 44 million, which would result in the total amount of the loans granted to the PALLAS Foundation equalling EUR 469.7 million.

(28) All these loans, like the loans approved by the 2013 Decision, bear a 1.5% interest rate and should be reimbursed by 31 December 2025. As explained by the Dutch Authorities, this rate was set at 1.5% based on the government lending rate of 1.02% plus a mark-up of 0.48% at the time of the 2013 Decision. This concerns the yield on Dutch Government bonds with a five-year maturity, in line with the initial duration of the 2013 loans granted by the Ministry of Economic Affairs and the Region of Noord-Holland. The graph below shows that the yield was well below 1.02% between 2014 and mid-2022, while since the second half of 2022 the yield has increased in line with the overall uplift in interest rate observed in the market.

([16]) It should be noted that the loans have been provided to the PALLAS Foundation, as NRG|PALLAS is not a legal entity but the name of the single virtual company under which NRG and the PALLAS Foundation have been working together through a personnel union since 2020.



Source: Bloomberg, Dutch government bonds with a five year maturity period 2010 - 2023 YTD

(29) As already mentioned, all these loans were granted in addition to the EUR 80 million loan approved by the 2013 Decision, are not covered by that Decision and were not notified to the Commission prior to their being granted.

(30) The Dutch Authorities explained that these additional loans have been granted to complete Phase 1. In fact, the completion of Phase 1 has taken longer than initially foreseen, both because of implementation hurdles ([17]) and because the unavailability of private investors has led to changes compared to the 2013 plan, which has resulted in the need to cover the operational costs of the PALLAS Foundation until the Dutch Government definitively decides to set up NewCo and implement the new plan, under which public funds will be granted to implement, not only Phase 1 (design, tendering and licensing of the project), but also Phase 2 (construction of the project).

B) The funding of NewCo

(31) According to the Dutch Authorities, the public funding of NewCo will comprise the following:

1) Circa EUR [1 400-2 000] million, consisting of a combination of equity ([40-80]%) and long-term debt ([20-60]%) as follows:

a) Circa EUR [30-60] million of unconditional equity to capitalise NewCo at incorporation. This amount of unconditional equity is necessary to ensure NewCo has a sufficient level of working capital, also taking account of minimum liquidity levels required by law. The Dutch Authorities pointed out that the exact amount will be determined on the basis of the actual opening balance sheet of NewCo and of the then applicable budget for the following year.

b) EUR [800-1 100] million of conditional equity specifically and exclusively earmarked for the PALLAS project, i.e. to build the PALLAS

([17]) As explained by the Dutch Authorities, Phase 1 has proved to be more complex than expected. For example, the need to mitigate the project's impact on nature protection areas (NATURA 2000), the Dutch nuclear safety requirements, the procurement procedures and the risk aversion of the construction companies have all contributed to Phase 1 taking longer than initially planned.

reactor and the NHC. This conditional equity will be provided in quarterly tranches.

c) EUR [400-800] million of long-term debt specifically and exclusively earmarked for the PALLAS project. This long-term debt will be provided in quarterly tranches. During the construction period of the PALLAS reactor, a higher interest rate (based on the Commission Communication 2008/C 14/02 ([18])) will apply assuming an interest margin of [200-600] bps above EURIBOR ([19]) during construction. Two years after the PALLAS reactor has become operational ("operating date of the PALLAS reactor"), the interest rate will be lowered, to reflect the decreased risk profile of NewCo. This lowered interest rate (which will also be based on the Commission Communication 2008/C 14/02) will not be lower than [50-200] bps (assuming a credit rating of [AAA-CCC] and a […] level of security/collateral). Interest will be accrued until two years after the operating date of the PALLAS reactor, from which point quarterly interest payments are assumed. Repayment of the principal plus accrued interest will happen linearly in 30 years, starting from two years after the operating date of the PALLAS reactor, which is currently envisaged in 2031-2033. This means that full repayment will be completed around 2063. However, the Dutch Government will impose the following obligations: i) NewCo shall allocate all excess cash flows to debt repayment ("cash sweep mechanism") and ii) NewCo shall not distribute any dividends before the debt, including accrued interest, is fully repaid. Given obligations i) and ii), the Dutch Government expects that the debt will be fully repaid around 2049.

2) A refinancing of all existing loans of the PALLAS Foundation, whose maturity will be extended beyond 31 December 2025 until two years after the operating date of the PALLAS reactor. This refinancing concerns all the loans granted to the PALLAS Foundation until the present day, i.e. both the loans authorised by the 2013 Decision and the already granted loans that are not covered by the 2013 Decision indicated in recitals (26) to (27). The reimbursement of these extended loans will take place under the same conditions as the ones foreseen for the EUR [400-800] million long term debt mentioned above: repayment of the principal plus accrued interest will happen linearly in 30 years, as from two years after the operating date of the PALLAS reactor, which is currently envisaged in 2031-2033, meaning that full repayment will be completed around 2063; however, given the obligations imposed on NewCo (i.e. the cash sweep mechanism and the prohibition to distribute dividends before the debt is fully reimbursed), the Dutch Government expects that the loans will be fully repaid around 2049 ([20]). The

([18]) Communication from the Commission on the revision of the method for setting the reference and discount rates, OJ C 14, 19.1.2008, p. 6-9.

([19]) The Euribor rates are considered to be the most important reference rates in the European money market. Those interest rates provide the basis for the price and interest rates of all kinds of financial products like interest rate swaps, interest rate futures, saving accounts and mortgages. The 5 EURIBOR rates have not fluctuated much recently despite their different maturities (e.g., EURIBOR-1 week stood at 3.597 % and the EURIBOR-12 months at 3.503% on 18 July 2024).

([20]) However, as explained by the Dutch Authorities, the EUR 40 million loan granted by the Region of Noord-Holland has been extended with a final maturity date of 1 April 2035.

extended loans will keep the same interest rate they currently have (i.e. 1.5%). The same loan extension and repayment schedule will also apply to any further loans granted to the PALLAS Foundation until NewCo is set up.

(32) The Dutch Government has made it clear that no State aid is planned to support the operation of NewCo once the PALLAS reactor starts commercial production. The PALLAS reactor will start commercial production when, following the completion of the construction works of the reactor and its commissioning, a ramp-up phase of circa two years will have ended during which production is gradually transferred from the HFR to the PALLAS reactor. Therefore, the notified measures aim at financing the construction of the PALLAS reactor and of the NHC, but not their operation.

(33) The legal basis of the notified measures under Dutch law is the Comptabiliteitswet 2016 (Accounts Act 2016). The funds for the loans and the financing of NewCo come from the Dutch Treasury.

(34) As regards the transparency of the aid, the Dutch Authorities commit to publish on the website State Aid Transparency Public Search (europa.eu) the following information: the full text of the individual aid granting decision and its implementing provisions, or a link to it; the identity of the granting authorities; the identity of the individual beneficiary, the aid instrument and amount of aid granted to the beneficiary; the objective of the aid, the date of granting, the type of undertaking (for example SME, large company); the Commission's aid measure reference number; the region where the beneficiary is located (at NUTS level 2) and the principal economic sector of the beneficiary (at NACE group level).

2.4. The market for medical radioisotopes

(35) Radioisotopes are used in medicine to diagnose and treat various diseases, including life-threatening ones like cancer or cardiovascular and brain diseases. Over 10 000 hospitals worldwide use radioisotopes in about 100 different nuclear medicine procedures totalling almost 49 million medical exams each year. In the EU alone, more than 1 500 nuclear medicine centres deliver about 10 million procedures to patients each year ([21]).

(36) The therapeutic use of radioisotopes in cancer therapy is increasingly expanding, with a forecasted massive growth of the market for novel therapeutic radiopharmaceuticals in the 2020s ([22]). Currently, Lutetium-177 (Lu-177) is one of the most promising isotopes for cancer therapy. Lu-177 is mostly produced by irradiating either Lutetium-176 (Lu-176) or Ytterbium-176 (Yb-176) in nuclear research reactors ([23]). The irradiation phase is followed by a processing phase,

([21]) Study on sustainable and resilient supply of medical radioisotopes in the EU (JRC/BRU/2017/A.7/0001/0C).

([22]) Radiotherapeutics, which represented 20% of the global nuclear medicine market in 2021, are expected to reach ~70% by 2031 (MEDraysintell Nuclear Medicine Edition 2022, http://medraysintell.com/).

([23]) The production process based on the irradiation of Lu-176 results in the so-called carrier-added Lu-177, which is mainly used to treat neuroendocrine tumours. On the other hand, the production process

where the irradiated target (either Lu-176 or Yb-176) is subjected to chemical processes to extract the Lu-177, which, after having undergone further chemical processes aimed at linking it to an appropriate ligand, can be delivered to hospitals for the treatment of patients.

(37) However, most of the nuclear medicine procedures today are for diagnosis, with Technetium-99m (Tc-99m) being the most widely used diagnostic isotope (in 80% of all radiodiagnostic procedures). Tc-99m demand is expected to rise worldwide due to ageing populations in Europe and North America and to growing use in emerging economies. Tc-99m is mostly produced by using a process which includes the irradiation of Uranium targets in nuclear research reactors to produce Molybdenum-99 (Mo-99), the extraction of Mo-99 from the targets in specialised processing facilities and the production of Mo-99/Tc-99m generators, which are then shipped to hospitals where patient doses are extracted from the generators ([24]). Due to their short decay times, Mo-99 and Tc-99m cannot be stockpiled and must be produced continuously and delivered to hospitals weekly. Any supply disruption can lead to a situation where crucial diagnostic imaging tests must be cancelled or postponed, with negative and sometimes life-threatening consequences for patients.

(38) Medical isotopes are mainly produced by using either cyclotrons, or nuclear power reactors, or nuclear research reactors. Nuclear research reactors, such as the HFR and its planned replacement PALLAS, are multipurpose installations where both production of medical isotopes and research in nuclear technology are carried out; nuclear power reactors are primarily used for energy production but can allocate some of their capacity to produce medical isotopes ([25]); cyclotrons are particle accelerators used to produce medical isotopes ([26]).

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based on the irradiation of Yb-176 results in non-carrier-added Lu-177, which is mainly used to treat prostate cancer.

([24]) A Mo-99/Tc-99m generator is a device used to extract Tc-99m from a sample of Mo-99. The generator comprises a column packed with alumina, where Mo-99 is adsorbed. As Mo-99 decays, it produces Tc-99m, which is eluted (or "milked") from the generator using a saline solution. The elution of the patient doses from the generator is carried out by the hospitals.

([25]) As explained by the NucAdvisor study published in 2021, "Using power reactors, particularly CANDU reactors, is an interesting way to produce isotopes, but not all the operators are ready to take the risk of perturbing their primary power production in case of potential malfunctions of the isotopes production. In addition, only 2 CANDU reactors exist in Europe, operated by Nuclearelectrica in Romania, which currently does not plan to produce other isotopes than ^{60}Co" (Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com), p. 154).

([26]) Typically, reactor-based medical isotopes are neutron-rich isotopes commonly characterised by a long half-life, while accelerator-based medical isotopes tend to offer a shorter half-life and usually emit positrons or γ rays (Production Review of Accelerator-Based Medical Isotopes - PMC (nih.gov)). Both cyclotrons and reactors are necessary, because some isotopes can only be produced by using cyclotrons (I. Cyclotron-produced Isotopes in Clinical and Experimental Medicine | British Journal of Radiology | Oxford Academic (oup.com)), while some other isotopes can only be produced by using reactors (Technopolis+Group+Medical+isotope+production+using+local+cyclotrons+2022 (1).pdf: "Cyclotrons are primarily suitable to produce PET isotopes and cannot produce various (esp. therapeutic) isotopes that are important from a medical perspective. For this a nuclear reactor remains necessary."; Radioisotopes in Medicine | Nuclear Medicine - World Nuclear Association (world-nuclear.org): " […] the main radioisotopes such as Tc-99m cannot effectively be produced without reactors.** Some Tc-99m is produced in accelerators but it is of lower quality and at higher cost.").

(39) Most medical isotopes are produced by using nuclear research reactors financed by governments. More in particular, a limited number of such reactors currently provide about 95% of the world's Mo-99 production: the HFR in the Netherlands, the BR-2 reactor in Belgium, the SAFARI reactor in South Africa, the OPAL reactor in Australia, the MARIA reactor in Poland and the LVR-15 reactor in the Czech Republic. The EU is the worldwide leading supplier of medical radioisotopes with a market share of more than 60% for the main diagnostic isotope Mo-99 ([27]). The HFR serves approximately 30% of the world market for Mo-99, and approximately 70% of the European market.

(40) Most of the abovementioned reactors are approaching the end of their lifespan. In particular, three of the four European reactors (HFR in the Netherlands, BR-2 in Belgium and LVR-15 in the Czech Republic) are expected to be out of operation by 2040, while the MARIA reactor in Poland should stop operations in 2050 ([28]). As a result, they have an increasing need for planned maintenance cycles and a growing frequency of unplanned production interruptions, which affects the global supply of radioisotopes. This is the case for the HFR in the Netherlands, which commenced operations in 1961 and is planned to close in the early 2030s.

(41) In the medical isotopes industry, it is therefore important to maintain an irradiation capacity that exceeds demand. In fact, the small number and the age of the existing research reactors capable of producing Mo-99 have jeopardised the security of supply of this crucial isotope. In 2008-2010, there were periods of global scarcity of medical radioisotopes due to the fact that several research reactors had to be unexpectedly shut down for maintenance. Further unexpected shutdowns have occurred more recently, although not to the same extent as in 2008-2010. The most recent disruption in the global supply of Mo-99 occurred in November 2022, when the LVR-15 and HFR reactors were undergoing planned maintenance, while the BR-2 reactor experienced a technical failure ([29]). This is why, to assess whether there is sufficient capacity in the industry, the OECD Nuclear Energy Agency (OECD-NEA) includes an outage reserve capacity (ORC) in its demand estimates. This refers to the capacity that is estimated to be needed to cover demand in case unexpected disruptions occur. In its latest reports, the OECD-NEA has recommended a 35% ORC ([30]).

([27]) "European study on medical, industrial and research applications of nuclear and radiation technology" published by the European Commission in 2019 (https://data.europa.eu/doi/10.2833/511137).

([28]) In June 2023, the Polish Government announced that the MARIA reactor will be refurbished so as to prolong its operation until 2050.

([29]) As explained in the October 2023 OECD-NEA report Nuclear Energy Agency (NEA) - The Security of Supply of Medical Radioisotopes: Demand and Capacity Projections for 99Mo/99mTc for the 2023-2027 Period (oecd-nea.org), "In late 2022, a combination of extended planned maintenance and unplanned outages led to significant global shortages of ^{99}Mo and reactor-based therapy isotopes. A single reactor had been scheduled to operate in the European network, but unplanned outages led to an extended period with no irradiation capacity available from the network. No irradiation capacity in Europe directly blocks significant ^{99}Mo processing capacity, leading to global supply shortages".

([30]) See e.g. Nuclear Energy Agency (NEA) - 2019 Medical Isotope Demand and Capacity Projection for the 2019-2024 Period (oecd-nea.org), p. 7, and Nuclear Energy Agency (NEA) - The Security of Supply of Medical Radioisotopes: Demand and Capacity Projections for 99Mo/99mTc for the 2023-2027 Period (oecd-nea.org), p. 14.

(42) In 2012, the European Commission and stakeholders established the European Observatory on the Supply of Medical Radioisotopes, aimed at bringing together all relevant information to the decision makers in the EU institutions and in national governments so as to assist them in defining and implementing relevant policies ([31]). The Observatory is composed of members from the Euratom Supply Agency, the European Commission, the European Association of Nuclear Medicine and various industry stakeholders. The Observatory has four strategic objectives: (i) to support a secure Mo-99/Tc-99m supply across the EU, (ii) to ensure that the Mo-99/Tc-99m supply issue is given high political visibility, (iii) to encourage the creation of a sustainable economic structure of the supply chain by supporting the implementation of the full cost recovery (FCR) methodology developed by the OECD-NEA, and (iv) to establish periodic reviews of the supply chain and capacities.

(43) According to a 2014 report by the European Observatory on the Supply of Medical Radioisotopes ([32]), the existing European network of research reactors is fundamental to ensure the supply of medical radioisotopes, thereby making it necessary to undertake investments to refurbish the current fleet and to replace the capacity that will be lost as the operating reactors reach the end of their lifespan ([33]).

(44) This finding of the Observatory was confirmed by two 2021 reports prepared for the European Commission, namely the NucAdvisor study ([34]) and the Technopolis study ([35]), both of which concluded that, if the EU's aging production capacity is not replaced in time, the EU will become increasingly dependent on countries outside Europe. In particular, the NucAdvisor study concluded that the construction of at least one new research reactor in Europe is needed to minimise EU reliance on foreign supply concerning all necessary isotopes ([36]).

(45) In February 2021, the Commission presented the SAMIRA action plan ([37]), as part of Europe's Beating Cancer Plan ([38]). Under the SAMIRA action plan, the Commission is to establish a European Radioisotope Valley Initiative to maintain

([31]) See Supply of medical radioisotopes - European Commission (europa.eu).

([32]) WG4_Report.pdf (europa.eu).

([33]) This finding of the Observatory was included in the conclusions of a 2015 report by the Euratom Supply Agency (Activities following up the Council Conclusions of 15 December 2009 on the Security of Supply of Radioisotopes for Medical Use and the Council Conclusions of 6 December 2010 and 7 December 2012 'Towards the Secure Supply of Radioisotopes for Medical Use in the European Union' (europa.eu)).

([34]) Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com).

([35]) Study on sustainable and resilient supply of medical radioisotopes in the EU - Therapeutic Radionuclides (technopolis-group. com).

([36]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([37]) Commission Staff Working Document SWD(2021) 14 final on a Strategic Agenda for Medical Ionising Radiation Applications of 5.2.2021 (SAMIRA: Strategic Agenda for Medical Ionising Radiation Applications (europa.eu)).

([38]) Communication from the Commission to the European Parliament and the Council COM(2021) 44 final on Europe's Beating Cancer Plan of 3.2.2021.

Europe's global leadership in the supply of medical radioisotopes and help accelerate the development and introduction of new radioisotopes and production methods.

(46) Research made by the OECD and the EU indicates that, because of the economics of the sector, the supply of medical radioisotopes is characterised by prices for the irradiation of medical radioisotopes that have been and still are too low for private investors to construct new research reactors on a commercial basis ([39]). This is due to the fact that all the existing reactors that are used to produce medical radioisotopes were originally constructed and operated with 100% government funding, mainly for research and materials-testing purposes. When Mo-99 production started, the capital costs of the reactors had been paid or fully amortised for other purposes. Therefore, Mo-99 was seen as a by-product. This resulted in: (a) the reactor operators originally requiring reimbursement of only direct short-run marginal costs, (b) the Mo-99 process not covering any significant share of the costs for overall reactor operations, maintenance, replacement or refurbishment, (c) no substantive price changes even as the importance of Mo-99 production increased among reactor operating activities.

(47) To remedy the economically unsustainable nature of the production of medical radioisotopes, the OECD has issued several policy recommendations ([40]). These OECD (non-binding) recommendations include the implementation of the principle of full cost recovery (FCR) throughout the supply chain, which is also one of the four strategic objectives of the European Observatory described above. In 2014, several countries, including the Netherlands, signed a Joint Declaration committing to implement the FCR principle and the other OECD recommendations ([41]). However, the success of these initiatives will depend on further developments in the OECD discussions about the FCR principle and, for the time being, the market for medical radioisotopes remains economically unsustainable for purely commercial operations. As concerns specifically FCR, the countries members to the OECD-NEA High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) have not yet reached an agreement on the various cost components to be included in FCR models, nor have they reached an agreement on a model for the allocation of costs to individual products and services.

(48) In addition to the prices for medical radioisotopes still being too low, another reason why private investors are unwilling to build new research reactors for the

([39]) See in particular: The Supply of Medical Radioisotopes An Economic Study of the Molybdenum-99 Supply Chain (oecd-nea.org), OECD-NEA 2010; "The Supply of Radioisotopes - The Path to Reliability", OECD-NEA 2011 (http://www.oecd-nea.org/med-radio/reports/med-radio-reliability.pdf); and "The Supply of Medical Isotopes - An Economic Diagnosis and Possible Solutions", OECD-NEA 2019 (https://www.oecd-nea.org/jcms/pl_15144/the-supply-of-medical-radioisotopes).

([40]) See in particular the six policy principles issued by the High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR), which were formally endorsed by the OECD Steering Committee for Nuclear Energy on 28 April 2011 (Nuclear Energy Agency (NEA) - Statement by the OECD/NEA Steering Committee for Nuclear Energy Regarding Policy Actions Necessary to Ensure the Long term Security of Supply of Medical Radioisotopes (oecd-nea.org)).

([41]) NEA press release - Joint Declaration on the Security of Supply of Medical Radioisotopes (oecd-nea.org).

production of medical isotopes is that such projects, like all nuclear projects, involve long-term investment risks ([42]). The market consultation about nuclear power plants published by KPMG in July 2021 ([43]) shows that, although private investors are willing to take some construction risks, they are not willing to take many of the other risks associated with nuclear projects, notably black swan ([44]), regulatory and licence risks. This is confirmed by the unsuccessfulness of the Dutch Authorities' attempts to find private investors willing to build the PALLAS reactor.

(49) While most medical radioisotopes continue to be produced in nuclear research reactors, alternative technologies are emerging. Such innovative projects include the accelerator-driven subcritical reactor SHINE (USA).

(50) However, as indicated by the NucAdvisor and Technopolis studies, such innovative projects, despite promising extrapolations from laboratory experiments or validation of their individual components, still lack experience feedback of their first full scale industrial production. Until such feedback becomes available, it is not possible to assess in a compelling manner whether these novel technologies will be sufficiently competitive with nuclear research reactors (in terms of costs, production yields, reliability, product quality, etc.), thereby offering a valid industrial alternative ([45]). In particular, the SHINE project differs greatly from the current reactors and is based on innovative technologies, combining in an integrated manner nuclear, reprocessing and chemical processes, that still necessitate demonstration at full industrial scale ([46]). Therefore, the Technopolis study concludes that these alternatives "*provide an innovative, but hardly proven option that requires time to scale up to global demand*" ([47]).

(51) In addition, while a nuclear research reactor can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging

([42]) This is also confirmed in the Commission's State aid decision on the nuclear power plant Hinkley Point C, where a long construction and operating time, and hence a long payback period (of more than 30 years), is mentioned [Commission Decision of 08.10.2014 on the aid measure SA.34947 (2013/C) (ex 2013/N) which the United Kingdom is planning to implement for support to the Hinkley Point C Nuclear Power Station, recital 89]. The Commission's decision on Hinkley Point C was confirmed by judgment of the EU Court of Justice (Grand Chamber) of 22 September 2020 in Case C-594/18 P.

([43]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([44]) The term "black swan" refers to extremely rare and unpredictable events with severe consequences, popularised by Nassim Nicholas Taleb in "The Black Swan" (2007). Key traits include rarity, severe impact, and predictability in hindsight. In nuclear projects, black swan risks involve rare, catastrophic events like nuclear accidents (Chernobyl, Fukushima), sudden regulatory changes, and technological failures. Private investors avoid these risks due to potential financial losses, unpredictability, reputational damage, and complex insurance and liability issues, making them extremely difficult to manage and mitigate.

([45]) NucAdvisor 2021, p. 108.

([46]) NucAdvisor 2021, p. 87, p. 98; Technopolis 2021, p. 58.

([47]) Technopolis 2021, p. 63.

technologies ([48]). Therefore, the production scope of emerging technologies is smaller than the production scope of a nuclear research reactor.

(52) Given the above uncertainties about newer technologies and because, for the time being, research reactors are the only kind of installations that can produce a large variety and quantity of isotopes simultaneously ([49]), the NucAdvisor study concluded that, to reduce the risk of supply shortages and to minimise EU dependence on countries outside Europe, investments should be made in Europe in a mix of technologies that would include (in addition to existing production capacity) a combination of at least one new research reactor and of innovative systems such as the US-based SHINE and the Belgian SMART ([50]).

(53) It is against this background that the Dutch Government has decided to launch and to continue the PALLAS project aimed at replacing the HFR by a new nuclear research reactor.

(54) In addition to the PALLAS project supported by the Dutch Government, other European Governments are investing in new research reactors for the production of medical isotopes. The French Jules Horowitz Reactor (JHR), whose construction should be completed ca. 2030, and the Belgian Multi-purpose hYbrid Research Reactor for High-tech Applications (MYRRHA), which is aimed to replace the BR-2 reactor and whose construction should be completed by 2037, will produce medical isotopes. In Germany, the already operational Forschungsreaktor München II (FRM-II) will undergo design modifications to be able to produce Mo-99. However, since these reactors are primarily aimed at research, their capacity to produce medical isotopes on a large scale is limited by the capacity needs of the research activities. This is why the combined capacity of the JHR, MYRRHA and FRM-II reactors will be insufficient to meet European demand for both diagnostic and therapeutic isotopes ([51]).

3. COMPLAINT FROM A COMPETITOR

(55) On 22 December 2022, the Commission received a complaint by the company SHINE Europe B.V., the European arm of SHINE Technologies LLC ("SHINE" or "the complainant") ([52]). In the course of 2023 and 2024, SHINE sent to the Commission further submissions substantiating its complaint and had several meetings with the Commission services.

(56) SHINE is currently constructing two medical radioisotope production facilities in Janesville, Wisconsin (USA), and plans to build a third one in Veendam, the Netherlands. SHINE aims to produce essential isotopes by using an innovative

([48]) NucAdvisor 2021, p. 153.

([49]) NucAdvisor 2021, p. 153.

([50]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155. The SMART project (also known under the name of Lighthouse), mentioned by NucAdvisor 2021 besides the SHINE project, aimed at developing a photonuclear-based installation for the production of medical isotopes; however, it was demised in March 2023.

([51]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

([52]) SA.105800 | SHINE Complaint against PALLAS State aid.

neutron-generator-based technology, thereby eliminating the need for a nuclear research reactor. More precisely, SHINE is currently being authorised by the US Authorities to produce two diagnostic isotopes, namely Mo-99 and Xenon-133 (Xe-133), and two therapeutic isotopes, namely Iodine-131 (I-131) and Lu-177 ([53]). Therefore, SHINE is a competitor of reactors, such as PALLAS, that produce medical isotopes.

(57) The innovative SHINE technology, which will allow producing medical isotopes without a research reactor, will cover both the irradiation step resulting in the creation of radioisotopes (as described in recital (10), point a)) and the processing step resulting in the production of radiochemicals (as described in recital (10), point b)) ([54]). Therefore, SHINE and PALLAS will compete with each other to sell their respective radiochemicals to pharmaceutical companies that will carry out the labelling step (as described in recital (10), point c)) whereby radiochemicals are made into radiopharmaceuticals that can be administered to patients. In addition, the complainant points out that competition between SHINE and PALLAS will also occur indirectly when the PALLAS reactor will supply irradiated targets to processing facilities for the production of radiochemicals.

(58) SHINE, besides developing its innovative technology allowing to produce medical isotopes without a research reactor, can also rely on research reactors to produce medical isotopes ([55]). However, such a reactor-based production is only a back-up option, because SHINE aims to fully deploy its innovative technology that will not depend on research reactors ([56]). For the time being and as of 2024, SHINE has been producing Lu-177 in the US based on the irradiation capacity of the Missouri University Research Reactor (thereby making use of the back-up option). However, SHINE has not yet started production based on its innovative technology that will not depend on research reactors.

(59) According to information provided by SHINE in a meeting with the Commission services in May 2024, SHINE plans to start commercial production based on its innovative technology (that will not depend on research reactors) in the next few years.

(60) According to the complainant, the Dutch Authorities' aid in favour of the PALLAS project is likely to have significant distortive effects on the markets for essential medical isotopes like Mo-99 and Lu-177, as follows:

a) Reduction of production efficiency: As a result of the subsidised activity of PALLAS, competitors are likely to experience a reduction in demand, which

([53]) As regards SHINE being licensed in the US to produce Mo-99, Xe-133 and I-131, see NucAdvisor 2021, p. 16. As regards SHINE's plans to produce Lu-177, see the 2022 report by the Reactor Instituut Delft ("the Delft report"), available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

([54]) The innovative SHINE technology, while not using the irradiation capacity of a nuclear research reactor, still foresees the irradiation of targets to create radioisotopes (irradiation step) and the production of radiochemicals by separating a given isotope from the irradiated target (processing step).

([55]) See section "13. SHINE processing and distributing of either reactor-based ^{177}Lu, or SHINE-facility produced ^{177}Lu" on page 18 of the Delft report.

([56]) Delft report, page 13.

would lead to an increase in their average costs. The demand would instead be captured by a less efficient undertaking, the aid beneficiary. In fact, it is likely that PALLAS would be less efficient than its competitors due to its need for substantial aid, and as no private financing is available for its development, in comparison with entrants, such as SHINE, that would operate on a commercial basis. As concerns support granted by the US Government to SHINE, the complainant points out that the US Department of Energy (DOE) subsidy programme, under which SHINE has received funds, is a general scheme, open not only to SHINE but also to all other qualifying companies who make competing bids to get access to the public funds. In addition, under the DOE subsidy programme, bidders will only get the public funds if they can find themselves a matching private financing of the same amount.

b) Loss of profits by competitors and entry deterrence: The aid would allow PALLAS to sell below its average production costs, reducing market prices and the margins of existing competitors, which may lead to new, more efficient, competitors staying out of the market. To help mitigating this risk, in SHINE's view, PALLAS has to adhere to full cost recovery (FCR) in the pricing of its products.

c) Reduction of competitors' incentives to innovate: If a State-supported facility introduces additional production capacity (that would not have existed in the absence of the aid), thereby making competitors' production less profitable, private funders are disincentivised from investing in (new) technologies for the creation of isotopes. The aid will thus significantly raise entry barriers to the market, thereby lessening incentives to lower costs in the industry and jeopardising the long-term supply of Mo-99 and Lu-177. In this regard, the complainant states that the Dutch Government's support in favour of PALLAS is the main reason why the SMART project (Belgium) was abandoned in March 2023. The complainant also states that the Dutch Government's support in favour of PALLAS is having a chilling effect on SHINE's investors at a critical time for the construction and scaling of SHINE's production facilities in the USA and in Veendam (the Netherlands). The complainant further alleges that the Dutch Government's support in favour of PALLAS is discouraging customers from entering into agreements for the future delivery of products (take-off contracts) with SHINE, and that this customer reluctance makes it more difficult for SHINE to complete its engagements to build, expand and market radioisotopes. The complainant further refers to its decision in August 2023 to lay off some of its staff in the US, mainly members of the team in charge of developing SHINE's Mo-99 production: according to the complainant, this decision is a direct consequence of the Dutch Government's support in favour of PALLAS, which has pushed SHINE to focus on its objective of producing Lu-177 and to delay its objective of producing Mo-99.

(61) As regards the possible implementation of FCR pricing by the aid beneficiary, mentioned under recital (60) point b), the complainant points out the following:

1) According to the market consultation about nuclear power plants published by KPMG in July 2021 ([57]), market rates for loans aimed at financing a project similar to PALLAS could be over 12% interest per annum. Based on a study made by Oxera for the complainant, the estimate of the overall return that would be required by a hypothetical private investor to finance the PALLAS project ranges between 14.1% and 18.2% (on a nominal basis). However, the Dutch Authorities' loans to the PALLAS Foundation bear a significantly lower interest rate, i.e. 1.5%.

2) By providing State aid in the form of financing at a subsidised cost, the Dutch Government lowers the level of return that PALLAS would have to generate from its activities in order to remunerate its capital. The aided company could therefore set a lower price to comply with the FCR principle, compared to a competitor that faces a higher capital cost (i.e. due to higher interest rate charges).
   This mechanism is particularly clear under the methodology proposed by the OECD-NEA to implement FCR pricing for the irradiation of Mo-99. According to this methodology, the price of Mo-99 irradiation should be at least equal to a so-called 'levelised unit cost' (LCUM), which measures the average net present cost of a unit of Mo-99 (i.e. a 6-day Ci ([58])) for a reactor, over its lifetime. In order to calculate this, it is necessary to use a discount rate to express all costs (i.e. the initial investment costs, ongoing operating costs, etc.) on a comparable basis. A high discount rate would result in initial investment costs having a higher impact on the LCUM. For a private investor, the discount rate to be used should be its (weighted average) cost of capital ([59]). By reducing PALLAS's cost of financing, the Dutch Government therefore lowers the LCUM of PALLAS, i.e. the minimum price that PALLAS could profitably charge.

3) A genuine FCR pricing should cover the following cost items: all start-up costs covering project design, safety analysis, environmental analysis etc; capital costs, expressed in a depreciation schedule covering both the initial infrastructure and the expected refurbishments during the lifespan of the PALLAS reactor; capital financing costs; general costs, including human resource management, financial and accounting services, legal services, IT, government relations, site infrastructure support like roads and grounds, site utilities, site and facilities maintenance; all operational costs, like operation and maintenance staff, reactor fuel, utilities (energy, water, etc.), security; waste management; decommissioning costs. In addition, the complainant considers that a genuine FCR pricing by PALLAS should also ensure the allocation of costs to the irradiation of specific medical isotopes: the percentage of costs to be charged to medical isotope customers should take into account the fraction of thermal neutrons needed for the irradiation of

([57]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([58]) '6-day Ci' stands for the amount of radioactivity remaining in the radioisotope six days after the day of measurement.

([59]) Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union, OJ C 262, 19.7. 2016, par. 102.

those products in relation to the total number of thermal neutrons used for other products and services.

4) It is possible that the Dutch State, which would own and control PALLAS, might decide to pursue public policy objectives rather than operate the facility in a profitable manner according to market mechanisms. Potential competitors contemplating entry in the market might be particularly deterred from doing so if they expect that PALLAS could operate in a way that would not comply with the FCR principle. The Dutch Government has alternated between indicating that PALLAS would operate based on FCR or based on 'market prices'. The notion of 'market prices' is vague and could leave the door open to pricing below FCR-compliant levels, if other competitors are able to compete at lower prices than PALLAS's FCR-compliant level (even when taking into account the lower, aided financing cost of PALLAS).

For these reasons, the complainant considers that, in order to mitigate the aid's distortions of competition, PALLAS should be required to charge not just 'market prices', but genuine FCR-compliant prices as described under points 2) and 3) above. The complainant also considers that an independent auditor should be appointed to annually check PALLAS' accounts in order to ensure that PALLAS actually complies with the necessary FCR pricing.

(62) Based on a study commissioned by the complainant, the latter considers that, in light of the existing plans for the construction of additional capacity in Europe and in the world, there will be sufficient Mo-99 production capacity to cover the estimated worldwide demand (including the recommended outage reserve capacity), even without the PALLAS reactor. Although this is conditional on planned capacity from additional projects coming online as expected, the complainant considers that, even if some of the new projects were delayed, there is the potential to prolong the operation of some of the reactors that are currently planned to be decommissioned. Based on its opinion that there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant holds that the State aid in favour of the PALLAS project may not be justified by the need to remedy a market failure. The complainant further considers that, even assuming that State aid in favour of the PALLAS reactor (the main element of the PALLAS project) may be justified by the need to remedy a market failure, such a market failure certainly does not exist as regards a processing facility providing pre- or post-irradiation services like the Nuclear Health Centre (the other element of the PALLAS project), because a facility like the Nuclear Health Centre (as opposed to a reactor) can be built without major technical and financial difficulties. Therefore, in the complainant's view, any State aid to the PALLAS reactor should not be extended to the Nuclear Health Centre.

(63) In order to substantiate its claim that PALLAS is not required to address a market failure because there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant further refers to the report of a 4 December 2020 meeting of the NRG PALLAS Steering Committee ([60]),

([60]) The NRG PALLAS Steering Committee (Stuurgroep Pallas NRG) is made up of representatives of the Ministry of Health, Welfare and Sport (ministerie van Volksgezondheid, Welzijn en Sport – VWS)

which contains the following text: "*5.i.2e asks a question in response to the image on page 8 of the presentation - the graph shows the development of supply and demand for Mo-99 in Europe, which, in addition to the development of existing capacity, also includes the capacity of the three most important new initiatives. Can it be concluded from this that if one of the initiatives goes ahead, self-sufficiency (in Europe) will be in order? 5.i.2e indicates that this image shows more overlap between SHINE and Pallas than he previously assumed. This is a crucial point, also for the public variant. How does KPMG estimate SHINE's chances of success? How indispensable is the Pallas reactor if SHINE succeeds? 5.i.2e indicates that Pallas is not indispensable.*" ([61]). According to the complainant, this text shows that since 2020 the Dutch Authorities have been aware that the implementation of the SHINE technology would make PALLAS not indispensable and, therefore, that PALLAS is not needed to ensure security of supply and Europe's self-sufficiency as regards the main diagnostic isotope Mo-99.

(64) The complainant further submits that, besides being unnecessary to ensure security of supply and Europe's self-sufficiency as regards the main diagnostic isotope Mo-99, PALLAS is equally unnecessary to ensure security of supply and Europe's self-sufficiency as regards the main therapeutic isotope Lu-177. In this regard, the complainant refers to the 2022 report "Production of ^{177}Lu using the SHINE technology" made by the University of Delft at the request of the Dutch Ministry of Health ([62]). According to the complainant, this report concluded that the planned SHINE production of Lu-177 is sufficient to supply the global market, thereby confirming that PALLAS is not required to address a market failure.

(65) In addition, as regards the production of Lu-177, the complainant states that SHINE can and will produce Lu-177 without using Ytterbium-176 (Yb-176) sourced in Russia, whereas the HFR produces Lu-177 by using Yb-176 sourced in Russia and the PALLAS reactor (as the successor of the HFR) will probably do the same. Therefore, the complainant considers that, despite allegations by the Dutch Authorities that the PALLAS project is necessary for the strategic

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and of the Ministry of Economic Affairs and Climate (ministerie van Economische Zaken en Klimaat – EZK).

([61]) The report of the 4 December 2020 meeting of the NRG PALLAS Steering Committee makes part of a set of documents released by the Ministry of Health in March 2024 in response to a request for access to information. All these documents are available at Besluit op Woo-verzoek over financiering PALLAS-Project | Woo-besluit | Rijksoverheid.nl. More precisely, the report of the 4 December 2020 meeting of the NRG PALLAS Steering Committee can be read on pages 65 to 69 of the "Documents part 4" available at Documenten deel 4 bij besluit op Woo-verzoek over financiering PALLAS-Project | Publicatie | Rijksoverheid.nl. The passage of this meeting report to which the complainant refers reads as follows in the original Dutch: "*5.i.2e stelt een vraag n.a.v. de afbeelding op pagina 8 van de presentatie - de grafiek geeft de ontwikkeling van vraag en aanbod weer voor Mo-99 in Europa waarbij naast de ontwikkeling van de bestaande capaciteit tevens de capaciteit van de drie belangrijkste nieuwe initiatieven is opgenomen. Kan hieruit worden opgemaakt dat als één van de initiatieven doorgaat, de zelfvoorzienendheid (in Europa) op orde is? 5.i.2e geeft aan dat deze afbeelding meer overlap laat zien tussen SHINE en Pallas dan dat hij tot dusver aannam. Dit is een cruciaal punt, ook voor de publieke variant. Hoe schat KPMG de kansrijkheid van SHINE in? Hoe onmisbaar is de Pallas-reactor als SHINE doorgaat? 5.i.2e geeft aan dat Pallas niet onmisbaar is.*"

([62]) This report by the Reactor Instituut Delft of the University of Delft is available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

autonomy of Europe, the production of Lu-177 by the PALLAS reactor risks prolonging Europe's strategic dependency on Russia as regards the sourcing of Yb-176.

(66) Furthermore, in the complainant's view, the aid does not achieve an objective of common interest because the market is already ensuring the production of key medical isotopes in the EU even without any State support for the construction of facilities. SHINE is a prime example of such a market provider and will also be based in the Netherlands with its facility in Veendam. In this regard, the complainant mentions the opinion of June 2023 whereby the Dutch National Growth Fund advised the Dutch Government not to use that Fund's budget to finance the PALLAS project. The complainant points out that this opinion is based on the Fund's finding that the PALLAS reactor, while being very important for the Netherlands and the EU from a strategic and social perspective, would not contribute to the earning capacity and innovation objectives pursued by the Fund ([63]).

(67) Finally, the complainant considers that, to the extent that PALLAS would also carry out other activities than the production of commercial isotopes (e.g. research and development), the aid is not an appropriate instrument to support these activities. Indeed, the creation of market distortions by enabling the production of key commercial isotopes such as Mo-99 and Lu-177 is not an appropriate tool to achieve these goals. For example, in the USA, policies exist to prevent the Federal Government through the US Department of Energy from producing commercially available isotopes to avoid competition with the private market.

4. MARKET INFORMATION

(68) On 21 October 2022, the Commission received a letter by a citizen. In this letter, the citizen expresses general concerns about the environmental impacts of the PALLAS reactor and puts forward that medical isotopes can be produced by using the alternative technology being developed by the company SHINE, without the need for a nuclear reactor.

([63]) The opinion issued by the Dutch National Growth Fund in June 2023 can be found here: Adviesrapport derde beoordelingsronde commissie Nationaal Groeifonds | Rapport | Nationaal Groeifonds. The PALLAS project is discussed on pages 30 and 151 to 154. The complainant mentions the following statement on page 30: "*Het advies van de commissie is om aan dit project geen middelen toe te kennen. Het Groeifonds is opgezet om met impulsfinanciering het duurzame verdienvermogen en de innovatiekracht van Nederland te bevorderen. De commissie vindt de PALLAS-reactor zeer belangrijk voor Nederland en de EU vanuit strategisch en maatschappelijk perspectief, maar is niet overtuigd van de bijdrage aan het verdienvermogen en de innovatiekracht van het voorstel. Het Groeifonds is daarom volgens de commissie niet het juiste instrument om dit voorstel te financieren. Daarnaast is de commissie onvoldoende overtuigd dat Europese cofinanciering geen optie is.*" ("The committee's advice is not to allocate resources to this project. The Growth Fund was set up to promote the sustainable earning capacity and innovative power of the Netherlands with impulse financing. The committee considers the PALLAS reactor to be very important for the Netherlands and the EU from a strategic and social perspective, but is not convinced of the proposal's contribution to the earning capacity and innovative power. The Growth Fund is therefore, in the committee's opinion, not the right instrument to finance this proposal. In addition, the committee is insufficiently convinced that European co-financing is not an option.").

(69) On 25 October 2022, the Commission received a letter by another citizen. In this letter, the citizen expresses general concerns about the environmental impacts of the PALLAS reactor and puts forward that medical isotopes can be produced by using alternative technologies, without the need for a nuclear reactor.

(70) On 26 April 2023, the Commission received a letter by a competitor of PALLAS, i.e. the company NorthStar, which produces medical radioisotopes in the United States. In this letter, NorthStar calls on the Commission to consider, when assessing State aid in favour of the PALLAS project, the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical isotopes by implementing the full cost recovery principle.

(71) On 5 December 2023, the Commission received a letter by the U.S. Mission to the European Union in support of SHINE Europe's complaint regarding the Dutch Government's aid in favour of the PALLAS project. In this letter, the U.S. Mission to the European Union puts forward that the aid at issue would be incompatible with the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical isotopes by implementing the full cost recovery principle.

5. POSITION OF THE NETHERLANDS

(72) The Netherlands claims that the notified measures constitute compatible State aid under Article 107(3)(c) TFEU, because they pursue several objectives of common interest in a necessary and proportionate way, and because they do not cause any undue distortion of competition and trade.

5.1. Objectives of common interest

(73) The Dutch Government explains that NewCo will be active in:

- the development, production and provision of medical radioisotopes for diagnostic and therapeutic purposes, and the development of new therapies on the basis of such isotopes;
- the production of industrial radioisotopes;
- conducting nuclear technology research;
- maintaining a high quality of nuclear knowledge infrastructure;
- providing services in relation to dismantling radioactively contaminated installations, and management of (historic) radioactive waste;
- the construction of a new advanced nuclear reactor (PALLAS) and a new Nuclear Health Centre (NHC) dedicated to the production of medical isotopes and medical nuclear technological research.

(74) Based on the above, the Dutch Government has identified six objectives of common interest pursued by the notified aid measures:

1. Providing citizens with a high level of health protection and healthcare by ensuring security of supply of medical radioisotopes;

2. Promoting and facilitating nuclear research, including new nuclear power generation technologies;

3. By realising 1 and 2, contributing to the strategic autonomy of the EU;

4. Contributing to the climate change mitigation objectives;

5. Limiting transport of nuclear materials throughout the EU;

6. Promoting nuclear non-proliferation.

5.1.1. Providing citizens with a high level of health protection and healthcare by ensuring security of supply of medical radioisotopes

(75) Only a limited number of reactors currently produce the majority of the medical isotopes in the world. For instance, the HFR in Petten (the Netherlands) serves approximately 30% of this world market, and approximately 70% of the European market. The current reactors are mainly located in the EU and almost all of them are approaching the end of their operational lifetime. Both the NucAdvisor and the Technopolis studies argue that this ageing infrastructure is unable to meet the increasing demand, and it is therefore expected that from 2030 onwards the European security of supply will be increasingly under pressure ([64]). Moreover, by 2040 Europe's reactors (HFR in the Netherlands, BR-2 in Belgium, MARIA in Poland and LVR-15 in the Czech Republic) will be out of operation ([65]).

(76) Besides the Netherlands, other European countries are investing in new research reactors that could help solve the supply problem. The French Jules Horowitz Reactor (JHR), which is currently under construction and planned to be completed ca. 2030, and the Belgian Multi-purpose hYbrid Research Reactor for High-tech Applications (MYRRHA), which is aimed to replace the BR-2 reactor and planned to be completed ca. 2037, have indicated that they will produce medical isotopes. The relatively young (2004) German Forschungsreaktor München II (FRM-II) will undergo design modifications to be able to produce Mo-99. However, these reactors will focus on research, and will therefore have limited capacity to produce medical isotopes. This is why their combined capacity will not be sufficient to meet European demand for medical isotopes ([66]).

(77) New technologies under development aim at large-scale production of isotopes such as Mo-99, Xenon-133 (Xe-133) and Iodine-131 (I-131) ([67]). Examples of such innovative market players include the US-based SHINE (with an intended European production site in Veendam, the Netherlands) and the Belgian SMART. SMART was intended to mainly produce Mo-99, but the project was ended in March 2023. SHINE is currently being licensed in the US for Mo-99, I-131 and Xe-133 production. In addition, SHINE plans to produce the therapeutic isotope Lu-177 ([68]). However, such innovative projects are often based on laboratory-

([64]) NucAdvisor 2021, p. 12, p. 46, p. 151; Technopolis 2021, p. 1, p. 31.

([65]) In June 2023, the Polish Government announced that the MARIA reactor will be refurbished so as to prolong its operation until 2050.

([66]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

([67]) NucAdvisor 2021, p. 15.

([68]) As SHINE claims to be able in the future to produce Lu-177 without a nuclear reactor, the Dutch Ministry of Health, Welfare and Sports tasked the Reactor Instituut Delft (RID) to check the technological feasibility of this claim. In March 2022, the RID presented its report (177Lu productie

scale successes, which are insufficient to prove whether these new technologies can provide a relevant industrial alternative to research reactors ([69]). In this regard, the Dutch Government points out that, contrary to the complainant's statement (recital (60)), the demise of the SMART project in March 2023 was mainly due to intrinsic technical difficulties resulting in prohibitive costs ([70]). According to the Dutch Government, the demise of the SMART project (despite the support received from the Belgian Authorities) confirms that, while new technologies should be encouraged, they cannot be solely relied upon to ensure security of supply.

(78) The limited production capacity of existing and future reactors, the remaining uncertainty about the technical and commercial feasibility of innovative systems under development and the limited capability of such innovative systems to produce simultaneously different isotopes might lead to a shortage of supply and a dependence on countries outside Europe. Such dependence can be minimised if investments are made in Europe in a mix of technologies that would include, in addition to innovative systems such as SHINE, at least one new reactor ([71]).

(79) As regards the new reactor that is needed in Europe, experts view PALLAS as the most likely candidate ([72]). According to the plan pursued by the Dutch Authorities until 2020, the PALLAS reactor was to be the first privately financed reactor in the world. However, the unsuccessfulness of the Dutch Authorities' attempts to find private financing for the PALLAS project shows that there is a market failure. Such attempts were made first by ECN-NRG in the period 2008-2012, and then by the PALLAS Foundation in the period 2016-2020.

(80) As regards the attempts to find private financing made by the PALLAS Foundation between 2016 and 2020, the Dutch Authorities observe that, already in 2012, when the Dutch Government decided to establish the PALLAS Foundation, the industry represented in the supply chain of medical isotopes was, or could have been, fully aware of the Dutch Government's intention to find private funding for the PALLAS project, because it was widely known that the PALLAS Foundation's mission would include the search for private investors who would build and operate the project. Industry's awareness of this intention was further increased after the PALLAS Foundation was established in late 2013 and started operating in 2014. Additionally, the Dutch Government's intention to find private funding was communicated broadly and publicly ([73]). The Dutch

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met de SHINE technologie | Rapport | Rijksoverheid.nl), which concluded that it should be possible to produce Lu-177 with SHINE's accelerator-driven subcritical reactor.

([69]) NucAdvisor 2021, p. 87; Technopolis 2021, p. 55, p. 58, p. 63.

([70]) ASML's medical-isotope brainchild doesn't make it to the finish line – Bits&Chips (bits-chips.nl) and Escalating complexity thwarts industrialization of non-nuclear radioisotope production – Bits&Chips (bits-chips.nl).

([71]) NucAdvisor 2021, p. 17.

([72]) See the 2020 report by the Dutch National Institute for Public Health and the Environment (RIVM) Supply security for medical radionuclides - additions 2020 (rivm.nl), p. 21, as well as the "European study on medical, industrial and research applications of nuclear and radiation technology" published by the European Commission in 2019 (https://data.europa.eu/doi/10.2833/511137), p. 143.

([73]) See e.g.,: a) 2015-05-15: https://www.nuklearforum.ch/de/news/fortschritte-beim-pallas-projekt, including the statement: "Das restliche Kapital soll während der zweiten Projektphase – sobald die

Authorities point out that this transparency about the PALLAS Foundation's mission was combined with a process that did not include public invitations (e.g. in newspapers) but was targeted only towards potentially relevant investors. However, in identifying such potentially relevant investors, a broad approach was used ensuring that the targeted process covered a wide range of suitable categories of strategic and financial investors. This targeted approach was necessary due to the numerous risks associated with a nuclear project such as PALLAS and to the long and intense due diligence necessary for a private investor to be convinced to invest in such a project. Therefore, the Dutch Authorities consider that the process carried out by the PALLAS Foundation between 2016 and 2020 to find private financing did not exclude any investor that could be reasonably considered to be both suitable for and potentially interested in financing the PALLAS project.

(81) The abovementioned targeted process carried out by the PALLAS Foundation between 2016 and 2020 to find private financing can be described as follows:

- The PALLAS Foundation and its consultant ([74]) developed and maintained a dynamic list of potential investors, identifying potential equity as well as debt providers.
  As regards equity providers, the list included potential investors in various categories like pharmaceutical companies, industrial investors (e.g. construction and installation companies that potentially can support a nuclear project), infrastructure investors that could absorb the risk profile of the PALLAS business case, and the private equity sector, including large pension funds that participate in or collaborate with private equity funds. Special attention was given to investors that already had an exposure to the pharmaceutical sector and were familiar with the risks and opportunities associated to working in the (nuclear) pharmaceutical supply chain. Among those were […].
  Less focus was put on credit providers, assuming that credit providers would step in as soon as the equity providers would be known.

Baubewilligung vorliegt – mit Hilfe privater Investoren beschafft werden."; b) 2015-10-24: https://www.fluxenergie.nl/geen-nieuwe-pallas-reactor/ refers to publications by LAKA and public broadcasters VPRO (ARGOS) on the need to find private investors to obtain continued support from the Region of Noord-Holland; c) 2019-06-05: https://www.telegraaf.nl/financieel/1125726603/pensioengeld-pggm-voor-kernreactor-petten refers to unconfirmed rumours of PGGM stepping in as private investors in PALLAS; d) 2019-07-11: https://www.nucnet.org/news/government-announces-progress-on-pallas-reactor-7-4-2019, including reference to a letter to the Dutch Parliament regarding progress on the interest of private investors; e) 2020-03-13: https://www.nucnet.org/news/preparations-to-continue-after-dutch-council-of-state-approves-zoning-3-5-2020, including the sentence "Its remit also included developing a business case and arranging private financing for the construction and commissioning phase of the new unit."; f) 2020-12-12: https://www.bnr.nl/nieuws/gezondheid/10427930/pallas-reactor-noodzakelijk-voor-leveringszekerheid-medicijnen, an interview with CEO PALLAS by broadcaster BNR (associated with the Dutch Financieel Dagblad) clearly mentioning the search for private investors.

([74]) The PALLAS Foundation used a tender procedure to identify a consultant who would reach out to the international investment community. Three renowned companies participated in this tender, namely […]. The tender was awarded to […] because of its extensive experience in developing public-private partnerships.

- Due to anticipated discussions with various governments and government agencies about international investments in and private ownership of nuclear facilities in the Netherlands, the dynamic list was continuously screened and reduced to potential investors from NATO countries and Australia. The thus short-listed investors were contacted by the PALLAS Foundation and its consultant to probe their potential interest. In total, 41 potentially interested parties were identified, of which over 20 were approached; in the end, conversations were held with more than 15 parties. Several of them stepped into the due diligence process.

  A full due diligence process was completed by […] potential private investors […].

(82) Based on […] received at the end of the process described above (recital (81)), the Dutch Authorities have concluded that private financing for the PALLAS project is not feasible without far-reaching guarantees to be provided by the Dutch Government on matters such as:

a) Revenue uncertainty: Private investors and financiers often require a relatively high level of certainty on off-take, underpinned by long term contracts. However, the current practice in the diagnostic medical isotope (Mo-99) market is contracts that run up to circa four years. The market for therapeutic isotopes is still in development and hence revenue uncertainty remains.

b) CapEx ([75]) uncertainty: In most nuclear reactor projects (power reactors as well as research reactors) substantial CapEx overruns have been reported. This is for instance the case for Hinkley Point C in the UK (circa EUR 5.8 billion overrun) ([76]), Flamanville 3 in France (circa EUR 9.4 billion) ([77]) and the Jules Horowitz reactor in France ([78]). Increases often result from regulatory requirements and first-of-a-kind risks. Although private investors are willing to take some construction risks (as shown by the market consultation about nuclear power plants published by KPMG in July 2021 ([79])), they are not willing to take black swan risks and regulatory risks (i.e. CapEx increases due to design changes required by nuclear regulators). For this, government guarantees are required (see the same KPMG's 2021 market consultation).

c) Risks relating to the required nuclear and conventional licences: Private investors are not willing to bear the licence risk (as evidenced by KPMG's 2021 market consultation). For the PALLAS reactor specifically, this

([75]) "CapEx" (or "CAPEX") stands for capital expenditures.

([76]) UK government, https://www.gov.uk/government/collections/hinkley-point-c, 2016.

([77]) EDF, https://www.edf.fr/en/the-edf-group/dedicated-sections/journalists/all-press-releases/update-on-the-flamanville-epr, 2022.

([78]) NUC Net, https://www.nucnet.org/news/construction-starts-on-france-s-jules-horowitz-research-reactor, 2007 and https://inis.iaea.org/search/searchsinglerecord.aspx?recordsFor=SingleRecord&RN=46098438.

([79]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

concerns the risk that the irrevocable construction licence would not be obtained (or only under certain stringent conditions). Hence, private investors require either a guarantee or an insurance on their investments to that point.

d) NRG legacy risks: Private investors are not willing to take on any risks related to NRG's history. This includes risk resulting from the HFR operations, unplanned unavailability, costs related to decommissioning of the nuclear infrastructure at the Petten site or costs related to the handling of historic nuclear waste. Risks associated with the HFR up to the operating date of the PALLAS reactor can seriously impact the business case. Guarantees and/or risk sharing facilities have been requested by private investors.

e) Decommissioning: The Dutch Government requires a decommissioning facility for the PALLAS reactor to be fully funded upfront, i.e. at the start of the reactor's hot-commissioning. Private investors are not willing to provide this decommissioning fund upfront (as is confirmed by KPMG's 2021 market consultation), but rather prefer a build-up over time. In the interim, a government guarantee or other type of government funding is required.

If the Dutch Government provided such far-reaching guarantees, this would lead to a situation where private parties own the project, while substantial risks remain with the Dutch Authorities. Since this would not result in a fair risk-return balance for the public authorities, in 2020 it was concluded that this would be an unacceptable situation for the Dutch Government ([80]), who has therefore decided to use public funds to build the PALLAS project.

(83) The Dutch Authorities' conclusion that the market is not willing to finance the PALLAS project without far-reaching guarantees to be provided by the Dutch Government was confirmed by discussions with the European Investment Bank (EIB). In 2019, the PALLAS Foundation consulted the EIB about the PALLAS project's eligibility for financing by the Bank. The EIB concluded that, given the project's risks, it was difficult to consider it bankable without proper mitigants in place. The EIB pointed out that "*all comparable cases reviewed featured strong levels of underlying public/state support for the mitigation of key risks*" ([81]). At meetings held in July 2021 and October 2022 between the Dutch Authorities and the EIB, the latter confirmed its earlier assessment that financing by the EIB would only be possible with the backing of the Netherlands in the form of State guarantees.

(84) European studies ([82]) have also concluded that, for large medical isotope production facilities, fully private initiatives are not feasible, due to high investment costs, long payback periods, market uncertainties and lagging implementation of full cost recovery. As a result, public financial support is essential for the realisation of such production facilities.

([80]) Kamerstukken II 2020/21, 33626, nr. 13.

([81]) "Pallas Reactor - Preliminary advisory considerations for the project", European Investment Bank, June 2019.

([82]) See e.g. NucAdvisor 2021, p. 18, p. 146, p. 156.

(85) Research reactors are generally publicly supported worldwide ([83]). Examples include the Belgian BR-2 research reactor owned by the Belgian government ([84]), the LVR-15 reactor funded by the Czech government ([85]) and the MARIA reactor owned by the Polish government ([86]). The HFR too was realised with public funding, provided by the Dutch Government.

(86) New initiatives are also largely publicly funded. For instance, the MYRRHA reactor has received circa EUR 558 million of financial support from the Belgian government ([87]) and the Jules Horowitz reactor is partly owned by the Commissariat à l'Énergie Atomique of the French government ([88]). As NucAdvisor confirms, this is also the case outside Europe: for instance, in the US "*public support is also a key factor of success for centralized installations more dedicated to radionuclides production, like SHINE or NorthStar, as can be seen in Appendix G. Such support is justified by other considerations as well, like self-reliance objectives*" ([89]).

(87) Based on the above, the Dutch Authorities consider that PALLAS, as the new reactor necessary to ensure security of supply of medical isotopes in Europe, can only be realised with public financing.

5.1.2. Promoting and facilitating nuclear research, including new nuclear power generation technologies

(88) Compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production. However, the PALLAS reactor and the NHC will still continue many of the research, development and innovation (R&D&I) activities already carried out in the HFR. Indeed, the second main public function of NewCo will be to strengthen nuclear research in future health and energy applications. In this regard, the Dutch Government indicates that, out of the overall CapEx investments in the PALLAS project, up to [10-25]% is dedicated to specific R&D&I facilities and equipment, such as irradiation facilities with specific characteristics, experimental facilities, in-building laboratories and hot labs, waste treatment facilities and all design, engineering and licensing work associated with these facilities. Over time, NewCo's operational costs related to R&D&I are estimated to vary between [5 and 30%] of the overall operational costs, depending on market developments in R&D&I in the fields of health and energy.

(89) As regards R&D&I in the field of health, NewCo's ambition is to collaborate with University Medical Centres and pharmaceutical companies that are developing new isotopes-based medicines and are looking for a strong supply chain partner who can provide ready-made radiochemicals, or even radiopharmaceuticals, to

([83]) NucAdvisor 2021, p. 85.

([84]) SCK CEN, https://www.sckcen.be/nl/over-sck-cen/bedrijfsinformatie/geschiedenis.

([85]) Centrum výzkumu Řež (cvrez.cz).

([86]) National Centre for Nuclear Research Swierk, https://www.ncbj.gov.pl/en.

([87]) https://myrrha.be/about-myrrha.

([88]) https://jhrreactor.com/en/organisation/#consortium.

([89]) NucAdvisor 2021, p. 86, Appendix G ("US public support to radionuclides supply chain developments") p. 251.

support the critical phases of clinical trials. NewCo is to be such a partner, thanks to the following three activities:

a) Innovation in the FIELD-LAB laboratory, which supports the development of new nuclear drugs for cancer treatment by University Medical Centres (UMCs), start-ups and innovative pharmaceutical companies, and supplies small samples of ready-made radiochemicals for clinical trials ([90]).

b) Processing in the NHC, which will provide an efficient higher volume production of radiochemicals or radiopharmaceuticals, and a series of supporting services.

c) Irradiation in the HFR and in the PALLAS reactor, which will provide high reliability, availability and capacity for a wide range of medical isotopes.

This integrated offer, combining irradiation, processing and innovation, will be made available to research partners (UMCs and pharmaceutical companies) on a non-exclusive basis, and will significantly lower the burden of sourcing and processing radioactive samples, first for R&D&I and later for production.

(90) As regards R&D&I in the field of energy, the Dutch Authorities state that there is a growing interest, from both the public and the private sector, in expanding the nuclear energy component as part of a low carbon energy mix. NewCo will serve this growing demand in particular by contributing to R&D&I in the continued safe operation of existing nuclear power plants, in the development of small modular reactors (SMRs) and in promising Generation IV designs such as thorium-fuelled molten salt reactors and high temperature reactors. NewCo, as the successor of NRG, will continue to invest in its diverse set of specialists and maintain the expertise built up through decades of R&D&I in national and international multi-party public/private collaborations, such as the OECD-NEA's FIDES group and the Euratom R&D programme. These capabilities will enable NewCo to offer a full and balanced portfolio of R&D&I studies and services for future technology generations. Seven relevant areas have been defined in NewCo's R&D&I programme for nuclear energy: Fuel & Material Research; Long Term Operations; Nuclear Modelling & Simulation; Nuclear Safety & Compliance; Radiation Protection; Radioactive Waste Management; Innovative Nuclear Systems.

5.1.3. By realising 1 and 2, contributing to the strategic autonomy of the EU

(91) The Dutch Authorities stress that, in order to decrease the European Union's reliance on non-EU countries, new investments are necessary, as existing installations cannot meet European needs in the long term. As the NucAdvisor study puts it: "*the probability of meeting ^{99}Mo European needs with European means degrades with time, and […] the two reactors remaining after 2040 are unable to entirely cover EU needs*" ([91]). NucAdvisor describes a scenario B.2

([90]) In the last two years, the FIELD-LAB programme has already provided an excellent collaboration opportunity for UMCs and innovative companies.

([91]) NucAdvisor 2021, p. 124.

where the realisation of at least one new research reactor in the EU will minimise the reliance on foreign sources for isotope supply ([92]). The Dutch Authorities assert that it is therefore clear that the PALLAS reactor is necessary for the European strategic autonomy in the field of medical isotopes.

(92) As regards the complainant's argument that the PALLAS reactor will probably produce Lu-177 by using Yb-176 sourced in Russia and that, therefore, the production of Lu-177 by the PALLAS reactor risks prolonging a strategic dependency on Russia (recital (65)), the Dutch Authorities acknowledge that currently most of the Yb-176 available on the market originates in Russia, with some market players (such as Kinetrics in Canada, ORANO in France, Eckert & Ziegler in Germany, and SHINE in the USA) aiming at developing alternative sources of Yb-176. However, the European strategic autonomy to which the PALLAS reactor will contribute relates to the medical isotopes administered to patients, not to the inputs used in their production. In addition, the PALLAS reactor and the NHC will also carry out research into recycling technology for the re-use of Yb-176 targets.

5.1.4. Contributing to the climate change mitigation objectives

(93) In 2022, the European Commission approved a Complementary Delegated Act ([93]) adding, under strict conditions, specific nuclear and gas energy activities in the list of 'transitional' economic activities covered by the EU Taxonomy. The Taxonomy Regulation ([94]) provides investors with guidance on economic activities that can be considered environmentally sustainable.

(94) Through its R&D&I programmes, NewCo will support and contribute to the development of these transitional activities, such as the pre-commercial stages of advanced technologies to produce energy from nuclear processes with minimal waste from the fuel cycle (section 4.26 added by the Complementary Delegated Act) and electricity generation from nuclear energy in existing installations (section 4.28 added by the Complementary Delegated Act). In this context, NewCo will contribute to extending the lifetime of existing nuclear power plants and the PALLAS reactor will provide facilities to support R&D&I on the development of innovative and sustainable next generation nuclear power plants such as small modular reactors (SMRs).

5.1.5. Limiting transport of nuclear materials throughout the EU

(95) A major constraint in the supply chain of medical isotopes is the radioactive decay of the isotopes. Logistical efficiency and just-in-time delivery are essential for the economic sustainability of the global supply chain. The Energy & Health Campus in Petten, the location of the current HFR and of the future PALLAS

([92]) NucAdvisor 2021, p. 136.

([93]) Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities, OJ L 188, 15.7.2022, p. 1-45.

([94]) Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020, p. 13-43.

reactor, is a unique site in Europe where both irradiation facilities (HFR/PALLAS reactor) and processing facilities for diagnostic medical isotopes (the Molybdenum Processing Facility ([95])) are situated. With the Nuclear Health Centre (NHC), in the same site there will also be processing facilities for therapeutic isotopes ([96]). Such a "combined approach", whereby irradiation and processing facilities are located in the same site, makes sure that transport of radioactive material across Europe can be minimised and optimised, which has a public value in terms of safety and security for EU citizens.

(96) The Dutch Authorities point out that the above "combined approach" is common practice, as governments around the world finance the construction and/or the operation in one site of both irradiation and processing facilities. For example, the Belgian government financially supports the development of the Centralized Radiochemical Facility. According to the Dutch Authorities, the fact that almost all these "combined approach" projects are fully publicly owned and/or subsidised by governments, is an indicator of market failure.

(97) As mentioned above (see recital (62)), the complainant alleges that there is no market failure justifying State aid for a processing facility like the NHC, because such a facility (as opposed to a reactor) can be built by private investors without major technical and financial difficulties. In this regard, the Dutch Authorities point out that, while "dedicated" processing facilities – i.e. processing facilities developed by pharmaceutical companies exclusively for their specific medical isotopes which have already passed all relevant testing and registration requirements – may indeed be attractive for private investors, the NHC will not be such a dedicated facility. In fact, the NHC will be a generic (non-specific) facility (matching the generic PALLAS reactor), whose specifications allow the processing of a variety of isotopes that are known or expected to have medical applications.

(98) Finally, the Dutch Authorities point out that the inclusion of the NHC in the PALLAS project makes sense from a financial viewpoint, because the revenues of the NHC will shorten by two years the payback period of the public loans granted to NewCo. In fact, if the NHC (both the income generated by it and the planned CapEx and related financing) were excluded from the project, a full repayment of the loans is expected in 2051, instead of 2049.

(99) Therefore, the Dutch Authorities consider that, contrary to the complainant's opinion (recital (62)), there is a need to support the PALLAS project as a whole comprising both the PALLAS reactor and the NHC.

([95]) The Molybdenum Processing Facility (MPF) is owned by the NRG and operated by Curium, the world's largest nuclear medicine company. Curium, as a separate legal entity with its own governance structure related to its private equity ownership, is completely independent from the HFR. In the MPF at Petten, Curium processes not only Uranium targets irradiated in the HFR, but also Uranium targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland.

([96]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

5.1.6. Promoting nuclear non-proliferation

(100) This objective relates to the Non-Proliferation Treaty and the Additional Protocol ([97]) in which all EU Member States have committed to nuclear non-proliferation. In the past, the production of medical radioisotopes required the use of Highly Enriched Uranium (HEU), that can be used in nuclear weapons. For security reasons, the EU has committed to convert radioisotopes processing facilities to use Low Enriched Uranium (LEU), which cannot be used in nuclear weapons. At the 2012 Nuclear Security Summit in Seoul, the Netherlands, Belgium, France and the United States issued a joint statement in which they reaffirmed their commitment "*to minimize the use of Highly Enriched Uranium (HEU) for civilian purposes, where technically and economically feasible, in order to advance the goal of nuclear security, as stated in the Washington Final Communiqué and Work Plan […]. In the longer term [after 2015], the use of HEU will be completely eliminated for medical isotopes that are produced in Belgium, France and the Netherlands and used in those countries and in the United States*". In the meantime, this objective has been completely reached in the Netherlands: the HFR has been using LEU fuel since 2006; both the HFR and the Molybdenum Processing Facility completed the conversion to LEU targets in 2021. The final step is to have the PALLAS reactor designed and operational on LEU fuel and targets, thereby delivering a substantial contribution to European and global non-proliferation objectives.

(101) Based on the considerations in sections 5.1.1. to 5.1.6. above (recitals (75) to (100)), the Dutch Authorities hold that the notified aid measures pursue well defined objectives of common interest. As regards the opinion of June 2023 whereby the Dutch National Growth Fund advised the Dutch Government not to use that Fund's budget to finance the PALLAS project, the Dutch Authorities stress firstly that the Fund explicitly acknowledges the strategic and social importance of the PALLAS project for the Netherlands and the EU, and secondly that the Fund's statement that the PALLAS project lacks "earning capacity" is a reference to the objectives pursued by the Fund, which cannot in any case be understood as a criticism of the business case on which the Dutch Government has based the PALLAS project ([98]). Therefore, contrary to what is suggested by the complainant (recital (63)), this opinion by the Dutch National Growth Fund cannot be considered as evidence that the PALLAS project does not contribute to an objective of common interest.

([97]) See Treaty on the Non-Proliferation of Nuclear Weapons (NPT) | IAEA.

([98]) The opinion issued by the Dutch National Growth Fund in June 2023 can be found here: Adviesrapport derde beoordelingsronde commissie Nationaal Groeifonds | Rapport | Nationaal Groeifonds. The PALLAS project is discussed on pages 30 and 151 to 154. In particular, on page 152 the Funds states the following: "*De commissie adviseert het kabinet om geen middelen toe te kennen aan dit project vanuit het Nationaal Groeifonds. De commissie vindt de PALLAS-reactor zeer belangrijk voor Nederland en de EU vanuit strategisch en maatschappelijk perspectief, maar is niet overtuigd van de bijdrage aan het duurzame verdienvermogen van Nederland.*" ("The committee advises the government not to allocate resources to this project from the National Growth Fund. The committee considers the PALLAS reactor very important for the Netherlands and the EU from a strategic and social perspective, but is not convinced of its contribution to the sustainable earning capacity of the Netherlands.").

5.2. Proportionality

(102) The Dutch Government points out that it has taken measures to ensure that the aid amount is limited to the minimum needed to achieve the identified objectives.

(103) In particular, the Dutch Authorities have provided a detailed business plan, showing that the PALLAS project is expected to be fully operational by 2033.

(104) The project entails total investment costs (CapEx) for EUR [2-3] billion over the expected lifespan of the project running until 2070. CapEx mainly relate to the PALLAS reactor, as the largest (future) asset of NewCo, but also include investments for the NHC and incremental capitalised investments in ancillary assets on the Petten site that are used (or remain to be used) in the operations of NewCo after the Commercial Operating Date (COD) of the PALLAS reactor.

(105) The length of the business plan period is 52 years, from 2019 until 2070. This includes 5 years and a half of preparation phase (until the date of incorporation of NewCo set in the Financial Model on 1 July 2024 ([99])), 6 and a half years of construction phase, 2 years of transition in which the production will be shifted to the PALLAS reactor, and 38 years, from 2033 onwards, in which NewCo will be generating revenues from the PALLAS reactor and NHC.

(106) The Dutch Authorities explained that the counterfactual scenario consists in the absence of any alternative project by NewCo. Therefore, the funding gap has been determined exclusively on the basis of the factual scenario.

(107) The Dutch Government points out that it has taken measures to ensure that the aid amount is limited to the minimum needed to achieve the identified objectives.

(108) A combination of financial sources will be used to finance the project:

(a) The loans (amounting to maximum EUR 469.7 million) provided since 2019 and to be provided until the incorporation of NewCo at which point the Dutch Government is envisaged to become the sole shareholder of the company. This funding is provided under the same terms and for the same purpose as the loans authorised by the 2013 Decision i.e., to implement Phase 1 of the PALLAS project.

(b) The debt financing (amounting to EUR [400-800] million) and equity financing (amounting to EUR [800-1 100] million) to be provided after the incorporation of NewCo, which financing is covered by both an Equity Contribution Agreement and a Credit Agreement to be entered into between the Dutch Government and NewCo. The equity part is currently assumed in the Financial Model to account for [40-80]% of the total planned public funding after the incorporation of NewCo and the long-term debt for the remaining [20-60]%, both in line with the Draft Equity Contribution Agreement and the Draft Credit Agreement. The allocation to

([99]) While the 26 June 2024 notification indicated that the planned date for the aid to be granted was 1 July 2024, on 28 June 2024 the Dutch Authorities clarified that no aid will be granted prior to the date of adoption of the Commission decision.

equity and long-term debt as set out above has been carefully considered, taking into account the debt (service) capacity of NewCo in the long run. When allocating [20-60]% to long-term debt, it is expected that NewCo will be able to comply with its debt service obligations as well as reach market standard financing ratio's (e.g. leverage-ratio and debt service coverage ratio (DSCR)) within a reasonable number of years following the COD of the PALLAS reactor.

(109) NewCo plans to repay the public funding by using the proceeds of its medical isotope production activities. NewCo plans to reimburse the debt and remunerate the equity financing through interests, progressive loan reimbursements and dividends over the lifetime of the project.

(110) Finally, the Dutch Government points out that the notified measures may not be cumulated with other aid to cover the same eligible costs.

(111) The business plan provided by the Dutch Authorities sets out the forecast revenues and costs of the project.

Revenues

(112) According to the Dutch Authorities, the revenues from the project will stem from the activities of NewCo which can be grouped into three main categories:

(a) Medical radioisotopes: this includes Mo-99 (unprocessed), therapeutic isotopes and revenues generated by the processing activities (e.g. with the NHC);

(b) Industrial isotopes ([100]); and

(c) Research and other services, which include the consultancy & services business (C&S) and MPF services. C&S concerns monitoring and quality testing services, safety analyses, licensing support, consultancy on waste and decommissioning, and various services to continue safe operations; the MPF is the Molybdenum Production Facility which is used and operated by Curium for extracting Mo-99 from irradiated targets.

(113) Based on the revenue projections provided by the Dutch Authorities in the base case model of NewCo, the following percentages result (on average) for 2033 – 2035:

- [50-80]% of total revenues from medical radioisotopes: this includes Mo-99 (unprocessed), therapeutic isotopes and revenues generated by the NHC. Therapeutic isotopes are the most important revenue driver, generating circa [30-60]% of revenues on average in the period 2033-2070;

- [1-5]% of total revenues from industrial isotopes; and

([100]) Industrial isotopes are used by manufacturers as tracers to monitor fluid flow and filtration, detect leaks, and gauge engine corrosion of process equipment.

- [15-30]% of total revenues from research and other services (including C&S and MPF services), where the research activities represent [1-5]% of the total revenues (on average) for 2033 – 2070.

(114) The Dutch Authorities have indicated that revenues are expected to grow over the lifetime of the project, among other things driven by assumed price indexations in line with inflation. Table 1 provides an overview of the base case revenue projections for 2033–2050 in EUR million.

Table 1: Evolution of base case revenue projections in EUR million

[…]

Source: Information provided by the Dutch Authorities in the Notification

Costs

(115) As described in recital (104), the CapEx of the PALLAS project amount to EUR [2-3] billion over the expected lifespan of the project running until 2070.

(116) The Dutch Authorities have indicated that, on top of the CapEx, the business plan also reports the other operating costs of the Project, which encompass the operating expenses relating to the operations of the PALLAS reactor and the NHC (including personnel, fuel costs, maintenance, overhead etc.).

(117) According to the Dutch Authorities, personnel costs are a key driver of costs. Other operating expenses include waste, utility and transport costs, maintenance expenses and overhead costs, among others. For the NHC the other operating expenses also include the internal cost price of irradiated targets supplied by the PALLAS reactor for processing in the NHC. All operating expenses are subject to indexations in line with inflation.

(118) The Dutch Authorities have indicated that depreciation expenses mainly relate to the PALLAS reactor, as the largest (future) asset of NewCo, but also include depreciation of the NHC and of incremental capitalised investments in ancillary assets on the Petten site that are used (or remain to be used) in the operations of NewCo after the COD of the PALLAS reactor.

(119) Finally, the Dutch Authorities have indicated that provisions include provisions for the future decommissioning of the PALLAS reactor (foreseen after 2070) and the (indexation effect on) provisions for the future decommissioning of other nuclear contaminated buildings (foreseen in 2040-2045).

Funding gap of the project

(120) The Dutch Authorities have provided the business plan and calculations for the funding of the PALLAS project, i.e., the net present value ('NPV') of the project's cash flows, net of State support. The funding gap analysis is based on a business plan which encompasses Phase 1 – Design, tendering, permitting, financing; Phase 2 – Construction; and Phase 3 – Operation – of the PALLAS project. The Dutch Authorities have indicated that the business plan only contains the incremental cash flows related to the PALLAS project and does not contain

any cash flows relating to the HFR in the transition period to the PALLAS reactor nor any cash flows related to the decommissioning of the HFR.

(121) The funding gap has been estimated by the Dutch Authorities using the Weighted Average Cost of Capital ('WACC') as discount factor. Based on the latest available information as of June 2024, the WACC is estimated by the Dutch Authorities at [10-20]%.

(122) As concerns the cost of equity, the risk-free rate of 2.5% has been estimated by the Dutch Authorities as the yield of 30-year German government bonds as of 15 June 2024, derived from Capital IQ. The market risk premium (MRP) of 5% has been derived from the 2024 MRP study of KPMG The Netherlands ([101]). The unlevered beta of [0.5-2.5] has been calculated based on a peer group of listed companies in the construction business using data from Capital IQ.

(123) Table 2 summarises the components of the cost of equity. The Dutch Authorities explain that the resulting [5-15]% cost of equity does not yet include the additional risk premia estimated at [1-10]%.

Table 2: Breakdown of cost of equity's components

PALLAS CoE - WACCs	
As at 15 June 2024	
Unlevered beta	[0.5-2.5]
Equity w eight	[40-80] %
Debt w eight	[20-60] %
D/E	[30-70] %
Levered beta	[0-2]
Market risk premium	5.0%
Risk-free rate	2.5%
Corporate risk premium	[5-10]%
Cost of equity	**[5-15] %**

Source: Information provided by the Dutch Authorities in the Notification

(124) Additional risk premia have been estimated by the Dutch Authorities at [1-10]%, based upon a size premium of [1-5]%, as estimated by Kroll (2023), and an additional risk premium of [1-5]% for specific risks related to nuclear construction projects. The size premium is justified based on specific characteristics of the project, such as its reliance on a single asset (i.e. the PALLAS reactor), its concentration of revenue sources in only two markets (diagnostic isotopes and therapeutic isotopes) and its operation with a limited number of key clients, particularly in the Mo-99 business. The additional risk premium is justified with reference to the significant uncertainties in the project, for example uncertainties related to offtake in the therapeutic isotopes market.

(125) Based on the above, the total cost of equity has been calculated by the Dutch Authorities at [10-25]%.

([101]) Equity Market Risk Premium – Research Summary.

(126) As concerns the cost of debt, the post-tax cost of debt has been calculated at [1-10]% based on the 1-month EURIBOR estimated at 3.579% by Bloomberg as per 15 June 2024, an interest margin of [400-800] bps, which corresponds to a […] rating with […] level of security or a […]rating with […] level of security, and the Dutch corporate income tax rate of 25.80%.

(127) According to the Dutch Authorities, the resulting NPV of the project amounts to EUR [-1 - -2] billion, meaning that absent state aid support, the project would not be viable as its NPV, based on the WACC, is negative.

(128) To calculate the aid amount and ensure this is limited to the minimum needed to achieve the common objectives pursued, the Dutch Authorities explain that the gross grant equivalent on both government debt and government equity is calculated as the NPV of the delta in equity returns resulting from the business case (i.e. the IRR) and the delta in interest charges when applying the actual returns included in the business case for the PALLAS project versus a scenario where the assumed market parameters are applied.

(a) Gross grant equivalent (or aid element) on equity: The gross grant equivalent on equity amounts to EUR [500-800] million. This is calculated by the Dutch Authorities as the NPV of all equity cash flows (i.e. disbursements by the Dutch Authorities to NewCo and dividends paid to the Dutch Authorities by NewCo), using as a discount rate the Cost of Equity (of [10-25]%). The resulting value indicates the 'shortfall' in equity returns to reach the required return (i.e. Cost of Equity), i.e. the delta in the IRR of equity cash flows that the Dutch Government is willing to accept versus what is assumed an average market participant (private investor) would require.

(b) Gross Grant Equivalent on Senior Debt: The Gross Grant Equivalent or aid element on Senior Debt equals EUR [100-400] million. As set out above, this is calculated by the Dutch Authorities based on the difference in the interest costs between Q3 2024 and the full redemption of the government loans (end of 2049) by applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs that result based on the interest rates from the Draft Credit Agreement. The interest costs in both scenarios are based on the loan balance resulting from the incremental business case including the expected disbursements, interest accruals, mandatory repayments and accelerated repayments based on a cash sweep. The resulting difference in interest costs is discounted using the WACC of [5-20]%. According to the Dutch Authorities, the underlying assumption for using the WACC as the discount rate is that the lower interest rate in the Senior debt instrument provided by the State will lead to an advantage for NewCo which the company should then invest with the aim to yield a return in line with the overall required return for the business (i.e. the WACC).

(c) Gross Grant Equivalent on Old Debt: The Gross Grant Equivalent or aid element on Old Debt equals EUR [200-500] million. The approach to the Gross Grant Equivalent on Old Debt is similar to the approach for Senior Debt, with two key differences: the Gross Grant Equivalent on Old Debt is assessed from Q3 2019 onwards (i.e. first quarter where a loan that is part

of this notification is disbursed); and the (difference in) interest costs prior to 1 July 2024 are carried forward (i.e. interest is compounded using the WACC) to 1 July 2024, while the difference in interest after 1 July 2024 is discounted using the WACC, in line with approach for the Senior Debt.

(129) According to the Dutch Authorities, the resulting Gross Grant Equivalent amounts to EUR[800 1 700 million], as shown in Table 3 under column "Base case WACC". This implies that the funding gap is EUR [50-400] million higher than the total Gross Grant Equivalent. From the perspective of the Dutch Authorities, this means that the aid to the PALLAS project is proportionate.

(130) Table 3 also includes a sensitivity analysis provided by the Dutch Authorities in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium (ARP) of [1-5]% (under column "WACC excl. ARP"). According to the Dutch Authorities, it results from the WACC sensitivity that the aid can still be found proportionate.

Table 3: Summary of the proportionality analysis, with sensitivity on the WACC

NPV gap analysis

WACC assumptions	**WACC excl. ARP**	**Base case WACC**
Cost of Equity	[10-25]%	[10-25]%
E/(D+E)	[40-80]%	[40-80]%
Cost of Debt (after tax)	[1-10]%	[1-10]%
D/(D+E)	[20-60]%	[20-60]%
WACC	[5-20]%	[5-20]%
EURk		
Aid element - Equity	[500 000-800 000]	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**	**[800 000-1 700 000]**
funding gap	([1 000 000-2 000 000])	([1 000 000-2 000 000])
NPV gap	**([50 000-400 000])**	**([50 000-400 000])**

Source: Information provided by the Dutch Authorities in the Notification

5.3. No undue distortion of competition and trade

(131) The Dutch Authorities consider that the notified aid measures will not unduly distort competition and trade in the European Union, for the following reasons:

1) The market of medical isotopes is already atypical and distorted, as the existing reactors have been realised with public funding. New initiatives too are generally developed with public support, as shown by many ongoing projects for research reactors (see recital (86)) or for nuclear

power plants ([102]). This is due to the fact that nuclear (research) reactors typically combine long term investment risks with only limited revenue certainty ([103]). The market consultation about nuclear power plants published by KPMG in July 2021 ([104]) concludes that government involvement is inevitable for such large-scale projects. That market consultation also confirms that private investors are not willing to take first-of-a-kind risks such as the ones relating to the PALLAS reactor.

2) At present, the HFR operated by NRG serves approximately 30% of the world market for the main diagnostic isotope Mo-99, and approximately 70% of the European market. The Dutch Authorities consider that NewCo's market share will not be larger than the current market share of NRG, given the forecasted increase in global demand. A 2022 report made for the Dutch Government by KPMG concludes that, given the forecasted increase in global demand and the anticipated Mo-99 production capacity of the PALLAS reactor, NewCo's market share will not be larger than the current market share of NRG. As regards therapeutic isotopes (such as Lu-177), the abovementioned 2022 report reaches a similar conclusion: once the PALLAS reactor starts operations, NewCo's share in the world market for therapeutic isotopes will not be bigger than the share of NRG in the same world market (estimated at 13% for 2023). In this regard, the Dutch Authorities explain that, although the PALLAS reactor's theoretical maximum production capacity ([200 000 – 500 000] 6-day Ci per year) will be higher than that of the HFR (241 800 6-day Ci per year), the business case scenarios show an actual market share of NewCo (with the PALLAS reactor) that will not significantly grow compared to NRG's (with the HFR) and will probably be slightly smaller. This is due to the fact that the market for medical isotopes is characterised by growing demand, especially for therapeutic isotopes, in Europe and globally ([105]). Also in the transitional period, expected to last two years, during which

([102]) Examples of new nuclear power plant projects supported by governments include: Hinkley Point C, for which the UK government has entered into a contract covering the difference between a set strike price and actual prices (https://www.gov.uk/government/collections/hinkley-point-c, 2016); Paks II, for which the Hungarian government has provided a 100% guarantee (https://ec.europa.eu/commission/presscorner/detail/en/IP_17_464); Voglte in the US, funded by government-related energy companies and supported with a loan guarantee of the US Department of Energy (https://www.reuters.com/article/us-usa-nuclearpower-vogtle-idUSKCN1R31X9, 2019); Elektrárna Dukovany II in the Czech Republic, where a two-way contract for difference (with price support for 40 years) is applied (https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2366).

([103]) This is also confirmed in the Commission's State aid decision on Hinkley Point C, where a long construction and operating time, and hence a long payback period (of more than 30 years), is mentioned (Commission Decision of 08.10.2014 on the aid measure SA.34947 (2013/C) (ex 2013/N) which the United Kingdom is planning to implement for support to the Hinkley Point C Nuclear Power Station, recital 89).

([104]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([105]) According to the Netherlands, experts expect a market growth for the main diagnostic isotope Mo99 of 3-5% per year in the period 2020-2030, and a market growth for therapeutic isotopes of 33% (2019-2025) and 25% (2025-2030). Therefore, despite the maximum capacity of the PALLAS reactor being larger than the current capacity of the HFR, the overall market demand will also increase and hence a larger capacity does not automatically lead to an increase in market share.

the HFR and the PALLAS reactor will be both in operation, NewCo's market share will not be larger than the current market share of NRG: in fact, during this period a stepwise ramp-up of the production of the PALLAS reactor will be accompanied by a parallel stepwise scale-down of the production of the HFR, so that overall there will be no major increase in revenues.

3) The Dutch Government aims to operate as a market investor in the sense that NewCo shall repay the public funding and shall implement the full cost recovery (FCR) principle. Historic and current prices of medical radioisotopes are insufficient to provide for an economically sustainable business environment. Implementation of the FCR principle is one of the key objectives of the OECD-NEA, according to which recovering the full cost of production in the pricing for irradiation services is crucial to ensuring economic sustainability and a long-term security of supply ([106]). The implementation by NewCo of the FCR principle will lead to more mature market conditions worldwide. Furthermore, NewCo will charge a reasonable margin for the medical isotopes it will produce on a commercial basis.

4) The Dutch Government points out that NewCo will allocate costs in such a way as to avoid any cross-subsidisation between the funding received for R&D&I activities and the production of medical isotopes. In the case of effective collaborations within the meaning of paragraph 16(h) of the EU Framework for State aid for research and development and innovation (the "R&D&I Framework") ([107]), NewCo will comply with section 2.2.2. ("Collaboration with undertakings") of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration. These measures will further diminish potential distortions of competition and trade between the Member States.

5) The Dutch Government points out that, given the complexity of the production process of medical isotopes and their limited shelf life, for any purchaser of medical isotopes it is absolutely necessary to have multiple suppliers, because of down-time of production facilities (this is the case for both reactors and the newly proposed technologies) and because no one supplier can completely meet (European and global) demand. The presence of multiple producers in the market will also lead to pharmaceutical companies being more incentivised to invest in new therapies using medical isotopes. Therefore, the Dutch Government also welcomes initiatives such as SHINE to ensure global supply of medical isotopes and has provided SHINE with assistance through among other

([106]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012, p. 7.

([107]) Communication from the Commission "Framework for State aid for research and development and innovation" 2022/C 414/01 (C/2022/7388), OJ C 414, 28.10.2022, p. 1-38.

things subsidies and loans ([108]). In this regard, the Dutch Authorities also point out that SHINE's statement, according to which the Dutch Government's support in favour of PALLAS is having a chilling effect on SHINE's investors at a critical time for the construction and scaling of SHINE's production facilities in the USA and in Veendam (the Netherlands), is contradicted by the fact that SHINE's decision to construct and scale its production in Veendam was taken in May 2021 ([109]), i.e. after the Dutch Government had already publicly announced its intent to support the PALLAS project in a letter to the Dutch Parliament in December 2020 ([110]). Furthermore, the Dutch Authorities point out that, according to publicly available information, by late 2023 SHINE had raised from investors a total of $ 742.2 million ([111]), including a $ 70 million round in October 2023 in which both existing investors and new institutional investors participated ([112]). In November 2023, SHINE also announced a long-term supply agreement with Nucleus RadioPharma, the world's first fully integrated development, manufacturing and supply organisation for radiopharmaceuticals ([113]). This, according to the Dutch Authorities, indicates that SHINE is one of the industry's most promising and rapidly expanding businesses, which continues to attract private investments.

(132) As concerns the implementation by NewCo of the FCR principle, mentioned under point 3) of recital (131), the Dutch Government stresses the following:

a) The Netherlands is one of the signatories of the 2014 Joint Declaration supporting the implementation of the FCR principle and of the other OECD recommendations ([114]). The international implementation of the FCR principle is also designated as a core task for NRG|PALLAS in the 2018 decision allocating responsibility for the PALLAS project to the Ministry of Health, Welfare and Sport ([115]). Consequently, NRG|PALLAS has proposed to the Dutch Government a business case for the PALLAS project which

([108]) The Dutch Authorities have provided various loans and subsidies to SHINE and are in the process of providing further assistance: 1) the Ministry of Health, Welfare and Sports provided a EUR 10 million loan, paid in two tranches in 2021 and 2022; 2) the Investment and Development Company for the North of the Netherlands provided a subordinated loan of EUR 1 million; 3) the Province of Groningen provided a subordinated loan of EUR 4 million and a subsidy of EUR 5 million. In addition, the Ministry of Health, Welfare and Sports is considering to grant to SHINE EUR 8 million under the IPCEI Health "Med4Cure" approved by the European Commission on 28 May 2024 (https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2852).

([109]) SHINE Technologies | SHINE selects Netherlands for European isotope production facility (shinefusion.com).

([110]) Kamerbrief over stand van zaken Pallas-reactor | Kamerstuk | Rijksoverheid.nl.

([111]) https://www.crunchbase.com/organization/shine-medical-technologies/company_financials.

([112]) SHINE Technologies | SHINE Technologies Raises $70 Million Financing Round to Accelerate the Commercialization of Near-Term Applications of Fusion Technology (shinefusion.com).

([113]) https://www.businesswire.com/news/home/20231116001648/en/SHINE-Technologies-and-Nucleus-RadioPharma-Partner-to-Advance-Radioligand-Cancer-Treatments.

([114]) NEA press release - Joint Declaration on the Security of Supply of Medical Radioisotopes (oecd-nea.org).

([115]) stcrt-2019-1202.pdf (officielebekendmakingen.nl).

internalises the FCR principle: indeed, this business case foresees full coverage of the costs to be incurred, as well as full payback of the public financing (to be) provided for the PALLAS project.

b) Despite the efforts made by the OECD-NEA High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR), there is still no international consensus on the various cost components to be covered by FCR ([116]). Nevertheless, the business case for the PALLAS project foresees a far-reaching FCR model whereby the prices charged by NewCo for the PALLAS products and services will reflect in particular the following costs: preparation phase ahead of the construction of the reactor, licensing, regulatory changes, insurances and taxes, location and ground costs, all regular operational expenses (personnel, fuel, maintenance, overhead, utilities, etc.), refurbishments, financing, depreciation, security, radioactive waste management (both short-term and long-term storage of radioactive waste), decommissioning of the reactor and of nuclear-contaminated buildings ([117]). This is a far-reaching FCR model in that it covers costs that are often not reflected in the prices charged by other reactors for their medical isotopes ([118]), meaning that the prices for the PALLAS isotopes will likely be higher than average market prices. In any case, a comparison of the above-listed costs (covered by the PALLAS FCR model) with the cost items mentioned by the complainant as necessary elements of a genuine FCR pricing (recital (61)) shows that the latter are covered by the PALLAS FCR model.

c) Another FCR-related issue on which there is still no international consensus is how to allocate costs to individual products and services ([119]). Indeed, it is difficult to develop a consistent, verifiable and auditable model for such a cost allocation: the majority of the cost components are not driven by the specific products and services, and do not scale with the volume of these products and

([116]) The countries involved in the OECD-NEA HLG-MR discussions have produced self-assessments about FCR. From these self-assessments it is clear that the countries still have different opinions regarding the cost components to be covered by FCR. These self-assessments are included in the following reports: 2014 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Results from the Second Self-assessment of the Global 99Mo/99mTc Supply Chain (oecd-nea.org); 2017 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Results from the Third Self-assessment of the Global Mo-99/Tc-99m Supply Chain (oecd-nea.org); 2019 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Final Report of the Fourth Mandate of the High-level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) (oecd-nea.org).

([117]) In particular, as explained in the Netherlands' submission of 28 August 2023, "*Depreciation on CAPEX related to the construction of the PALLAS-reactor and NHC (as far as construction costs are capitalised) as well as CAPEX investments related to periodic maintenance and required refurbishments during the life time of the PALLAS-reactor and NHC are part of the business case as well*".

([118]) An example of this is decommissioning. Depending on the country where the reactor is located, the responsibility for decommissioning costs is subject to different national regimes, ranging from full responsibility of the government to full responsibility of the reactor operator. As mentioned above, according to the FCR model adopted for the PALLAS project, decommissioning costs will be borne by NewCo and reflected in the prices of the products and services provided by PALLAS. Another such example is the costs for the radioactive waste management.

([119]) The absence of an international consensus on how to allocate costs to individual products and services, is shown by the OECD-NEA HLG-MR reports mentioned in footnote 116.

services, but they are common costs of the infrastructure relating to e.g. fuel, cooling, staff, financing, decommissioning, etc. Many countries participating in the OECD-NEA HLG-MR have therefore confirmed that such common costs of the infrastructure – if at all reflected in the prices – are typically allocated on the base of the turnover related to the products and services, and not on the base of the amount or volume of the products and services: for example, if 60% of the turnover comes from public subsidies and 40% from unsubsidised activities, reactor operators tend to allocate 60% of all the costs to publicly subsidised products/services and 40% to unsubsidised products/services. This means that, in the common market practice, FCR is implemented at the company level, not at the level of individual products and services ([120]). In addition, allocating costs to specific irradiation positions is made problematic by the variety of the possible utilisation scenarios over time, the difficulty in counting neutrons and the interference between various positions within the core of the reactor. This is why the FCR model applied by the Dutch Government to the PALLAS project follows the common market practice described above, thereby making it the responsibility of NewCo's board of directors to guarantee cost coverage over the whole portfolio of products and services that the company will provide.

d) Since the Dutch Government does not plan to finance the operation of NewCo after the PALLAS reactor has started commercial production, the implementation by NewCo of the FCR principle means that the company will need to recover the relatively high costs associated with its operations, including the ones relating to the PALLAS reactor, as detailed under point b) above. Even so, the expected internal rate of return matches the Dutch Government's requirements. As a result, from a business perspective there will be no incentives for NewCo to price its products and services below FCR or LCUM.

e) The Dutch Government, as a shareholder of NewCo, will act in a similar fashion as with its other State holdings. In all these similar situations, the Dutch Government requires the companies in which it is the sole or majority shareholder to achieve a reasonable sector-specific rate of return ([121]). This approach will also ensure that any agreements reached by NewCo with suppliers and clients will occur at arm's length, rather than with public policy objectives in mind. Another reason why policy objectives cannot determine price is that, under the Law on Market and Government, the Dutch Government, when operating a State-owned business, is required to charge at least the integral cost for any goods or services it provides ([122]). This law is

([120]) The Dutch Authorities point out that, to their knowledge, there is no publicly available report or study confirming that the common market practice in the medical isotopes sector consists in applying FCR at the company level, and not at the level of individual products and services. Nevertheless, the Dutch Authorities conclude that applying FCR at the company level is the common market practice, because most irradiators require governmental support to remain financially viable at "company" level and because the reactors currently applying FCR do so on the basis of a limited FCR model. The Dutch Authorities state that this is the only information available on the application of FCR, and that no examples exist for the application of FCR at product level.

([121]) See for further information the Dutch Ministry of Finance's 2022 report on State-owned enterprises, for example section 5.7 (Bijlage 1 - Nieuwe nota Deelnemingenbeleid 2022 (overheid.nl)).

([122]) Law on Market and Government (https://zoek.officielebekendmakingen.nl/stb-2011-162.html).

independently enforced by the Netherlands Authority for Consumers and Markets (ACM), which is empowered to investigate any violation thereof either on its own initiative or following a complaint. Should it find that the integral cost price is not applied to a good or service, the ACM has the power to impose fines until the State-owned enterprise complies. As a result, NewCo will not price below FCR levels due to public policy objectives.

f) To monitor the compliance by NewCo with the FCR principle as of the commercial operating date of the PALLAS reactor, the Dutch Government will appoint a Monitoring Trustee. The Trustee, who will be independent and will not receive instructions from the Dutch Government, will act in compliance with the Trustee Mandate submitted by the Dutch Authorities (Attachment 1 to the present Decision).

(133) Regarding the Trustee Mandate (mentioned in point f) of recital (132)), its provisions and the Commitments taken therein by the Dutch Authorities can be broadly summarised as follows:

A. With the approval of the Commission, the Dutch Authorities shall appoint, following a competitive selection procedure, an independent Monitoring Trustee. The Trustee shall only receive instructions from the Commission.

B. The Trustee shall monitor the compliance of NewCo with the Commitments under the Mandate and the present Decision, according to a work plan approved by the Dutch Authorities and the Commission. The Trustee shall report to the Dutch Authorities and the Commission in the ways foreseen by the Mandate.

C. The Trustee shall in particular monitor and verify the effective coverage, by NewCo as a corporation (i.e. not at product level), of all the costs associated with the PALLAS programme ([123]) by the revenues generated from the commercialisation of the various isotopes in the various market segments where NewCo is active (the "Full Cost Coverage Commitment"). The costs in question, and the information to be provided to the Trustee in order to enable the Trustee to monitor and verify, are defined in the Mandate. In case the monitoring and verification are insufficient to ensure compliance with the Full Cost Coverage Commitment, the Trustee may verify whether NewCo is generally not acting as a price leader on the market segments (the "No Lowest Price Leader Commitment").

D. In case the Commitments are not properly implemented and/or complied with, the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedies and notifying them to the Commission for a new approval:

([123]) The Mandate defines the PALLAS programme as follows: "the production of isotopes at the PALLAS-reactor, the marketing and sale of those isotopes to commercial clients, the activities of the Nuclear Health Centre". This definition of the PALLAS programme in the Mandate is different from the one given in recital 3 of the present Decision. This difference simply reflects the fact that the Mandate obviously concerns the activities of the new PALLAS facilities (the reactor and the NHC) once they have been built and have started operations.

1. […].

2. […]:

   i. […].

   ii. […].

[…].

Upon approval by the Commission, the Remedies shall be implemented by the Dutch State. The Trustee shall monitor the execution of the Remedies.

(134) Based on the Trustee Mandate and the Commitments taken therein by the Dutch Authorities, the latter consider that the complainant's doubts about the actual implementation by NewCo of the FCR principle (recital (61)) are unfounded. In addition, the Dutch Authorities consider that the complainant will not operate its own business in compliance with the FCR principle, since the complainant has received from the US Authorities assistance to lower its total costs in the form of both subsidies ([124]) and lease and take-back agreements for its raw materials ([125]). The Dutch Authorities refer in particular to a presentation made by SHINE in August 2023, showing that SHINE is heavily dependent on support from the US Government ([126]). According to the Dutch Authorities, the presentation makes clear that SHINE relied first on funding from the US Department of Defense (in 2009), and that the technical development is now in large part covered by a cooperative agreement with the US National Nuclear Security Administration, a subsidy programme that is run by the US Department of Energy. The presentation explains that development funding provided by the US Department of Energy matches 50% of the funding.

(135) Concerning the costs covered by the PALLAS FCR model, mentioned under point b) of recital (132), the Dutch Government points out that the Dutch GAAP accounting rules (RJ 210.224, sub e) prevent NewCo to capitalise costs related to the PALLAS project until a point in time where there is sufficient certainty that the PALLAS reactor will become operational. An important element in this regard is the financing of the PALLAS project, which needs to be approved by the European Commission. When such approval will have been obtained, NewCo incorporated and the Equity Contribution Agreement and Credit Agreement executed, it is assumed that going forward CapPEx can be capitalised to a large extent (approximately 90%). At that point in time, part of the CapEx (10%) will still be considered to be more general expenses that will also, going forward, be expensed. This is supported by the OECD guidelines on full cost recovery: "*Operators have the responsibility to adhere to the principle of full-cost recovery and to ensure it is implemented,* ***respecting applicable domestic accounting law***

([124]) NNSA awards $35 million to promote U.S. production of critical medical isotope | Department of Energy.

([125]) DOE offices and SHINE sign first-ever contracts under Uranium Lease and Take-back Program to produce domestic Mo-99 | Department of Energy.

([126]) https://arpa-e.energy.gov/sites/default/files/Driven%20Subcritical%20Systems%20SHINEs%20Experience%20and%20Lessons%20Learned.pdf.

and competition rules. *It should be recognised that there may be differences in how such analyses are performed to align with accounting standards and financial reporting.*" (emphasis added) ([127]) In this regard, the Dutch Government indicates that the historical expensed CapEx should be part of the FCR calculations. All CapEx that are capitalised, i.e. from the date of incorporation of NewCo onwards, are included in the FCR calculations via the annual depreciation post-COD. For the non-capitalised (i.e. expensed) CapEx, a pro forma depreciation charge will be included in the FCR calculations. The Dutch Authorities explain that the same holds for interest costs pre-COD, which are pro forma capitalised and depreciated (applying a 40-year depreciation period in line with the overall depreciation of the capitalised costs for the PALLAS project). Finally, given that dividend payments are only expected once the government loans are fully repaid (i.e. after 2049), a proxy for the cost of equity is included in the FCR model of NewCo based on the cumulative equity investment and the IRR of the business case. The proxy for the cost of equity is in line with the expected IRR, that is still as demanded by the Dutch Government. The Dutch Authorities further indicate that the business case results in an estimated project IRR of circa [1-5]% and an equity IRR around [1-5]%. On that basis, the Dutch Authorities further argue that, from a business perspective, there is no incentive to price below FCR levels.

5.4. Contribution to regional development and territorial cohesion

(136) The Dutch Government considers that the PALLAS project is in line with Article 174 TFEU, according to which "*In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions*".

(137) In this regard, the Dutch Government points out that the regional aid map for the Netherlands adopted by the European Commission on 27 January 2022 ([128]) includes the region Kop van Noord-Holland, and in particular the municipality of Schagen. Both the current HFR and the future PALLAS reactor are located in Petten, which is part of the municipality of Schagen.

(138) NRG has an important role in creating and maintaining high-quality employment locally. This concerns approximately 2 000 jobs (1 000 direct, 1 000 indirect) ([129]), which represents about 15% of employment in the municipality of Schagen. With NewCo, this employment is secured in the long term (> 40 years). Furthermore, the project will provide additional jobs during the construction and development of the PALLAS reactor.

(139) NRG also plays an important role in developing and opening up specialist knowledge in the nuclear field. This makes it an important source of knowledge

([127]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012, p. 8.

([128]) SA.100273 Regional aid map for the Netherlands (1 January 2022 – 31 December 2027).

([129]) See the 2020 report by the Dutch National Institute for Public Health and the Environment (RIVM) Supply security for medical radionuclides - additions 2020 (rivm.nl), p. 11.

for universities, other nuclear companies and the Dutch Authority for Nuclear Safety and Radiation Protection (ANVS). NewCo will continue this important contribution to the knowledge economy of the Kop van Noord-Holland.

(140) The Dutch Authorities therefore consider that the PALLAS project will make a significant contribution to the economic development of the Kop van Noord-Holland.

6. ASSESSMENT OF THE MEASURES

6.1. Relationship with the Euratom Treaty

(141) Article 106a(3) of the Euratom Treaty foresees that the provisions of the Treaty on the European Union and of the Treaty on the Functioning of the European Union (TFEU) shall not derogate from the provisions of this Treaty.

(142) Hence, as long as the application of the TFEU does not imply derogations from the Euratom Treaty, the TFEU applies.

(143) In addition, the Dutch Authorities argue that the notified measures should be assessed under Article 107(3)(c) TFEU.

6.2. Existence of State aid

(144) According to Article 107(1) TFEU, State aid is defined as any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods and affects trade between Member States.

(145) It follows that in order for a measure to qualify as State aid, the following cumulative conditions have to be met: (i) the beneficiary of the measure has to be an undertaking, (ii) the measure has to be granted through State resources and be imputable to the State, (iii) the measure has to confer an economic advantage, (iv) which is selective, (v) and has an effect on trade and competition.

(146) The beneficiaries of the proposed measures are, first, the PALLAS Foundation and, once it will be set up, NewCo. Both entities are undertakings as they carry out economic activities consisting in the present implementation (by the PALLAS Foundation) of Phase 1 of the PALLAS project, and in the future implementation (by NewCo) of Phase 2 of the project.

(147) The notified measures involve a transfer of State resources granted by the Dutch Authorities. The legal basis of the notified measures under Dutch law is the Comptabiliteitswet 2016 (Accounts Act 2016), which shows that the measures are imputable to the Dutch State. The funds for the loans and the financing of NewCo come from the Dutch Treasury, which shows that the measures involve State resources (recital (33)).

(148) As the financial situation of the beneficiary is relieved from a cost that would normally be part of its operating budget thanks to the Dutch Authorities' measures, these measures can be considered as procuring an economic advantage to the PALLAS project that the beneficiary could not have obtained under normal market conditions. Further, as the Dutch Authorities' measures are not, as such,

available on the private market, it cannot be argued that the funding provided by the State is in line with the market economy investor principle. The Dutch Authorities indeed acknowledge that, despite efforts to find private investors for the project, no such investor was willing to provide funding due to the high risks and uncertainties involved with the project. Further, the market consultation published by KPMG in July 2021 (mentioned in recital (48)) confirms that private investors are unwilling to take the considerable risks associated with nuclear projects.

(149) Further, the proposed measures are selective as they are provided to specific beneficiaries. As the Court has stated ([130]), where individual aid is at issue, the identification of the economic advantage is, in principle, sufficient to support the presumption that a measure is selective. This is so regardless of whether there are operators on the relevant markets that are in a comparable situation. Whilst the Netherlands has provided or may still provide State aid to other undertakings competing with the beneficiaries, in any event, the notified measures are not part of a broader measure of general economic policy to provide the same type of ad hoc support to undertakings, which are in a comparable legal and factual situation, active in the sector or other economic sectors, but are made available only to the beneficiaries.

(150) By favouring one particular reactor project, the notified measures are liable to distort competition among multipurpose research reactors used for the production of radioisotopes and for the provision of research and irradiation services, as well as with other actual or potential competing technologies. Further, in view of the EU-wide or even global character of the markets involved, the measures would clearly affect trade between Member States.

(151) Finally, the Dutch Authorities do not dispute the classification of the proposed measures as State aid.

(152) However, the Dutch Government puts forward that, in the light of the EU Framework for State aid for research and development and innovation (the "R&D&I Framework") ([131]), part of the research activities carried out by NewCo will be of a non-economic nature and are therefore, under section 2.1.1. ("Public funding of non-economic activities") of the R&D&I Framework, not covered by EU State aid law. More precisely, the Netherlands makes the following statements concerning the relevance of the R&D&I Framework in relation to the notified aid measures:

1) The research activities that are carried out by NRG|PALLAS, as well as the research activities that will be carried out by NewCo, are predominantly of a non-economic nature, aimed at creating more pre-competitive knowledge and understanding of nuclear medicine and the use of nuclear energy, and mostly conducted in effective collaboration with other research organisations. In particular, ca. 80% of the research activities carried out by NRG|PALLAS and then by NewCo, both in the field of nuclear medicine and in the field of

([130]) Case C-15/14 P, *Commission* v *MOL*, EU:C:2015:362, paragraph 60.

([131]) Communication from the Commission "Framework for State aid for research and development and innovation" 2022/C 414/01 (C/2022/7388), OJ C 414, 28.10.2022, p. 1-38.

nuclear energy, do not include the provision of R&D services to undertakings or R&D carried out on behalf of undertakings.

2) In so far as NewCo will provide R&D services to undertakings and will carry out R&D on behalf of undertakings, NewCo will provide these R&D services of an economic nature on the basis of market prices in accordance with section 2.2.1. of the R&D&I Framework. In case of effective collaboration with undertakings, NewCo will comply with section 2.2.2. of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration.

3) As concerns specifically research in the field of nuclear energy, NRG|PALLAS and its successor NewCo can be considered to be a research and knowledge dissemination organisation as defined by the R&D&I Framework ([132]), whose research results are disseminated on a non-exclusive and non-discriminatory basis. In any case, NRG implements a strict separation of economic and non-economic activities (in terms of funding, costs and revenues) so as to avoid any cross-subsidisation of the economic activities of NRG. The same will apply to NewCo as the successor of NRG|PALLAS.

4) As concerns specifically research activities in the field of nuclear medicine, these are currently carried out by NRG|PALLAS via the FIELD-LAB laboratory, which supports the development of new nuclear drugs for cancer treatment by University Medical Centres, start-ups and innovative pharmaceutical companies, and supplies small samples of ready-made radiochemicals for clinical trials. The research activities carried out in the FIELD-LAB are not independent, but do include effective collaboration as defined in the R&D&I Framework ([133]). In any case, NRG implements a strict separation of economic and non-economic activities (in terms of funding, costs and revenues) so as to avoid any cross-subsidisation of the economic activities of NRG. The same will apply to NewCo as the successor of NRG|PALLAS.

([132]) Under paragraph 16(ff) of the 2022 R&D&I Framework, "*'research and knowledge dissemination organisation' or 'research organisation' means an entity (such as universities or research institutes, technology transfer agencies, innovation intermediaries, research-oriented physical or virtual collaborative entities), irrespective of its legal status (organised under public or private law) or way of financing, whose primary goal is to independently conduct fundamental research, industrial research or experimental development or to widely disseminate the results of such activities by way of teaching, publication or knowledge transfer. Where such entity also pursues economic activities, the financing, the costs and the revenues of those economic activities must be accounted for separately. Undertakings that can exert a decisive influence upon such an entity, for example in the quality of shareholders or members, may not enjoy a preferential access to the results generated by it.*".

([133]) Under paragraph 16(h) of the 2022 R&D&I Framework, "*'effective collaboration' means collaboration between at least two independent parties to exchange knowledge or technology, or to achieve a common objective based on the division of labour where the parties jointly define the scope of the collaborative project, contribute to its implementation and share its risks, as well as its results. One or several parties may bear the full costs of the project and thus relieve other parties of its financial risks. Contract research and provision of research services are not considered forms of collaboration.*".

(153) As regards the alleged non-economic nature of part of the research activities carried out by NewCo, the Commission observes the following:

- Based on the information provided by the Netherlands, it indeed appears that some of the research activities carried out by NewCo will be of a non-economic nature. However, based on the information provided by the Netherlands, the Commission is unable to estimate exactly how much of the research activities carried out by NewCo will be of a non-economic nature.

- In any case, while NewCo will be an important player in nuclear research, the Netherlands indicates that, compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production. This is confirmed by data submitted by the Dutch Authorities, according to which NewCo's operational costs related to R&D&I are estimated to vary between [5-30]% and [5-30]% of the overall operational costs.

In light of the above considerations, the Commission acknowledges that part of the research activities carried out by NewCo will be of a non-economic nature.

(154) In view of the above, the proposed measures constitute State aid within the meaning of Article 107(1) TFEU.

6.3. Lawfulness of the aid

(155) In accordance with Article 108(3) TFEU and Article 3 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union ([134]), notifiable aid shall not be put into effect before the Commission has taken, or is deemed to have taken, a decision authorising such aid.

(156) On 26 June 2024, the Dutch Authorities notified two measures, namely A) some already granted loans not covered by the 2013 Decision and B) a public funding of NewCo.

(157) As regards the measure under A), it consists of loans that have already been granted to the PALLAS Foundation in the period 2019-2024 prior to the notification. Therefore, these loans must be considered to be unlawful aid, granted in breach of the standstill obligation under Article 108(3) TFEU and Article 3 of Council Regulation (EU) 2015/1589.

(158) As regards the measure under B), it consists of a public financing of a NewCo that has not been implemented prior to the notification. In addition, by e-mail of 28 June 2024, the Dutch Authorities clarified that the standstill obligation will be respected as no aid will be granted prior to the date of adoption of the Commission decision.

6.4. Compatibility of the aid

(159) The Dutch Government considers that the notified aid measures are compatible with the internal market, based on Article 107(3)(c) TFEU according to which

([134]) OJ L 248, 24.9.2015, p. 9-29.

"*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest*" may be considered to be compatible with the internal market.

(160) The Commission agrees that the compatibility of the notified measures is to be assessed under Article 107(3)(c) TFEU, since they do not fall within the scope of application of any specific guidelines. The Commission will therefore assess whether the notified measures i) facilitate the development of an economic activity or of an economic area (positive condition), and ii) do not adversely affect trading conditions to an extent contrary to the common interest (negative condition).

6.4.1. Positive condition: the aid must facilitate the development of an economic activity or of an economic area

6.4.1.1. The economic activity and the economic area supported by the aid

(161) As mentioned in recitals (4) to (10), the aid notified by the Dutch Authorities aims to support the construction of the PALLAS project, which includes a new reactor (PALLAS), as a replacement for the existing HFR, and an isotope processing facility, the NHC. The HFR, which is one of the world's largest suppliers of medical radioisotopes, is planned to close in the early 2030s. The PALLAS reactor will replace the HFR and will be used mainly for the production of medical isotopes, as well as for the production of industrial isotopes and for the provision of research and other services (multipurpose reactor). More particular, according to projections submitted by the Dutch Authorities, the NewCo that will build and operate the PALLAS project (including both the PALLAS reactor and the NHC) will have on average the following revenue percentages in the period 2033-2035: [50-80]% from the production and processing of medical isotopes; [1-5]% from the production of industrial isotopes; [15-30]% from research and other services, where the research activities represent [1-5]% of the revenues.

(162) The information summarised in recital (161) shows that the main economic activity supported by the aid is the production and processing of medical isotopes.

(163) In addition, as mentioned in recitals (136) to (140), both the current HFR and the future PALLAS project (including the reactor and the NHC) are located in the region Kop van Noord-Holland, and in particular in the municipality of Schagen which is included in the regional aid map for the Netherlands adopted by the European Commission on 27 January 2022 ([135]).

(164) The information summarised in recital (163) shows that the economic area supported by the aid is the region of Kop van Noord-Holland and, in particular, the municipality of Schagen.

([135]) SA.100273 Regional aid map for the Netherlands (1 January 2022 – 31 December 2027).

6.4.1.2. The aid facilitates the development of the economic activity and of the economic area

(165) The PALLAS project (including both the PALLAS reactor and the NHC) will be used mainly for the production and processing of medical isotopes. This shows that the aid aims at facilitating the development of the economic activity identified in recital (162), i.e. the production and processing of medical isotopes. In fact, as shown in particular in recitals (46) and (48), because private investors are unwilling to take many of the risks associated with the construction of a nuclear reactor project such as PALLAS, the latter would not materialise without the notified State aid measures.

(166) In addition, as explained by the Dutch Authorities (recitals (138) to (140)), both NRG (which operates the current HFR) and NewCo (which will operate the PALLAS reactor and the Nuclear Health Centre) have an important role in creating and maintaining high-quality employment in the region of Kop van Noord-Holland and, in particular, in the municipality of Schagen. This shows that the aid will facilitate the development of the economic area identified in recital (164), i.e. the region of Kop van Noord-Holland and, in particular, the municipality of Schagen.

(167) In light of recitals (165) and (166), the Commission concludes that the aid measures facilitate the development of the economic activity and of the economic area identified.

6.4.1.3. The aid and the activity comply with relevant EU laws

(168) State aid measures cannot be declared compatible with the internal market if the supported activity or the aid measure or the conditions attached to it entail a violation of relevant Union law.

(169) As shown in recitals (55) to (67), the Commission has received a formal complaint by the company SHINE alleging that the State aid supporting the PALLAS project may not be justified by the need to remedy a market failure and is likely to cause significant distortions to competition, which could be mitigated only if PALLAS implements the full cost recovery principle. As the complainant's allegations concern the issue whether the State aid in favour of the PALLAS project does, or does not, adversely affect trading conditions to an extent contrary to the common interest, the Commission will address the complainant's allegations further below in the section "Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

(170) As indicated in recitals (70) and (71), the Commission has also received a letter by the company NorthStar and by the U.S. Mission to the European Union. These letters put forward that the Commission, when assessing State aid in favour of the PALLAS project, should take into account the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical radioisotopes by implementing the full cost recovery principle. Since these letters are not formal complaints, but merely market information, the Commission does not need to specifically address them. However, since the issue of the implementation of the full cost recovery principle is also raised by SHINE in its complaint, this issue will in fact be assessed below in the section "Negative

condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

(171) Finally, as regards EU rules not related to the protection of fair competition, the Commission has not received any complaints or information that might lead to the conclusion that the State aid in favour of the PALLAS project, the conditions attached to it, or the economic activities facilitated by the aid, are contrary to provisions of Union law. In fact, the general concerns about the environmental impacts of the PALLAS reactor, expressed in the citizens' letters of October 2022 (recitals (68) and (69)) ([136]), are not such as to call into question the results of the environmental impact assessments to which the PALLAS project has been subjected (recital (14)). In addition, the information submitted by the Dutch Authorities do not show that the aid, the conditions attached to it, or the economic activities facilitated by the aid, entail a violation of relevant Union law. Moreover, the Commission has not sent any reasoned opinion to the Netherlands on a possible infringement of Union law that would bear a relation to this case.

(172) It follows from the above that the aid in favour of the PALLAS project does not breach any relevant provision of Union law, without prejudice to the assessment of SHINE's complaint here below in the section "Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

6.4.2. Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest

6.4.2.1. The market affected by the aid

(173) As mentioned in recital (9), the PALLAS reactor will produce medical isotopes for both diagnostic and therapeutic purposes.

(174) The market affected by the aid is therefore the worldwide market for medical isotopes, both diagnostic and therapeutic, described in recitals (35) to (54).

6.4.2.2. The positive effects of the aid measures

(175) As explained in recital (165), the aid to the PALLAS project will facilitate the development of the economic activity identified, i.e. the production and processing of medical isotopes.

(176) Besides its positive effect for the supported economic activity, the aid will have positive effects for society at large and the Union as a whole. In this regard, the Commission observes the following:

a) As shown in recitals (43), (44) and (52), a 2014 report by the European Observatory on the Supply of Medical Radioisotopes ([137]) concluded that the existing European network of reactors is fundamental to ensure the supply of medical radioisotopes, thereby making it necessary to undertake investments to refurbish the current fleet and to replace the capacity that will be lost as the

([136]) These letters are not formal complaints, but merely market information.

([137]) WG4_Report.pdf (europa.eu).

operating reactors reach the end of their lifespan ([138]). This finding of the Observatory was confirmed by two 2021 reports prepared for the European Commission, namely the NucAdvisor study ([139]) and the Technopolis study ([140]), both of which concluded that, if the EU's aging production capacity is not replaced in time, the EU will become increasingly dependent on countries outside Europe. In particular, the NucAdvisor study concluded that, to reduce the risk of supply shortages and to minimise EU dependence on countries outside Europe, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems such as SHINE, at least one new reactor ([141]). The PALLAS project supported by the Dutch Government aims precisely at building such a new reactor.

b) As explained in recital (54), besides the PALLAS project supported by the Dutch Government, several European countries (France, Belgium, Germany) are investing in new research reactors for the production of medical isotopes. However, since these reactors will be primarily aimed at research, their capacity to produce medical isotopes on a large scale is limited by the capacity needed for the research activities. This is why, according to the NucAdvisor and the Technopolis studies, the combined capacity of these new reactors, which are being developed in European countries other than the Netherlands, will be insufficient to meet European demand for both diagnostic and therapeutic isotopes ([142]). The additional capacity brought about by the PALLAS reactor is therefore needed to fill the expected supply gap.

c) While, compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production, the PALLAS reactor will still continue many of the R&D&I activities already carried out in the HFR. In particular, PALLAS will collaborate with pharmaceutical companies that are developing new isotopes-based medicines (recital (89)). In addition, PALLAS will contribute to R&D&I in the continued safe operation of existing nuclear power plants, in the development of small modular reactors (SMRs) and in promising Generation IV designs such as thorium-fuelled molten salt reactors and high temperature reactors (recital (90)).

The above shows that the PALLAS project, by producing medical isotopes (needed to diagnose and treat life-threatening diseases including cancer) and by supporting R&D&I in nuclear medicine, will contribute to health protection by reducing the risk of shortages in the supply of medical isotopes, thereby benefiting patients in and outside Europe, and will minimise EU dependence on

([138]) This finding of the Observatory was included in the conclusions of a 2015 report by the Euratom Supply Agency (Activities following up the Council Conclusions of 15 December 2009 on the Security of Supply of Radioisotopes for Medical Use and the Council Conclusions of 6 December 2010 and 7 December 2012 'Towards the Secure Supply of Radioisotopes for Medical Use in the European Union' (europa.eu)).

([139]) Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com).

([140]) Study on sustainable and resilient supply of medical radioisotopes in the EU - Therapeutic Radionuclides (technopolis-group. com).

([141]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([142]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

countries outside Europe in the field of medical isotopes. The Commission observes that ensuring security of supply of medical isotopes and minimising the EU's reliance on foreign supply are objectives pursued by the EU in the framework of the European Observatory on the Supply of Medical Radioisotopes (see recital (42)) and in the context of the SAMIRA action plan (see recital (45)). The same objectives are also pursued by other international organisations such as the OECD-NEA (see recital (41)). Furthermore, the PALLAS project, by supporting R&D&I in the continued safe operation of existing nuclear power plants and in the development of new nuclear power generation technologies, will additionally contribute to EU research in the field of nuclear power generation. The Commission observes that such contribution is in line with the objectives of the Euratom Treaty, in particular as concerns the promotion of nuclear research (Article 2(a) of the Euratom Treaty), ensuring nuclear safety (Article 2(b) of the Euratom Treaty) and facilitating investment into nuclear installations for development of nuclear energy (Article 2(c) of the Euratom Treaty).

(177) Based on the assessment in recital (176), the Commission therefore finds that the PALLAS project will contribute to the strategic autonomy of the EU in the field of medical isotopes and to EU research in the field of nuclear power generation.

(178) As regards the main diagnostic isotope Mo-99, the complainant states (recital (63)) that the implementation of the SHINE technology would make PALLAS not indispensable and, therefore, that PALLAS is not needed to ensure security of supply and Europe's self-sufficiency. In this regard, the Commission points out that, in the same meeting report quoted by the complainant, the paragraphs immediately after the ones referenced by the complainant ("the additional paragraphs") read as follows: "*But if only SHINE comes, there will be little wiggle room between demand and production capacity. This should be included in the margin of 35% (used for outages). Then you see that SHINE adds quite little leeway to this. Another nuance is the increasing demand for therapeutic isotopes. The chance of a capacity shortage is greater there (if only SHINE arrives). We still know too little about these factors. 5.i.2e indicates that it is important to know how likely it is that SHINE will actually get off the ground. This is a different analysis than we have seen so far. 5.1.2e adds that we must also see whether SHINE actually has a chance of success. There is still a lot of concern about this. 5.1.2e indicates that everyone who speaks to the Ministry of Health (outside SHINE) has major doubts about the chance of success.*" ([143]). The Commission observes that a joint consideration of both the paragraphs referenced by the complainant and of the additional paragraphs (the "complete text") shows that the opinion "if SHINE succeeds, the PALLAS reactor is not indispensable to ensure security of supply of Mo-99 in Europe" was nuanced in the meeting by the

([143]) These paragraphs (immediately after the text referenced by the complainant) read as follows in the original Dutch: "*Maar als alleen SHINE er komt, zit er weinig speelruimte tussen de vraag en productiecapaciteit. Dit zou meegenomen moeten zijn in de marge van 35% (die gehanteerd wordt voor uitval). Dan zie je dat SHINE hier vrij weinig speelruimte aan toevoegt. Een andere nuance is de toenemende vraag naar therapeutische isotopen. De kans op capaciteitstekort is daar groter (bij alleen komst van SHINE). Van deze factoren weten we nu nog te weinig van af. 5.i.2e geeft aan dat het van belang is om te weten hoe groot de kans is dat SHINE daadwerkelijk van de grond komt. Dit is een andere analyse dan we tot dusver hebben zien. 5.1.2e voegt hier aan toe dat we ook moeten kijken of SHINE daadwerkelijk een kans van slagen heeft. Er is nog veel zorg hierover. 5.1.2e geeft aan dat iedereen die VWS spreekt (buiten SHINE) grote twijfels heeft over de kans van slagen.*".

opinion "if only SHINE succeeds, there will be little room for manoeuvre between demand and production capacity" as well as by the opinion "there are major doubts about SHINE's chances of success". Second, the Commission observes that, since the opinions reflected in the complete text mainly concern *one isotope* (namely Mo-99) ([144]), those opinions cannot call into question the NucAdvisor study's conclusion that, to reduce the risk of supply shortages and to minimise EU reliance on foreign supply concerning *all necessary isotopes*, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems (such as SHINE), at least one new reactor (such as PALLAS) ([145]). In this regard, the Commission reminds that, while a nuclear research reactor (such as PALLAS) can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging technologies (such as SHINE) ([146]). Therefore, the production scope of emerging technologies (such as SHINE) is not as large as the production scope of a nuclear research reactor (such as PALLAS).

(179) Also as regards the main therapeutic isotope Lu-177, the complainant states (recital (64)) that PALLAS is unnecessary to ensure security of supply and Europe's self-sufficiency. According to the complainant, this is shown in the 2022 report "Production of ^{177}Lu using the SHINE technology" by the University of Delft ("the Delft report") ([147]), which has allegedly concluded that SHINE's planned production capacity of Lu-177 will be sufficient to supply the market (which is, at least, EU-wide or even global). In this regard, the Commission takes note that the conclusions in the Delft report read as follows: "*the TU Delft team regards production of sufficient amounts of high specific activity ^{177}Lu from the enriched ^{176}Yb production route using SHINE enrichment and separation technology as feasible*" ([148]). The Delft report further states that "*SHINE technology […] has two main advantages: a high quality ^{177}Lu, and the principal possibility to be backed up by (European) low flux research reactors for irradiation (ANNEX 13) if needed (ensuring EU delivery). Although SHINE's production process is a relatively complex one, its capacity is large at full operation. Thus, seen in terms of quality, capacity and back-up options, the TU Delft team regards SHINE technology as highly effective.*" ([149]). However, the Commission observes that the Delft report does not state that SHINE's planned production capacity of Lu-177 will be sufficient to supply the global market. In fact, the Delft report, after having estimated the annual demand for Lu-177 at ca.

([144]) The paragraphs referenced by the complainant discuss only the diagnostic isotope Mo-99, while the additional paragraphs broaden the discussion by considering therapeutic isotopes ("*Another nuance is the increasing demand for therapeutic isotopes. The chance of a capacity shortage is greater there (if only SHINE arrives).*"). However, the focus of the complete text remains Mo-99, also because at the time of the discussion (4 December 2020) it was thought that SHINE could not produce therapeutic isotopes (such as Lu-177). The fact that, based on the 2022 Delft report, it is now thought that SHINE can produce the therapeutic isotope Lu-177, is discussed below in recital (179).

([145]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([146]) NucAdvisor 2021, p. 153.

([147]) This report by the Reactor Instituut Delft of the University of Delft is available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

([148]) Page 12 of the Delft report.

([149]) Page 13 of the Delft report.

300 000 to 400 000 patient doses worldwide by 2040 ([150]), finds that SHINE's claim to be able to produce 250 000 patient doses annually is realistic ([151]). This means that, even in the case where SHINE will actually achieve it production target of 250 000 patient doses annually, this production will be lower than the estimated demand of ca. 300 000 to 400 000 patient doses worldwide by 2040. The Commission further observes that, until SHINE starts production based on its innovative technology and ramps it up to full operation ([152]), it cannot be taken for granted that SHINE will be successful ([153]). Finally, the Commission observes that, since it concerns only *one isotope* (namely Lu-177), the Delft report cannot call into question the NucAdvisor study's conclusion that, to reduce the risk of supply shortages and to minimise EU reliance on foreign supply concerning *all necessary isotopes*, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems (such as SHINE), at least one new reactor (such as PALLAS) ([154]). In this regard, the Commission reminds again that, while a nuclear research reactor (such as PALLAS) can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging technologies (such as SHINE) ([155]). Therefore,

([150]) Page 15 of the Delft report: "*NUC (2021) envisages current EU demand as 10 000 patient doses annually (7.4 GBq each, standard treatment consists of 4 doses per patient), and anticipates a growth in demand that leads to > 100 000 doses annually per radiopharmaceutical in 2040. Worldwide, in all available info (literature, open sources) the general opinion is that a reasonable estimate is very difficult to substantiate, a best guess based on current knowledge could be ca. 300 000 a 400 000 patient doses worldwide by 2040.*"

([151]) Page 13 of the Delft report: "*SHINE claims to be able to produce 250 000 patient doses annually. This claim is considered by the TU Delft team as realistic (see ANNEX 15).*". See also page 17 of the same report: "*SHINE Medical Technology intends to produce 250 000 patient doses per year. Based on the information SHINE shared with the TU Delft team, and subsequent calculations by the TU Delft team based on this information, this should be achievable using the SHINE facilities, enrichment procedures and separation technology (see ANNEX point 15).*".

([152]) As explained in the Delf report (section "13. SHINE processing and distributing of either reactor-based ^{177}Lu, or SHINE-facility produced ^{177}Lu", page 18), SHINE, besides developing its innovative technology allowing to produce medical isotopes without a research reactor, can also rely on research reactors to produce medical isotopes. However, such a reactor-based production is only a back-up option, because SHINE aims to fully deploy its innovative technology that will not depend on research reactors (Delft report, page 13). For the time being and as of 2024, SHINE has been producing Lu-177 in the US based on the irradiation capacity of the Missouri University Research Reactor (thereby making use of the back-up option). However, SHINE has not yet started production based on its innovative technology that will not depend on research reactors.

([153]) As indicated by the NucAdvisor and Technopolis studies, innovative projects such as SHINE, despite promising extrapolations from laboratory experiments or validation of their individual components, still lack experience feedback of their first full scale industrial production. Until such feedback becomes available, it is not possible to assess in a compelling manner whether these novel technologies will be sufficiently competitive with nuclear research reactors (in terms of costs, production yields, reliability, product quality, etc.), thereby offering a valid industrial alternative (NucAdvisor 2021, p. 108). In particular, the SHINE project differs greatly from the current reactors and is based on innovative technologies, combining in an integrated manner nuclear, reprocessing and chemical processes, that still necessitate demonstration at full industrial scale (NucAdvisor 2021, p. 87, p. 98; Technopolis 2021, p. 58). Therefore, the Technopolis study concludes that these alternatives "*provide an innovative, but hardly proven option that requires time to scale up to global demand*" (Technopolis 2021, p. 63).

([154]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([155]) NucAdvisor 2021, p. 153.

the production scope of emerging technologies (such as SHINE) is not as large as the production scope of a nuclear research reactor (such as PALLAS).

(180) The complainant states (recital (65)) that, since the HFR produces Lu-177 by using Yb-176 sourced in Russia and since the PALLAS reactor (as the successor of the HFR) will probably do the same, the production of Lu-177 by the PALLAS reactor risks prolonging Europe's strategic dependency on Russia as regards the sourcing of Yb-176, thereby contradicting the idea that the PALLAS project serves the strategic autonomy of Europe. In this regard, the Commission observes, first, that it is not always feasible, or necessary, that an aided project establishes adequate strategic autonomy along the entire value chain of the strategic goods in question. The PALLAS reactor will contribute to European strategic autonomy in relation to the medical isotopes administered to patients. Second, while the project does not directly address strategic autonomy for the inputs used in the production of medical isotopes, the PALLAS project, by carrying out research into recycling technology for the re-use of Yb-176 targets, will contribute to reducing the use of new Yb-176 sourced in Russia. In addition, there is no reason to consider that the PALLAS reactor will not use alternative sources of Yb-176 when they become available.

(181) Based on the assessment in recitals (178) to (180), the Commission therefore confirms its finding in recital (177) that the PALLAS project will contribute to the strategic autonomy of the EU in the field of medical isotopes.

(182) The Dutch Authorities explain that the notified aid measures pursue three more objectives of common interest, namely: contributing to the mitigation of climate change (recitals (93) and (94)), limiting transport of nuclear materials in the EU (recital (95)) and promoting nuclear non-proliferation (recital (100)). The Commission observes that contributing to the mitigation of climate change is an objective pursued by the EU, in particular in the framework of the Taxonomy Regulation. The Commission further observes that limiting transport of nuclear materials and promoting nuclear non-proliferation are in line with the objectives of the Euratom Treaty, in particular as regards ensuring nuclear safety (Article 2(b) of the Euratom Treaty), and ensuring that nuclear materials are not diverted to purposes other than those for which they are intended (Article 2(e) of the Euratom Treaty).

(183) The assessment in recitals (176) to (182) shows that the aid in favour of the PALLAS project will have positive effects for society at large and the Union as a whole.

(184) This conclusion is not affected by the fact that some of the planned activities of the PALLAS multipurpose nuclear reactor may not relate to all the above objectives (e.g. the production of industrial radioisotopes is not relevant from the point of view of health protection). First, each of the planned activities is relevant from at least one of the above objectives (e.g. with respect to the production of industrial radioisotopes, the limitation of the transport of nuclear material and the promotion of non-proliferation remain valid objectives). Second, the multipurpose character is a standard feature of nuclear reactors used to produce isotopes, which

ensures an efficient utilisation of the reactor and diversification of revenue sources to cover its operating costs ([156]).

6.4.2.3. The negative effects of the aid on the internal market

6.4.2.3.1. Assessing how the aid minimises the distortions of competition and trade

a) Necessity of the aid

(185) The Dutch Authorities have made several attempts to attract private financing for the PALLAS project. These attempts were made first by ECN-NRG (recital (17)) and then by the PALLAS Foundation (recital (21), recitals (79) to (82)). The fact that all these attempts failed indicates that, without the notified aid measures, the PALLAS project would not materialise.

(186) This is also confirmed by the market consultation about nuclear power plants published by KPMG in July 2021 (recital (48)), which shows that, although private investors are willing to take some construction risks, they are not willing to take many of the other risks associated with nuclear reactor projects, notably black swan, regulatory and licence risks. The Commission's decision-making practice has also consistently recognised that investments into new nuclear projects were subject to market failures which called for State intervention, with respect to the scale of capital requirements, the longevity of exposure to market pricing signals and the longevity of exposure to varying political decisions ([157]).

(187) In addition, the failure of the attempts made to attract private financing for the PALLAS project is in line with the reports mentioned in recitals (46) and (47) of the present Decision, which show that prices for the irradiation of medical isotopes have been and still are too low for private investors to construct new research reactors to produce medical isotopes on a commercial basis.

(188) The NucAdvisor study ([158]) also indicates that, for large medical isotope production facilities, fully private initiatives might not be practicable, due to the known difficulty of implementing full cost recovery, the high investment costs and the relatively long durations for design, construction and licensing (pre-production).

(189) Based on the assessment in recitals (185) to (188), the Commission therefore finds that the aid in favour of the PALLAS project is necessary.

(190) The complainant states (see recital (66)) that the aid to the PALLAS project is not necessary because the market is already ensuring the production of key medical

([156]) See e.g. the Commission Staff Working Document accompanying the Commission Communication on medical applications of ionizing radiation and security of supply of radioisotopes for nuclear medicine of 6.8.2010, p. 14. (https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2010:0974:FIN:EN:PDF).

([157]) See the following Commission decisions: SA.58207, Dukovany, recitals 404-419; SA.38454, Paks II, recitals 303-313; SA.100338 Nuward 1, recital 112; SA.106964, Nuward 2, recital 106; SA.34947 Hinkley Point C, recital 89.

([158]) See e.g. NucAdvisor 2021, p. 18, p. 146, p. 156.

isotopes in the EU even without any State support, as demonstrated e.g. by the SHINE project. In this regard, the Commission observes that private investors' willingness to build projects such as SHINE, which use technologies other than nuclear research reactors, can call into question neither the above finding that private investors are not willing to take many of the risks associated with nuclear reactor projects (recital (186)), nor the above finding that prices of medical isotopes are too low for private investors to construct new nuclear reactors such as PALLAS (recital (187)).

(191) The complainant considers that, given the existing plans for the construction of additional capacity in Europe and in the world, there will be sufficient Mo-99 production capacity to cover the estimated worldwide demand (including the recommended outage reserve capacity), even without the PALLAS reactor. The complainant states that, even if some of that additional capacity did not materialise as planned, there is the potential to prolong the operation of some of the reactors that are currently foreseen to be decommissioned. Based on its opinion that there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant holds that the State aid in favour of the PALLAS project may not be justified by the need to remedy a market failure (see recital (62)). In this regard, the Commission observes that it cannot be taken for granted that it will be possible to prolong the operation of some of the reactors that are planned to be closed. The Commission further observes that the data referred to by the complainant concern additional capacity planned *in the whole world* (including Europe) for the production of *one isotope* (namely Mo-99), which cannot call into question the NucAdvisor study's conclusion that the construction of at least one new research reactor *in Europe* is needed to minimise EU reliance on foreign supply concerning *all necessary isotopes* ([159]).

(192) The complainant further considers (recital (62)) that, even assuming that State aid in favour of the PALLAS reactor (the main element of the PALLAS project) may be justified by the need to remedy a market failure, such a market failure however does not exist as regards a processing facility like the Nuclear Health Centre (the other element of the PALLAS project), because, in the complainant's view, a facility like the Nuclear Health Centre (as opposed to a reactor) can be built without major technical and financial difficulties. Therefore, in the complainant's view, any State aid to the PALLAS reactor should not be extended to the Nuclear Health Centre. In this regard, the Commission observes that, as explained by the Dutch Authorities (recital (95)), a major constraint in the supply chain of medical isotopes is their radioactive decay. Logistical efficiency and just-in-time delivery are essential for the economic sustainability of the global supply chain. The Energy & Health Campus in Petten, the location of the current HFR and of the future PALLAS reactor, is a unique site in Europe where both irradiation facilities (HFR/PALLAS reactor) and processing facilities for diagnostic medical isotopes (the Molybdenum Processing Facility ([160])) are located. With the Nuclear Health

([159]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([160]) The Molybdenum Processing Facility (MPF) is owned by the NRG and operated by Curium, the world's largest nuclear medicine company. Curium, as a separate legal entity with its own governance structure related to its private equity ownership, is completely independent from the HFR. In the MPF at Petten, Curium processes not only Uranium targets irradiated in the HFR, but also Uranium targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland.

Centre (NHC), at the same site there will also be processing facilities for therapeutic isotopes ([161]). This makes sure that transport of radioactive material across Europe can be minimised and optimised, which contributes to safety and security for EU citizens. In addition, as explained by the Dutch Authorities (recital (97)), while "dedicated" processing facilities (i.e. processing facilities developed by pharmaceutical companies exclusively for their specific medical isotopes which have already passed all relevant testing and registration requirements) may indeed be attractive for private investors, the NHC will not be such a dedicated facility. Finally, as explained by the Dutch Authorities (recital (98)), the inclusion of the NHC in the PALLAS project makes sense from a financial viewpoint, because the revenues of the NHC will shorten by two years the payback period of the public loans granted to NewCo. Therefore, the Commission concurs with the Dutch Authorities that it is necessary to support the PALLAS project as a whole comprising both the PALLAS reactor and the NHC.

(193) Based on the assessment in recitals (190) to (192), the Commission therefore confirms its finding in recital (189) that the aid in favour of the PALLAS project is necessary.

b) Appropriateness of the aid

(194) As shown above (recitals (185) to (193)), because private investors are unwilling to take many of the risks associated with the construction of a nuclear reactor project such as PALLAS, the latter would not materialise without the notified State aid measures.

(195) Since, absent the State aid, the PALLAS project would not be built, the Commission considers that there is in practice no alternative policy instrument that the Dutch Authorities could implement to fully achieve all the objectives of the PALLAS project identified in recitals (176) to (183). In particular, if the PALLAS project is not built, the objectives of strengthening the strategic autonomy of the EU in the field of medical isotopes and promoting EU research in the field of nuclear power generation could not be achieved.

(196) Indeed, even ignoring the demonstrated failure to attract private market operators to finance the project, possible alternative public policy tools such as public-private partnerships (PPPs) or other regulatory incentives could not have been considered as appropriate to fully achieve the objectives of the PALLAS project for the following reasons:

- As regards PPPs, while they can sometimes be a less distortive form of support than direct State aid, in the case of nuclear reactors, the risks and capital requirements might still deter private investors and partners.

- As regards other regulatory incentives such as tax incentives, guarantees or favourable tariff structures, such measures may still prove insufficient and/or inadequate in attracting sufficient private investment if the underlying risks remain unaddressed.

([161]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

- As regards other possible non-financial interventions such as, typically, administrative support, while streamlining administrative processes or providing technical assistance can facilitate investments, they are unlikely to mitigate the financial barriers and/or bridge significant financial gaps and therefore constitute a genuine alternative to direct State aid.

(197) The same conclusion applies when other direct State aid measures are considered as possible alternatives to the notified loans and equity measures, for the following reasons:

- As regards grants, while they are a common form of State aid, they can be more distortive as they do not need to be repaid and therefore might be seen as providing undue advantage over competitors thus leading to significant distortions in the market.

- As regards government guarantees on loans, while they can mitigate investment risks and attract private financing, their effectiveness is limited if the market perceives the inherent risks of the (nuclear) project to be too high. In addition, guarantees do not provide upfront capital, which is essential for such capital-intensive projects.

- As regards tax incentives, while benefiting from tax breaks or incentives can reduce the financial burden on the project, tax incentives alone may not provide the immediate capital needed and often fail to address the high-risk nature of investments such as the PALLAS project.

(198) Compared to the possible alternatives considered above in recitals (196) and (197), direct government investments through loans and equity, such as the ones designed by the Dutch Authorities for the PALLAS project, ensure that a project is adequately funded from the outset, addressing both the capital requirement and the risk mitigation needed to make such projects viable and capable of reaching completion. In addition, loans and equity, such as the ones designed by the Dutch Authorities for the PALLAS project, involve a financial commitment that typically requires repayment in the form of interests and dividends, which contribute to making the project less distortive of competition.

(199) In this context, the Commission considers that the [20-60]%/[40-80]% long-term debt-to-equity ratio that will be used to finance the PALLAS project is appropriate for the following main reasons:

- Debt financing typically has a lower cost of capital compared to equity. This is because debt holders have a prior claim on the company’s assets and income, which makes debt less risky from the lender’s perspective and therefore cheaper. In addition, interest payments on debt are usually tax-deductible, which can provide significant tax benefits to the company, reducing the overall cost of capital. Furthermore, for a capital-intensive project like a nuclear reactor, long-term debt can be appropriate because the project is expected to generate stable and predictable cash flows once operational. This stability makes it feasible to service debt over the long term.

- Unlike debt, equity financing does not require immediate repayment. This can be crucial during the initial years of the project when the company might not yet be generating sufficient cash flows to cover large debt payments. In addition, by

financing [40-80]% of the project with equity, the Dutch Authorities ensure that there is a substantial buffer to absorb any cost overruns, delays, or operational challenges (which are common in large infrastructure projects) as equity investors absorb more risk compared to debt holders.

- The [20-60]%/[40-80]% debt-to-equity ratio is a common structure in the financing of large infrastructure projects, including energy projects. This ratio strikes a balance between leveraging the project sufficiently to make it financially viable while maintaining a solid equity base to mitigate risks.

- Overall, given the high operational risks associated with nuclear reactors, a balanced debt-to-equity ratio, such as [20-60]%/[40-80]% in the case of the PALLAS project, ensures that the company maintains financial stability and flexibility. A higher equity ratio would imply a higher total cost of capital, while a higher debt ratio would increase financial risk and potential insolvency risks.

(200) It is against this background that the appropriateness of the issuance and refinancing of the loans that were granted until the incorporation of NewCo must be assessed. Indeed, as explained above (recitals (196) and (197)), no other public policy tool or measure would have been more appropriate than such loan financing while the Dutch Authorities were trying to raise private funding for the project, which eventually proved to be unsuccessful. Now that the complete funding structure of the PALLAS project has been put in place, those loans, that are already scheduled to be refinanced into long-term debt, will purposely find their place in the [20-60]%/[40-80]% long-term debt/equity financing structure, and thereby efficiently complement the other funding instruments.

(201) On the basis of all the above, the Commission concludes that the [20-60]%/[40-80]% combination of long-term debt and equity, including the refinancing of the loans that were granted until the incorporation of NewCo, is a balanced approach that supports the project's long-term success and must be considered as appropriate for the financing of the PALLAS project due to its ability to balance risk, cost of capital and financial stability, in particular acknowledging that, without such financial contributions, the project would not materialise.

(202) In the light of the considerations in recitals (195) to (201), the notified aid represents an appropriate instrument for achieving the identified objectives.

c) Proportionality of the aid

(203) The principle of proportionality requires that the aid measures do not exceed what is appropriate in order to attain their objectives. Thus, if the planning and construction of the PALLAS project could be achieved with less aid, then the aid would not be considered proportionate.

(204) The Commission determines the maximum aid level with regard to the identified funding gap. The funding gap refers to the difference between the positive and negative cash flows over the lifetime of the investment, discounted to their current value on the basis of an appropriate discount factor reflecting the rate of return necessary for the beneficiary to carry out the project notably in view of the risks involved.

(205) The Dutch Authorities provided a funding gap analysis for the project and limited the aid so that it does not exceed the funding gap. Although, from a procedural point of view, the measures subject of the present Decision can be seen as two separate sets of measures, insofar as they consist, on the one hand, of non-notified measures concerning the past and, on the other hand, of notified measures concerning the future, it is however clear that from, a substantive point of view, the whole public intervention refers to the preparation, the construction and the operation of a single and indivisible project. The assessment of the Commission will therefore consider the project as a whole.

(206) The funding gap analysis is based on a 52-year business plan (for the years between 2019 and 2070) (recital ((105)). The length of the business plan period includes 5 years and a half of preparation phase (until the date of incorporation of NewCo set in the Financial Model at 1 July 2024), 6 and a half years of construction phase, two years of transition in which the production will be shifted to the PALLAS reactor, and 38 years, from 2033 onwards, in which NewCo will be generating revenues from the PALLAS reactor and NHC.

(207) The Commission considers it credible that NewCo would not invest in an alternative project if the aid measures were not provided. Likewise, the Commission considers it credible that the counterfactual to the proposed investment is no alternative investment, therefore the funding gap has been determined exclusively on the basis of the factual scenario.

(208) It therefore needs to be assessed whether the underlying assumptions of the PALLAS funding gap model submitted by the Dutch Authorities are appropriate in view of the nature, scope and risks of the project.

Revenues

(209) The Commission notes that, as described in recitals (112) to (114), following a transition period of two years, production from the PALLAS reactor and NHC is expected to start from 2033. For the period 2033 to 2070, the estimation of revenues is modelled based on key assumptions regarding total market demand and market shares. The Commission considers the relevant evidence specific to the beneficiary to be a reasonable justification for the period 2033 to 2070. In order to assess the estimation of the market price, the Commission took consideration of historical prices and annual increases currently charged by the HFR reactor to its main customers, Curium and IRE. Additionally, the Commission notes that the revenue evolution in the business plan in line with industry expectations, which account for the differing growth rates between the different isotopes markets (e.g., Mo-99 (unprocessed), therapeutic). Therefore, despite inherent market uncertainty, the Commission considers the estimated market prices and revenues to be reasonable.

(210) Based on the above elements, the Commission considers the modelled revenues in the funding gap analysis to be reasonable.

Costs

(211) As to the costs, the Dutch Authorities explained that the financial model includes all costs relating to the operations of the PALLAS reactor and NHC. As described in recital (116), costs include all regular operational expenses (including

personnel, fuel costs, maintenance, overhead etc.), depreciation, financing (interest) costs, as well as provisions, among others. The Commission considers the estimated cost evolution to be reasonable and in line with inflation.

(212) The investment budget amounts to EUR [2-3] billion (in nominal prices) which the Commission considers as an appropriate estimate. As regards investment costs, PALLAS uses a linear depreciation model in line with the accounting practice of the company and the useful life of the assets, which is estimated to be 40 years. The Commission considers this linear depreciation model to be credible as it is the method used by the company and the useful life of the project's assets is in line with the technical lifespan of similar reactors.

Weighted Average Cost of Capital

(213) To compute the funding gap, an appropriate discount rate has to be used to discount the future cash flows. The Dutch Authorities used the WACC as discount rate. The WACC is the weighted average of cost of debt ('Kd') and cost of equity ('Ke') for a company. The weights used are the proportion of Equity ('E') and of Debt ('D') in the capital structure of the company (E+D). The tax rate is denoted by 't'. The WACC is computed as follows:

WACC=Kd*D/(E+D)(1-t)+Ke*E/(E+D).

(214) The estimates for the cost of debt and cost of equity are obtained on the basis of standard approaches according to the following formulas:

Kd = risk-free rate + risk premium on debt, and

Ke = risk-free rate + levered beta * risk premium on equity + project specific risk premia.

(215) The Dutch Authorities have estimated the WACC a typical investor would require for a project with comparable risk characteristics. The figures used for the cost of debt, cost of equity and unlevered beta were updated to the latest information available. On this basis, the Dutch Authorities submit that the WACC in a baseline scenario amounts to [10-20]%.

(216) As regards the cost of debt, the Dutch Authorities have applied a base rate based on the 1-month EURIBOR estimated at 3.579% by Bloomberg, as per 15 June 2024. The Commission considers that the risk rate methodology used by the Dutch Authorities is reasonable. At the same time, it does not fully take into account the long useful life and duration of the project. Hence, the Commission has performed a sensitivity scenario which applies the risk-free rate estimated at [1-5]% based on the 30-year Dutch Government bond rate, as described in recital (224).

(217) In addition, the Dutch Authorities apply an interest margin of [400-800] bps, which corresponds to a […] rating with […] level of security or a […]rating with […] level of security on the basis of the Communication from the Commission on the revision of the method for setting the reference and discount rates (2008/C

14/02) [162]. The Commission therefore considers the estimates of the interest margin reasonable in light of the duration of the project and the investment and operational risks involved ([163]).

(218) As regards the cost of equity, and as described in recital (108), the debt-to-equity ratio of [30-70]% has been determined based on the level of debt that the business case of PALLAS can reasonably bear (given the applicable contractual interest rates). The tax rate of 25.80% corresponds to the corporate tax rate applicable to the Netherlands.

(219) The Commission also considers that the market risk premium set at [1-10]% is reasonable and in line with estimates from well-established sources in financial analysis such as Professor Damodaran and Fernandez et al. ([164]).

(220) The Dutch Authorities have determined an unlevered beta of [0.5-2.5] using data for large, listed companies collected from Capital IQ. The Commission notes that the comparable companies are active mainly in the construction business. In light of the relatively high construction risk of the project the Commission considers that such a benchmarking group is relevant. At the same time, the Commission also notes that the nuclear nature of the project may be associated with some risks, which could justify an increase in the project's riskiness and thus the inclusion of a project-specific risk premium in the cost of equity.

(221) The additional project risk premium has been estimated by the Dutch Authorities at [1-10]%, based upon a size premium of [1-5]% and an additional risk premium of [1-5]% for specific risks related to nuclear construction projects. The size premium was estimated by the Dutch Authorities based upon Kroll's Center for Research in Security Prices Decile Size Study ([165]), and is justified based on specific characteristics of the project, such as its reliance on a single asset (i.e. the PALLAS reactor), its concentration of revenue sources in only two markets (diagnostic isotopes and therapeutic isotopes) and its operation with a limited number of key clients, particularly in the Mo-99 business. The additional risk premium is also justified with reference to the significant uncertainties in the project, for example uncertainties related to offtake in the therapeutic isotopes market.

(222) The Commission considers that, although the level of additional risk premium is subject to uncertainty due to lack of comparable data, it still appears to be high compared to construction projects of similar size and investment budget. In addition, based on market reports and external sources ([166]), the Commission notes that equity returns for nuclear power plants range from 7% to 15%.

([162]) OJ C 14, 19.1.2008, p. 6-9.

([163]) In addition to the typical operational risks, the Commission notes that the company is also subject to competition distortion measures which may limit its commercial ability to set prices.

([164]) See Damodaran On-line Home Page (nyu.edu) and Fernandez, Pablo and Garcia de la Garza, Diego and Fernández Acín, Javier, Survey: Market Risk Premium and Risk-Free Rate used for 80 countries in 2023 (April 3, 2023).

([165]) Kroll, 2023.

([166]) KPMG - Nuclear energy market consultation (2021), TNO (2018), National Audit office (2017), and Imperial College London (2013).

However, these projects mostly relate to time periods with lower risk-free rates, which could justify the lower equity returns. Additionally, these projects often have in-build mechanisms to reduce the level of riskiness (e.g. on the revenues side). ([167]) Hence the Commission considers justifiable to introduce an additional risk premium of around [1-5]% to capture all the project specific risks (i.e. instead of the [1-10]% cumulative premia estimated by the Dutch Authorities for the size premium and the additional risk premium).

(223) Overall, the Commission considers that the components of the WACC as outlined in the above recitals and as submitted by the Dutch Authorities are reasonable in view of the size, the risks, the timing, and the type of activity of the project. At the same time, the Commission has also analysed a scenario it views as a more likely baseline scenario, with an adjusted WACC, as shown in the table below, that reflect assumptions that the Commission considers as more reasonable in light of the observations made above, notably regarding the risk-free rate and additional risk premia.

WACC assumptions	**EC Base case WACC**
Unlevered beta	[0.5-2.5]
E/(D+E)	[40-80]%
D/(D+E)	[20-60%]%
Levered beta	[0-2]
Risk-free rate	[1-5]%
Market risk premium	[1-10]%
Additional risk premium	[1-5]%
CoE	**[10-20]%**
Risk-free rate	[1-5]%
Risk premium on debt	[1-10]%
CoD (after tax)	**[1-10]%**
WACC	**[10-20]%**

(224) Moreover, the Dutch Authorities have also provided a sensitivity analysis in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium of [1-5]%. Results from the sensitivity are shown in recital (234).

Aid element

(225) In order to assess the aid element, the gross grant equivalent of the aid is calculated, and it includes the aid resulting from the State loans and the capital injections.

(226) Concerning the Senior Debt, as described in recital (128)(b), the Dutch Authorities determined the gross grant equivalent on the Senior Debt based on the NPV of the difference in interest charges between Q3 2024 and the full

([167]) The Pallas project instead, is subject to some constraints on the commercial behaviour in light of the Commitments set out in the Trustee Mandate and the present Decision.

redemption of the government loans (end of 2049) applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs that result based on the interest rates from the Draft Credit Agreement. The interest costs in both scenarios are based on the outstanding debt balance resulting from the business case.

(227) Concerning the already granted loans not covered by the 2013 Decision (referred to as Old debt), as described in recital (128)(c), the Dutch Authorities have used the same approach as for the Senior Debt and considered the NPV of the difference in interest charges when applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs included in the business case for the PALLAS project, multiplied by the outstanding debt balance resulting from the business case.

(228) The Commission considers it appropriate that, in this case, the aid element corresponds to the difference between the actual interest included in the business case and the scenario where the assumed market parameters are applied. Without aid, PALLAS is expected to pay the market cost of debt. In turn, taking the difference between the two rates captures the overall advantage from the State loans.

(229) For both the Senior debt and the Old Debt, the Dutch Authorities discounted the difference in interest costs using a WACC of [10-20]%, according to their approach as described in recital (128)(b). The Commission has also considered a sensitivity analysis where the cost of debt is used as the discount rate for this calculation ([168]).

(230) Moreover, for both the Senior debt and the Old Debt, the Dutch Authorities assessed the pre-tax difference between the actual returns included in the business case and the scenario where the assumed market returns are applied. However, the Commission believes it is more appropriate to consider the post-tax difference between the actual and the market returns. The Commission has conducted an additional simulation to determine the NPV of the post-tax difference between the actual returns and the assumed market returns. The results of this simulation, summarised in Table 4, confirm that the aid is proportionate.

Table 4: Commission baseline scenario for the proportionality analysis

NPV gap analysis	
WACC assumptions	**EC Base case WACC**
Cost of Equity	[10-20]%
E/(D+E)	[40-80]%
Cost of Debt (after tax)	[1-10]%
D/(D+E)	[20-60]%
WACC	**[10-20]%**
EURk	

([168]) The Commission has conducted a sensitivity analysis based on the scenario it views as a more likely baseline scenario, as described in recital (212). Results from the sensitivity analysis confirm that the aid is proportionate.

Aid element - Equity	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**
funding gap	[1 000 000-2 000 000]
NPV gap	[50 000-400 000]

(231) Concerning the capital injections, as described in recital (128)(a), the Dutch Authorities determined the gross grant equivalent on equity considering the NPV of all equity cash flows (i.e. disbursements to NewCo and dividends paid by NewCo), discounting by the Cost of Equity (of [10-30]%) ([169]).

(232) The Commission has conducted a series of sensitivity analyses ([170]), as outlined in the above recitals, which, lead to results that are close to those provided by the Dutch Authorities, as shown in Table 5 under the column "Base case WACC". Results from this analysis show that the aid element is lower than the funding gap.

(233) In addition, as described in recital (130), the Dutch Authorities have provided a sensitivity analysis in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium of [1-5]% (WACC excl. ARP column). It results from the WACC sensitivity that the aid can be found proportionate also under such a scenario, as shown in Table 5.

Table 5: Summary of the proportionality analysis, with sensitivity on the WACC

NPV gap analysis

WACC assumptions	**WACC excl. ARP**	**Base case WACC**
Cost of Equity	[10-20]%	[10-20]%
E/(D+E)	[40-80]%	[40-80]%
Cost of Debt (after tax)	[1-10]%	[1-10]%
D/(D+E)	[20-60]%	[20-60]%
WACC	[10-20]%	[10-20]%

([169]) The Commission conducted an additional simulation to determine the aid element from capital injections by considering the NPV of the equity disbursement, excluding dividend payments. Results from the simulation confirm that the aid can be found proportionate under all considered scenarios. For clarity purposes, it must be pointed out that the Commission's proportionality assessment includes all disbursements from the Dutch Government to the PALLAS Foundation that were not covered by the 2013 Decision, i.e. including those made in the period 2019-2024 for a total of EUR 425.7 million (40 million in 2019, 46 million in 2020, 30 million in 2021, 60 million in 2022, 148.7 million in 2023, 59 million in March 2024 and 42 million in June 2024) as well as the possible further disbursement of EUR 44 million (which, as explained in recital 27 of the present Decision, the Dutch Government could grant to the PALLAS Foundation before the incorporation of NewCo, thereby leading to a total amount of the loans granted to the PALLAS Foundation equalling EUR 469.7 million).

([170]) The Commission has also conducted a sensitivity analysis using a WACC of 16%, which aligns with the complainant's submission based on a study by Oxera estimating the overall return required by a hypothetical private investor to finance the PALLAS project. Results from the analysis confirm that the aid remains proportionate under this scenario.

EURk		
Aid element - Equity	[500 000-800 000]	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**	**[800 000-1 700 000]**
funding gap	([1 000 000-2 000 000])	([1 000 000-2 000 000])
NPV gap	**([50 000-400 000])**	**([50 000-400 000])**

Source: Information provided by the Dutch Authorities in the Notification

(234) Finally, the Commission notes that, in all the scenarios described above, the aid element is lower than the CapEx of EUR [2-3] billion, as described in recital (104). This indicates that the aid provided by the Dutch Authorities has been granted solely in relation to the CapEx.

(235) The Commission therefore considers that it can be concluded that the aid, including both the State aid associated with State loans (Senior Debt and Old Debt) and the capital injections, is proportionate to achieve the intended objective and to avoid any potential risk of overcompensation.

d) Transparency of the aid

(236) As explained above (recital (34)), the Dutch Authorities commit to publish on the website State Aid Transparency Public Search (europa.eu) the following information: the full text of the individual aid granting decision and its implementing provisions, or a link to it; the identity of the granting authorities; the identity of the individual beneficiary, the aid instrument and amount of aid granted to the beneficiary; the objective of the aid, the date of granting, the type of undertaking (for example SME, large company); the Commission's aid measure reference number; the region where the beneficiary is located (at NUTS level 2) and the principal economic sector of the beneficiary (at NACE group level).

(237) Based on the foregoing, the Commission concludes that the aid in favour of the PALLAS project will be granted in a transparent way.

6.4.2.3.2. Identifying the outstanding distortions of trading conditions which cannot be avoided (despite the aid being necessary, appropriate, proportionate)

(238) By definition, any aid measure distorts competition and trade, even if the measure effectively facilitates the development of a certain economic activity and even if it is necessary, appropriate and proportionate. In particular, aid measures that support the development of the economic activity of a given beneficiary are likely to undermine other operators of the same economic activity and operators of substitutable economic activities.

(239) Despite their being necessary, appropriate and proportionate (as shown in recitals (185) to (235)), the aid measures in favour of the PALLAS project could have a negative impact on other producers of medical isotopes. Given the at least EU-wide (and, in fact, even global) character of the market for medical isotopes, such a negative impact could affect, not only operators established in the Netherlands,

such as for example the company SHINE Europe B.V. (see recitals (55) to (59)), but also operators established in other EU and EEA countries.

(240) However, the impact of the aid in favour of the PALLAS project on competition and trade will be reduced by some mitigating factors, as shown in the following recitals.

(241) Firstly, given the importance of the HFR (which serves approximately 30% of the world market and 70% of the European market: recital (39)) and given the capacity limitations of the other existing or planned research reactors (recitals (39) to (41); recital (54)), it cannot be expected that the latter will be able to fill the supply gap if the HFR is not replaced by the PALLAS reactor. Further, the history of the project has shown that purely private investment into the construction of any other research reactor is currently highly unlikely (recitals (46) to (48)). Therefore, the State aid in favour of the PALLAS project is not likely to have any inappropriate crowding-out effect vis-à-vis other reactor projects.

(242) Secondly, as regards a potential crowding-out effect vis-à-vis alternative technologies, the Commission observes that, given the expected increase in world demand for medical isotopes (recitals (36) and (37)) and given the foreseen closure of many of the existing research reactors (recital (40)), the construction of the PALLAS reactor (as replacement for the HFR) is unlikely to lead to a situation where there would be no room for innovative projects in a market, such as the medical isotopes one, where purchasers need the presence of multiple producers. The following should in fact be considered: (i) it is uncertain whether and to what extent it will be possible to prolong the operation of some of the existing multipurpose research reactors that are foreseen to be closed; (ii) in the medical isotopes industry, it is important to maintain a production capacity exceeding demand (outage reserve capacity) so as to cope with both planned and unexpected production breaks (recitals (40) and (41)); (iii) due to their short decay times and to the strict rules for their transportation, at least certain medical isotopes (especially Mo-99 and Tc-99m) cannot be stockpiled and must be produced continuously (recital (37)) so as to be able to reach the patients on time. The above considerations corroborate the view that purchasers of medical isotopes need the presence of multiple producers in the market. This is the reason why the NucAdvisor study recommends diversified investments in Europe including a combination of at least one new reactor, such as PALLAS, and of innovative projects, such as SHINE. In this regard, the Commission notes that, according to the available information, the SHINE project has been supported by both the Dutch Authorities (see point 5) in recital (131)) and the US Authorities (recitals (60), (86) and (132)).Finally, as regards the complainant's statement (recital (60)) that the demise of the SMART project was mainly due to the State aid in favour of PALLAS, the Commission observes that the available information ([171]) suggests that, while plans for new research reactors, including PALLAS, have probably been taken into account in deciding that demise, there

([171]) ASML's medical-isotope brainchild doesn't make it to the finish line – Bits&Chips (bits-chips.nl) and Escalating complexity thwarts industrialization of non-nuclear radioisotope production – Bits&Chips (bits-chips.nl).

were indeed intrinsic technical difficulties hindering the industrial scale-up of the SMART project.

(243) Thirdly, according to a 2022 report made for the Dutch Government by KPMG (see point 2) in recital (131)), the market shares of NewCo, the operator of the PALLAS reactor, in the worldwide markets for diagnostic and therapeutic isotopes will be roughly the same as the current market shares of NRG, the operator of the existing HFR.

(244) Fourthly, as explained by the Dutch Government (see point 4) in recital (131)), NewCo will allocate costs in such a way as to avoid any cross-subsidisation between its R&D&I activities and the production of medical isotopes. Furthermore, in case of effective collaboration with undertakings, NewCo will comply with section 2.2.2. of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration. These measures will further diminish potential distortions of competition and trade caused by the aid in favour of the PALLAS project. In addition, as explained in recitals (152) and (153), part of the research activities carried out by NewCo will be of a non-economic nature.

(245) Finally, as pointed out by the Dutch Authorities (see point 3) in recital (131)), any distortions of competition and trade caused by the aid in favour of the PALLAS project will be lessened by the fact that NewCo will repay the public funding, and will charge prices for its medical isotopes that reflect the full production costs. Further, the prices charged by NewCo will include a reasonable profit margin. NewCo will thus implement an FCR model, in line with the objectives of the OECD-NEA and of the European Observatory on the Supply of Medical Radioisotopes, thereby contributing to making the medical isotope sector economically sustainable.

(246) Concerning the implementation by NewCo of the FCR principle (mentioned in recital (245)), the Commission takes note that the Dutch Authorities foresee that this shall be monitored by an independent Trustee who shall act on behalf of the Commission in compliance with the Mandate submitted to the Commission by the Dutch Government, which is attached to the present Decision (recital (133)). The Trustee Mandate foresees in particular a "Full Cost Coverage Commitment" and a "No Lowest Price Leader Commitment" to be complied with by NewCo and to be monitored by the Trustee. Pursuant to the Mandate, the monitoring and reporting by the Trustee will enable the Dutch State to demonstrate to the Commission that the Commitments under the Mandate are properly implemented and enforced, so as to confirm in particular that NewCo – when executing the PALLAS programme – behaves in a commercially appropriate manner and does not implement predatory pricing strategies through e.g. cross-subsidisation across commercialised isotopes because of its public funding.

(247) As regards specifically the "Full Cost Coverage Commitment", also referred to as "FCC", foreseen by the Trustee Mandate, the Commission considers that it is in line with the spirit of the FCR principle developed by the OECD-NEA. In particular, the "Full Cost Coverage Commitment" proposed by the Dutch

Authorities takes due account of the OECD-NEA Guidance Document proposing an FCR methodology ([172]), which (on page 8) contains the following indications: "*It is not mandatory that a reactor operator applies this methodology exactly as described in this document. The methodology provides consistent guidance to all reactors, but some reactor operators may already be using their own full-cost identification and recovery methodology. If they can demonstrate that their methodology is compliant with the full-cost recovery principles established and described in this guidance document, such that all relevant costs are identified and recovered, that will be sufficient. [...] Operators have the responsibility to adhere to the principle of full-cost recovery and to ensure it is implemented, respecting applicable domestic accounting law and competition rules. It should be recognised that there may be differences in how such analyses are performed to align with accounting standards and financial reporting. However, this guidance document is for a different purpose and should not be seen as incompatible with those other reports; they all have specific objectives and therefore do not need to be perfectly consistent*". Indeed, the Commission considers that the "Full Cost Coverage Commitment", as proposed by the Dutch Authorities and monitored by the Trustee, ensures that "*all relevant costs are identified and recovered*", as required by the OECD-NEA Guidance Document ([173]).

Assessment of the complainant's allegations about the actual implementation by NewCo of the FCR principle

(248) As regards the actual implementation by NewCo of the FCR principle, the complainant expresses several doubts, which are discussed in the recitals here below.

(249) The complainant states (see point 1) in recital (61)) that, despite the KPMG's 2021 market consultation and an Oxera study indicating that market rates for financing a project like PALLAS are in the range "above 12% to 18.2%" interest per annum (on a nominal basis), the Dutch Authorities' loans to the PALLAS Foundation bear a significantly lower interest rate, i.e. 1.5%. The complainant further states (see point 2) in recital (61)) that, by providing subsidised financing, the Dutch Government lowers the level of return that PALLAS needs generate to remunerate its capital, thus decreasing NewCo's LCUM ([174]) and allowing the

([172]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012.

([173]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the lifetime of the PALLAS programme).

([174]) The so-called 'levelised unit cost' (LCUM) measures the average net present cost of a unit of Mo-99 (i.e. a 6-day Ci) for a reactor, over its lifetime.

company to set a lower price to comply with the FCR principle, compared to a competitor that faces a higher cost of capital.

(250) Concerning the complainant's allegations summarised in recital (249), the Commission observes that, if the Dutch Authorities expected a market return for their investment, then there would be no State aid. This is why the present intervention is under the assessment of the Commission under the EU State aid rules. The Commission notes that, while the loans disbursed by the Dutch Government to the PALLAS Foundation in the period 2019-2024 carried a 1.5% interest rate, as described in recital (28) and highlighted by the complainant, the loans to be disbursed from 2024 onwards will bear a higher interest rate, as described in recital (31)1)c). This adjustment results in rates closer to the market rate, although still below, as these loans continue to constitute State aid. In addition, the Commission has conducted its own assessment of the market return that a typical investor would require for a project with comparable risk characteristics, as described in recitals (215) to (223). The Commission has verified the proportionality of the aid under these assumptions. Moreover, as described in recital (232), the Commission has conducted a sensitivity analysis based on the market return suggested by the complainant and has confirmed that proportionality is met under this scenario as well. Furthermore, the Commission considers that the Commitments proposed by the Dutch Authorities in the Trustee Mandate provide a reasonable reassurance that NewCo has no incentive to price below its full costs and that any deviation can be effectively remedied. The design of the Full Cost Coverage Commitment aims to ensure that, over every financial year, NewCo as a corporation (i.e. not at product level) will cover all costs associated with the PALLAS programme, including a reasonable return to the Dutch State. Moreover, the commitment to Full Cost Coverage aligns with the business plan to ensure that NewCo will not price below its full costs, while also ensuring that it is close to breaking even in its initial years of operation and continues to make profits while operating the PALLAS reactor.

(251) The complainant additionally argues (see point 3) in recital (61)) that a genuine FCR pricing should cover certain cost items.

(252) Concerning the complainant's allegation summarised in recital (251), the Commission observes that, as explained by the Dutch Government (see point b) in recital (132)), the business case for the PALLAS project foresees a far-reaching FCR model, or FCC ([175]), whereby the prices charged by NewCo for the PALLAS products and services will reflect in particular the following costs: preparation phase ahead of the construction of the reactor, licensing, regulatory changes, insurances and taxes, location and ground costs, all regular operational

([175]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the life time of the PALLAS programme).

expenses (personnel, fuel, maintenance, overhead, utilities, etc.), refurbishments, financing, depreciation, security, radioactive waste management, decommissioning. This is a far-reaching FCR model in that it covers costs that are often not reflected in the prices charged by other reactors for their medical isotopes ([176]), meaning that the prices for the PALLAS isotopes will likely be higher than average market prices. In any case, a comparison of the above-listed costs (covered by the PALLAS FCR model) with the cost items mentioned by the complainant as necessary elements of a genuine FCR pricing shows that the latter are covered by the PALLAS FCR model. Indeed, the FCC proposed by the Dutch Authorities in the Trustee Mandate foresees the effective coverage over every financial year, by NewCo as a corporation (i.e. not at product level), of all the following costs:

A. All the costs typically associated with the production, marketing and commercialisation of the PALLAS products, whether directly or indirectly (via depreciation and amortisation of capitalised amounts) expensed into the corporate profit and loss statement of the company. All provisions, but in particular those for the costs associated with the future decommissioning of the PALLAS reactor, should also be included.

B. All the costs that were incurred prior to the Commercial Operating Date and that are directly related to the PALLAS programme. In that context, such costs will need to be taken into account in the full cost coverage verification to be performed by the Trustee through an adjustment (e.g. an allocation/depreciation of those costs over the useful life of the PALLAS reactor or any other relevant process) to the periodic corporate profit and loss statement established by the company.

C. All the costs related to the financing of the construction and operation of the PALLAS reactor and related commercial activities, such as the interest charges (whether expensed or accrued) on the debt capital provided to NewCo and an amount corresponding to either i) the dividends paid by NewCo to the providers of the equity capital or, in case of no dividend payment, ii) a reasonable remuneration of such equity capital.

(253) Moreover, the complainant considers (see the last sentence of point 3) in recital (61)) that a genuine FCR pricing by PALLAS should ensure the allocation of costs to the irradiation of specific medical isotopes: the percentage of costs to be charged to medical isotope customers should take into account the fraction of thermal neutrons needed for the irradiation of those products in relation to the total number of thermal neutrons used for other products and services.

(254) Concerning the complainant's allegation summarised in recital (253), the Commission observes that, as explained by the Dutch Government (see point c) in recital (132)), there is still no international consensus on how to allocate costs to

([176]) An example of this is decommissioning. Depending on the country where the reactor is located, the responsibility for decommissioning costs is subject to different national regimes, ranging from full responsibility of the government to full responsibility of the reactor operator. As mentioned above, according to the FCR model adopted for the PALLAS project, decommissioning costs will be borne by NewCo and reflected in the prices of the products and services provided by PALLAS. Another such example is the costs for the radioactive waste management.

individual products and services, as it is difficult to develop a consistent and auditable model for such a cost allocation: the majority of the cost components are not driven by the specific products and services, and do not scale with the volume of these products and services, but they are common costs of the infrastructure relating to e.g. fuel, cooling, staff, financing, decommissioning, etc. Many countries participating in the OECD-NEA HLG-MR have therefore confirmed that such common costs of the infrastructure – if at all reflected in the prices – are typically allocated on the base of the turnover related to the products and services, and not on the base of the amount or volume of the products and services. This means that the common market practice consists in implementing FCR at the company level, not at the level of individual products and services. In addition, allocating costs to specific irradiation positions is made problematic by the variety of the possible utilisation scenarios over time, the difficulty in counting neutrons and the interference between various positions within the core of the reactor. This is why the FCR model designed by the Dutch Government for the PALLAS project, i.e. the FCC ([177]), follows the abovementioned market practice, whereby FCR is implemented at the company level, not at the level of individual products and services.

(255) Finally, the complainant states (see point 4) in recital (61)) that the Dutch Authorities might want to pursue public policy objectives rather than operate PALLAS in compliance with the FCR principle, especially if it turns out that market prices for medical isotopes are lower than PALLAS's FCR-compliant prices.

(256) Concerning the complainant's allegation summarised in recital (255), the Commission observes that, under Dutch law, a State-owned business such as NewCo is required to charge at least the integral cost for its goods and services (see point e) in recital (132). This law is enforced by the ACM which is an independent authority empowered to investigate any violation thereof and, in case of violation, is empowered to impose fines until the State-owned business ensures compliance. In addition, the Commission observes that the Dutch Government will appoint a Trustee, which shall be tasked with monitoring the implementation by NewCo of the FCR principle as of the commercial operating date of the PALLAS reactor (see point f) in recital (132)). The Commission therefore considers that there are sufficient guarantees that NewCo will implement the FCR principle.

(257) Based on the assessment in recitals (241) to (255), the Commission concludes that the aid in favour of the PALLAS project will only have limited effects on competition and trade.

([177]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the life time of the PALLAS programme).

6.4.2.4. Weighing up the positive effects of the aid with the negative effect on the internal market

(258) As shown in recitals (175) to (184), the aid to the PALLAS project, besides facilitating the development of the production of medical radioisotopes, will have several positive effects for society at large and the Union as a whole.

(259) On the other hand, as shown in recitals (240) to (257), the aid to the PALLAS project will have limited impacts on competition and trade.

6.4.2.5. Conclusion on the weighing up exercise

(260) Based on the considerations in recitals (258) and (259), the Commission considers that the positive effects of the notified measures outweigh their potential adverse impact on competition and trade.

7. CONCLUSION

The Commission finds that the Netherlands has not observed the standstill obligation laid down in Article 108(3) TFEU and has unlawfully granted part of the notified measures. However, the Commission concludes that the aid, including the part unlawfully granted, is compatible with the internal market pursuant to Article 107(3), point (c), TFEU.

The Commission has accordingly decided not to raise objections to the aid in favour of the PALLAS project, on the grounds that it is compatible with the internal market pursuant to Article 107(3)(c) of the Treaty on the Functioning of the European Union.

If this letter contains confidential information which should not be disclosed to third parties, please inform the Commission within fifteen working days of the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to the disclosure to third parties and to the publication of the full text of the letter in the authentic language on the Internet site: http://ec.europa.eu/competition/elojade/isef/index.cfm.

Your request should be sent electronically to the following address:

European Commission,
Directorate-General Competition
State Aid Greffe
B-1049 Brussels
Stateaidgreffe@ec.europa.eu

Yours faithfully,

For the Commission

Margrethe VESTAGER
Executive Vice-President

CERTIFIED COPY
For the Secretary-General

Martine DEPREZ
Director
Decision-making & Collegiality
EUROPEAN COMMISSION

[...]

MONITORING TRUSTEE MANDATE

BETWEEN:

1. The Dutch State, represented by the Minister of Economic Affairs and Climate Policy (hereafter [***X***]), established at the Bezuidenhoutseweg 73, 2594 AC, The Hague

AND

2. [*Insert name, address, and, as the case may be, company details of the Monitoring Trustee*], (the "Trustee").

The Dutch State and the Trustee are hereafter referred to as the "***Mandate Parties***".

WHEREAS

In [PALLAS SA.103925 and SA.103926] and pursuant to State Aid Decision of [PM] of [PMdate] the Dutch State entered into commitments (the "***Commitments***"), attached hereto as [Annex PM], vis-à-vis the European Commission (the "***Commission***") with a view to achieve compatibility of the capitalization and financing of the PALLAS Programme with the internal market and the functioning of the EEA Agreement in line with article 107, paragraph 3, sub c, of the Treaty on the Functioning of the European Union.

The Commission approved the state aid for NewCo by its decision pursuant to Article 107, paragraph 3, sub c, TFEU (the "***Decision***"), subject to full compliance with the Commitments, which are included in the Decision as a condition for approval and attached to the present Mandate.

According to the Commitments the Dutch State undertakes to establish independent monitoring of the competitive behaviour by NewCo - when executing the PALLAS Programme - on the Union market(s) for medical isotopes by means of the appointment of the Trustee in addition to already existing legal frameworks and the financial covenants with NewCo. The monitoring and reporting of the Trustee will enable the Dutch State to demonstrate to the Commission that the Commitments are properly implemented and enforced through, among others, confirming that NewCo - when executing the PALLAS Programme - behaves in a commercially appropriate manner and does not implement predatory pricing strategies through e.g., cross-subsidization across commercialised isotopes because of its public funding.

The Trustee shall carry out the duties under this Mandate in accordance with a Work-Plan it has submitted during the selection process whereby it was selected as Trustee as well as any revision(s) of that Work-Plan, approved by the Commission.

On this basis, with the express approval of the Commission, the Dutch State undertakes to appoint a Trustee in the period between a year before the Commercial Operating Date of the PALLAS Programme and the Commercial Operating Date of the PALLAS Programme for the monitoring of the compliance of NewCo with the Commitments, included in the Decision and annexed to the present Mandate as Annex 1, which the Dutch State has provided to the Commission to ensure normal competitive and commercial behaviour by NewCo when executing the PALLAS

Programme. In accordance with the Commitments, the Dutch State hereby engages the Trustee and this agreement forms the mandate referred to in the Commitments (the "***Mandate***").

IT HAS BEEN AGREED AS FOLLOWS:

Section A. Definitions

1. Terms used in this Mandate shall have the meaning as set out below:

Commercial Operating Date: the date the PALLAS Programme will be executed and will first produce isotopes which are marketed and sold to commercial clients.

Decision: the Commission's decision pursuant to Article 107, paragraph 3, sub c, TFEU, *SA* [PM] of [PM date] not to object the state aid for the PALLAS-project.

Market segments: any combination of a product and geographic dimension where competition conditions are homogeneous and where NewCo is active when executing the PALLAS Programme. For the purpose of the present Mandate, the following Market segments have been identified:

i. Diagnostic isotopes (unprocessed);
ii. Therapeutic isotopes (unprocessed);
iii. Diagnostic isotopes (processed into radio chemicals or radiopharmaceuticals in the PALLAS facilities);
iv. Therapeutic isotopes (processed into radio chemicals or radiopharmaceuticals in the PALLAS Programme facilities);
v. Industrial isotopes.

An approximation of the geographic dimension will be given for each Market segment in the Trustee reports. This list may change from time to time due to market evolutions and/or changes in NewCo's commercial strategy when executing the PALLAS Programme. The Dutch State shall ensure that NewCo has properly informed the Trustee in case of such a change, at the latest by the time it has become effective.

NewCo: the legal entity whose shares are held by the Dutch State, and which executes the PALLAS Programme.

Normal competitive and commercial behaviour: the behaviour of a normal market economy operator which, in particular, does not implement predatory pricing strategies through e.g., cross-subsidisation across product segments because of its public funding.

PALLAS Programme: the production of isotopes at the PALLAS-reactor, the marketing and sale of those isotopes to commercial clients, the activities of the Nuclear Health Centre.

Trustee Partner Firms: the other firms belonging to the same organisation of individual partnerships and/or companies as the Trustee.

Trustee Team: the person or group of persons, all and individual independent from the Dutch State and NewCo or any of its affiliated undertakings, responsible for carrying out the tasks assigned by this Mandate and identified in Section D.

Work-Plan: the outline of the work-plan submitted to the Dutch State prior to the result of the competitive selection procedure and as communicated by the Dutch State to the Commission before the approval of the Trustee and attached hereto as [Annex PM].

Section B. Appointment of the Trustee

2. The Dutch State hereby appoints, in line with the results of the competitive selection procedure, the independent Trustee to monitor compliance with the Commitments regarding the normal competitive and commercial behaviour by NewCo when executing the PALLAS Programme and report to both the Dutch State and the Commission. The Trustee accepts the said appointment in accordance with the terms of this Mandate.

3. The appointment and this Mandate shall become effective on the date of signature by both Mandate Parties hereof.

4. The Trustee Team shall consist of the following key person [keypersons]: [*name and title of each of the key persons (partners/leading persons)*]. The Trustee shall not replace the members of the Team without prior approval of the Dutch State's Minister of Economic Affairs and Climate Policy and the Commission.

Section C. General Duties and obligations of the Trustee

5. The Trustee shall act on behalf of the Commission to allow the Dutch State to ensure NewCo's compliance with the Commitments and assume the monitoring duties specified in the Commitments. The Trustee shall carry out the duties under this Mandate in accordance with the Commission's Decision and with the Work-Plan as well as revisions of the Work-Plan, approved by the Dutch State and the Commission.

6. The Trustee will, prior to providing any report or recommendation to the Commission or the Dutch State consult NewCo to confirm (the completeness of) the facts and figures used by the Trustee for its report or recommendation.

7. The Trustee shall recommend to the Dutch State such measures as the Trustee considers necessary to ensure NewCo's compliance with the Commitments following prior consultation with the Commission.

8. The Trustee shall provide to the Commission, sending the Dutch State a confidential copy and sending NewCo a non-confidential copy at the same time, a written report within thirty (30) days after the approval by the external auditor of the annual accounts but no later than six (6) months after the end of each financial year in relation to the implementation of and compliance with the Commitments.

9. The Trustee shall promptly report in writing to the Commission and to the Dutch State, if it concludes on reasonable grounds that NewCo is failing to comply with any feature of the Commitments.

10. The Commission may, on its own initiative or on the basis of a report of the Trustee order the Dutch State to undertake measures to ensure compliance with the Commitments. The Trustee shall only receive instructions from the Commission.

11. If the Trustee, based on his monitoring activities, considers that the Commitments are not properly implemented and/or complied with, the Trustee may recommend the execution of one or more of the Remedies identified in the present Mandate (the "***Remedies***") to the Commission

and the Dutch State. In the event that the Commission approves the recommendation of the Trustee, or any variation thereof, following possible consultation with the Trustee, the Dutch State will be responsible for the implementation of the relevant Remedies under the supervision of the Commission. The Trustee shall monitor the execution of the Remedies and report on this in accordance with paragraph 18.

Section D. Duties and obligations of the Monitoring Trustee

D.1. Monitoring the Commitments

12. The Trustee oversees the competitive and pricing behaviour of NewCo in conformity with the Commitments. To that end, the Trustee shall in particular:

(a) Monitor and verify, at the end of every financial year:

(i) financial forecasts used for audit purposes (for impairment testing of the facilities);

(ii) the effective coverage over every financial year, by NewCo as a corporation[1], of all of the costs associated with the PALLAS Programme by the revenues generated from the commercialisation of the various isotopes into the various market segments where NewCo is active (the "***Full Cost Coverage Commitment***"). In that context, costs must be understood as:

- All costs typically associated with the production, marketing, and commercialisation of the PALLAS Programme's products whether directly or indirectly (via depreciation and amortisation of capitalized amounts) expensed into the corporate profit and loss statement of the company. All provisions, but in particular those for the costs associated with the future decommissioning of the PALLAS-reactor, should also be included;
- all costs that were incurred prior to the Commercial Operating Date and that are directly related to the PALLAS Programme. In that context, such costs will need to be taken into account in the full cost coverage verification to be performed by the Trustee through an adjustment (e.g., such as an allocation/depreciation of those costs over the useful life of the PALLAS-reactor or any other relevant process) to the periodic corporate profit and loss statement established by the company;
- all costs related to the financing of the construction and operation of the PALLAS-reactor and related commercial activities such as the interest charges (whether expensed or accrued) on the debt capital provided to NewCo and an amount corresponding either to i) the dividends paid by NewCo to the providers of the equity capital or, in case of no dividend payment, ii) a reasonable remuneration of such equity capital;

(iii) that the following process will be followed in order to provide the relevant information to the Trustee in order to comply with the Full Cost Coverage Commitment:

- The complete set of Audited and Certified Financial Statements of NewCo, audited and certified by the auditors appointed by NewCo's Board of Directors ("the Financial Statements of NewCo") will be provided to the Trustee within 5 working days. In case, due to unforeseen circumstances, an Audited and Certified Financial statement is not available, Newco will provide the financial statements to the Trustee no later than six months after each financial year. The

[1] That is, not at product level.

Audited and Certified Financial Statements of NewCo will be drawn up in compliance with Dutch GAAP or IFRS.

- Necessary adjustments in respect of the monitoring of the Full Cost Coverage Commitment ("the annual adjustments") will be made and included in a Full Cost Coverage Statement in order to account for the inclusion of the annual portion of the (full) costs incurred prior to the actual commencement of the commercial operation of the PALLAS Programme i.e., in the years 2019 to 2032 (i.e., non capitalised portion of the 'CAPEX' related to the PALLAS Programme, operational expenditures (if any) and non-capitalised interest charges) which will be provided to the Trustee. The Full Cost Coverage Statement will be audited and certified by NewCo's auditors and provided to the Trustee ultimately within 30 days after the provision of the Financial Statements of NewCo. The Trustee shall agree with the auditors appointed by NewCo's Board of Directors and agree upon procedures with respect to the audit of the elements of the Full Cost Coverage Statement.
- A pre-agreed detailed list of the relevant cost natures (based, among others but not exclusively on the Financial Model provided by the Dutch authorities to the Commission) will be included in the annual adjustments.
- The cost of equity will be included in the above-mentioned list of costs and to reflect, on an annual basis, a reasonable and adequate return for the Dutch State's equity investment in NewCo. The cost of equity will be based on the benchmark provided by the Dutch State when acting as an equity investor in State-owned companies, the "target return" (in Dutch: normrendement) as included in the Policy for State-owned enterprises).[2]
- The complete set of Audited and Certified Financial Statements of NewCo as well as the Full Cost Coverage Statement as audited and certified by the auditors appointed by NewCo's Board of Directors will be provided to the Trustee for the purposes of the verification of NewCo's compliance with the Full Cost Coverage Commitment as included in the Commission's Decision and will be the result of the combination of the Financial Statements of NewCo with the annual adjustments (both as described above).

(iv) the internal pricing policies applied by NewCo when executing the PALLAS Programme for the different isotopes produced by NewCo, where possible accompanied by a comparison with the pricing policies applied by other irradiators (in Europe and relevant third countries); and

(v) if the marketing, pricing and investment policies of NewCo are based on market principles, where possible accompanied by a comparison with the marketing, pricing and investment policies applied by other irradiators (in Europe and relevant third countries).

(b) In the event the monitoring and verification as described above is insufficient to ensure compliance with the Full Cost Coverage Commitment the Trustee may verify at the same time as and in the context of the above:

[2] It is understood and agreed upon as permissible between the European Commission and the Dutch State that by applying this point, a technical breach will most likely occur in the early years following COD of the PALLAS-reactor (probably first 2 years of operations) regarding Full Cost Coverage with regard to the cost of equity due to the long term nature of this project and required ramp-up post COD, among others. Historical unachieved returns do not lead to adjustments in the annual target return.

(i) the contents of the contracts of NewCo with the largest clients or a representative sample of contracts;
(ii) the process through which NewCo closes a contract;
(iii) the commercial terms of a contract, and;
(iv) based on the above, more specifically, request from NewCo, every financial year, a comparison of the evolution of the effective average prices NewCo will have charged its customers, over the last financial year, on each of the Market segments where NewCo is active, with the evolution of the average market price observed over that same period on each of the Market segments mentioned, to the extent this information is publicly available and/or can be sourced by the Trustee with or without the help of NewCo and/or advisors at the reasonable expense of NewCo, with the view to verify whether NewCo is generally not acting as a price leader on the Market segments (the "***No Lowest Price Leader Commitment***").

(c) Report to the Commission, with a confidential copy of the reports to the Dutch State, on the compliance of NewCo with the Commitments.

D.2. Imposing Remedies and Monitoring their Execution

13. If the Trustee, based on his monitoring activities, considers that, over a period of minimum 12 months, the Commitments are not properly implemented and/or complied with, the Trustee may recommend to the Commission and the Dutch State, the execution of one or more of the following Remedies:

(a) In the case the Trustee concludes that the net profit level (following the process described in point 12 (a) (iii)) of NewCo is in breach of the proper implementation of the ***Full Cost Coverage Commitment*** at company level for a full financial year or for a period of at least 12 months (consecutive or not, even if they overlap 2 financial years), the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedy and notifying it to the Commission for a new approval:

the interest paid by NewCo on its loans from the Dutch State will be increased by a punitive interest, in addition to the existing and agreed upon interest rate, to be proposed by the Trustee for the period during which NewCo will be considered to be in breach of the Full Cost Coverage Commitment with regard to one or more loans provided by the Dutch State in such a way as to increase the need of NewCo for sufficient revenue. The punitive interest rate will increase the costs for NewCo at least to the amount NewCo should have additionally calculated to its clients in line with the ***Full Cost Coverage Commitment,*** on top of the revenue amounts actually charged to those customers.

(b) In the case the Trustee concludes that NewCo is in breach of the proper implementation of the ***No Lowest Price Leader Commitment*** for a period of at least 6 months over the last 12-month period (consecutive or not, even if they overlap 2 financial years) on any of the various Market segments, the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedies and notifying it to the Commission for a new approval:

(i) […]

(ii) […]

[…].

14. In the event that the Commission approves, in writing, the recommendation of the Trustee, or any variation thereof, following possible consultation with the Trustee, the Dutch State and/or NewCo, the Dutch State shall:

    a. In case of a recommendation pursuant to paragraph 13, subparagraph a, apply article 6 of the Dutch State Aid Recovery Act and;
    b. in case of a recommendation pursuant to paragraph 13, subparagraph b, under i), […]; and
    c. in case of a recommendation pursuant to paragraph 13, subparagraph b, under ii) […].

15. In consultation with the Commission and the Dutch State, the Trustee may consider that NewCo is in compliance with the ***No Lowest Price Leader Commitment*** even if it were failing to meet the test of that Commitment if and only if NewCo can justify its failure to meet the Commitment over any relevant period as a result of (i) properly justified non-predatory volume-based rebates claimed by customers over the period, (ii) force majeure such as a sanitary/supply crisis, or (iii) a supply shortage due to the lack of capacity to meet the required demand on one or more of the various Market segments where NewCo is active, or (iv) any other particular reason(s) cleared by Trustee (ideally in advance of commercialisation). The applicability of any and all of the above exceptions are always subject to the review and formal approval (or rejection) of the Commission.

D.3. Rights of the Trustee in Performing the Mandate

16. When performing the above duties, the Trustee shall have the following rights vis-à-vis NewCo, its officers and personnel:

(a) The management board of NewCo shall keep the Trustee informed as to the implementation of, and compliance with, the obligations deriving from the Commitments, in particular regarding the ***Full Cost Coverage*** as well as the ***No Lowest Price Leader Commitment***;

(b) Every year, the Trustee shall receive a periodic report on the implementation of, and compliance with, the obligations deriving from the Commitments, in particular regarding ***Full Cost Coverage Commitment*** as well as the N***o Lowest Price Leader Commitment*** from the management board;

(c) The Trustee shall have the right to request to attend (when considered necessary), which will not be unduly withheld and speak at all meetings of the Audit Committee and the Supervisory Board;

(d) The Trustee shall not have the right to vote nor the right to be counted in the quorum. The Trustee shall however be entitled to propose items on the agenda of the meetings held by the Audit Committee and/or Supervisory Board in relation with its task and duties;

(e) The Trustee shall receive copies of the relevant documentation of the Audit Committee and the Supervisory Board in the same manner and at the same time as the members of the Audit Committee and the Supervisory Board. Aside from these communications, the Trustee will receive all other information deemed relevant by the Management Board;

(f) The Trustee shall have the right to meet with the Management Board in advance of all meetings of the Audit Committee and the Supervisory Board in order to prepare for such meeting and receive any information necessary for the performance of its task and duties;

(g) In respect of the other committees of the Supervisory Board, the Trustee may request to attend meetings of these committees, to the extent relevant in carrying out its duties.

Section E. Reporting obligations

17. After thirty (30) days of the approval by the external auditor of the annual accounts but no later than six (6) months after the end of each financial year or as otherwise agreed with the Commission, the Trustee shall submit a written report to the Commission (the "***Report***"), sending to the Dutch State a confidential copy at the same time as well as a non-confidential version to NewCo.

18. The Report shall cover the Trustee's fulfilment of its obligations under the Mandate and the compliance of Dutch State with the Commitments and, more particularly, all the topics listed under paragraph 12 above with the view to assess and conclude on the effective compliance by NewCo to the Commitments entered into by the Dutch State.

    The Report may contain recommendations about how the implementation of the topics listed under paragraph 12 above may be improved and, as a result, how compliance with the Commitments may become more effective.

19. When applicable, a confidential version of the Report will be presented to the Dutch State before the Annual General Meeting of the Company where the annual accounts are approved and adopted as well as the discharge of the executive board members is decided.

20. A confidential version of the Report of the Trustee will be provided to the Dutch State's Parliament and may therefore become public. A non-confidential version of the Report may become public.

21. If the Trustee considers that an intermediate report is needed because of a significant breach of the NewCo's compliance with the Commitments, the Trustee may issue such a report or some advice to the Commission with a confidential version to the Dutch State.

Section F. Duties and obligations of the Dutch State and NewCo

22. The Dutch State shall provide and shall cause NewCo to provide the Trustee with all such cooperation, assistance and information as the Trustee may reasonably require to perform its tasks. This includes, but is not limited to, the powers and rights listed in Section D, paragraph 12.

23. NewCo shall provide and – as the case may be the Dutch State – the Trustee with all managerial and administrative support that it may reasonably request.

24. The Dutch State and its officials shall in conformity with legal obligations laid down in Dutch law not divulge any and all commercially sensitive information received from the Trustee – including the confidential report – to NewCo and/or its employees nor make that information public unless ordered to do so by a court decision.

Section G. Trustee related provisions

G.1. Conflict of Interests

25. The Trustee, the Trustee Team and the Trustee Agent Partner Firms shall disclose current relationships with NewCo and Affiliated Undertakings in [Annex PM]. On this basis, the Trustee confirms that, as of the date of this Mandate, the Trustee and each member of the Trustee Agent Team is independent of NewCo and Affiliated Undertakings as well as of the Dutch State and has no Conflict of Interest.

26. The Trustee undertakes not to create a Conflict of Interests during the term of the Mandate. The Trustee, the members of the Trustee Team and Trustee Partner Firms may therefore not during the term of this Mandate:

    a. have or accept any employment by or be or accept any appointment as Member of the Board or member of other management bodies of NewCo or Affiliated Undertakings other than appointments pertaining to the establishment and performance of the Mandate;

    b. have or accept any assignments or other business relationships with or financial interests in NewCo or Affiliated Undertakings that might lead to a Conflict of Interests;

    c. have or accept any other appointments, assignments or other business relationships that may, in view of the circumstances of the particular case, be regarded as impairing the Trustee's objectivity and independence in discharging its duties under the Mandate.

27. Should the Trustee, the Trustee Partner Firms or members of the Trustee Team wish to undertake an assignment, business relationship or investment that may reasonably give rise to a Conflict of Interests, such a person shall seek the prior approval of the Commission and the Dutch State. Should the Trustee become aware of a Conflict of Interests, the Trustee shall promptly inform the Commission and the Dutch State of such Conflict of Interests. In the event that the Dutch State becomes aware that the Trustee or the Trustee Partner Firms have or may have a Conflict of Interests, the Dutch State shall promptly notify the Commission and the Trustee of such Conflict of Interests. Where a Conflict of Interests occurs during the term of the Mandate, the Trustee undertakes to resolve it immediately. Where the Conflict of Interests cannot be resolved or is not resolved by the Trustee in a timely manner, the Mandate may be terminated in accordance with paragraph 36 below.

28. The Trustee, the Trustee Partner Firms or members of the Trustee Team shall be prohibited from communicating any information relating to this Mandate to any other of the Trustee's personnel, except for information of a general nature (e.g. Trustee's appointment, fees accounting, etc.), and except for information whose disclosure is required by law.

G.2. Remuneration

29. [PM will be inserted after the selection procedure]

30. The Trustee shall be remunerated by the Dutch State in such a way that it does not impede its independence and effectiveness in fulfilling the Mandate.

G.3. Indemnity

31. The Dutch State shall indemnify the Trustee and the members of the Trustee's Team and hold each Indemnified Party harmless against liabilities resulting from the fulfillment of the Mandate, except to the extent that such liabilities result from the willful default, recklessness, gross negligence or bad faith of the Trustee and the members of the Trustee's Team.

G.4. Confidentiality

32. The Trustee and the members of the Trustee Team shall treat and protect all information and communication received from NewCo and the Dutch State as confidential information.

33. The Dutch State will be entitled to disclose any confidential information it receives in relation to, or for the purposes of, this Mandate to the European Commission, General Accounting Office or the States-General in accordance with the obligations laid down in the Dutch Constitution and relevant legislation.

Section H. Termination of the Mandate

34. This Mandate may only be terminated under the conditions set out in paragraphs 35-37.

H.1. Regular Termination of the Mandate

35. This Mandate shall terminate automatically if the Dutch State is no longer either a shareholder or a creditor of NewCo.

H.2. Termination of the Mandate before the Discharge

36. The Dutch State may only terminate the Mandate before the discharge of the Trustee in case of a Conflict of Interests that could not resolved in a timely fashion. The termination shall be subject to the approval of the Commission.

37. The Trustee may only terminate the Mandate for good cause, by giving written notice to the Dutch State and the Commission. The Trustee shall continue to carry out its duties under this Mandate until it has effected a full handover of all relevant information to a new Trustee approved by the Commission on the proposal of the Dutch State pursuant to the competitive procedure laid down in the Commitments.

H.3. Surviving Provisions

38. Paragraphs 31 – 33 shall survive the termination of the Mandate.

Section I. Additional Provisions

I.1. Amendments to the Mandate

39. This Mandate may only be amended in writing. The Mandate Parties agree to amend this Mandate if required by the Commission, after consultation with the Mandate Parties, in order to secure compliance with the Commitments, in particular if the amendment is necessary in order to adapt this Mandate to amendments of the Commitments.

I.2. Governing Law and Dispute Resolution

40. This Mandate shall be governed by and construed in accordance with Dutch civil law.

41. In the event that a dispute arises concerning the Mandate Parties' obligations under this Mandate, such dispute shall be submitted to the non-exclusive jurisdiction of the District Court of The Hague.

I.3. Notices

42. All notices sent under this Mandate shall be made in writing and be deemed to have been duly given if served by personal delivery upon the party for whom it is intended or delivered by registered or certified mail, with request of return receipt, or if sent by fax, upon receipt of oral confirmation that such transmission has been received, to the person at the address set forth below :

    If to the Minister of Economic Affairs and Climate Policy, addressed as follows: [·] If

    to the Minister of Health, addressed as follows:

    [·]

    If to the Trustee, addressed as follows:

    [·]

    If to the Commission, addressed as follows:

Or to any such other address or person as the relevant party may from time to time advise by notice in writing given pursuant to this section. The date of receipt of any such notice, request, consent, agreement or approval shall be deemed to be the date of delivery thereof.

[*Indicate place and date*] By:
Title:

By:
Title:

Annex [·]

Disclosure of current relationships between the Trustee, the Trustee Team and the Trustee Partner Firms and NewCo and Affiliated Undertakings.

Annex [·]

Annex [·]

EUROPEAN COMMISSION

Brussels 26.7.2024
C(2024) 5503 final

In the published version of this decision, some information has been omitted, pursuant to articles 30 and 31 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus […]		PUBLIC VERSION This document is made available for information purposes only.

Subject: **State Aid SA.103925 (former SA.103925 (2022/PN) and SA.103926 (2022/PN)) – The Netherlands – PALLAS project: Aid for the construction of a research reactor and of an isotope processing facility in Petten**

Excellency,

1. PROCEDURE

(1) On 26 June 2024, following pre-notification discussions initiated in April 2022, the Dutch Authorities officially notified to the European Commission a set of measures in support of the PALLAS project.

(2) By letter of 26 June 2024, submitted with the notification, the Netherlands exceptionally agreed to waive its right deriving from Article 342 TFEU, in conjunction with Article 3 of Regulation No 1/1958 ([1]), to have the decision adopted and notified in Dutch, and accepted to have this Decision adopted and notified in English.

([1]) Regulation No 1 determining the languages to be used by the European Economic Community, OJ 17, 6.10.1958, p. 385.

Mr. Caspar Veldkamp
Minister of Foreign Affairs
Rijnstraat 8, 2500 EB The Hague
The Netherlands

2. FACTS

2.1. The PALLAS project as part of the PALLAS programme

(3) The PALLAS programme aims to guarantee the long-term security of supply of medical radioisotopes ([2]) in the Netherlands, Europe and the world. To this end, the PALLAS programme comprises three initiatives: 1) the replacement of the existing High Flux Reactor by a new reactor (the future PALLAS reactor), 2) the construction of the Nuclear Health Centre, and 3) innovation in the already existing FIELD-LAB.

(4) The measures notified by the Netherlands on 26 June 2024 are aimed at supporting only the first two out of the three initiatives included in the PALLAS programme. In the present Decision, the Commission refers to the first two initiatives of the PALLAS programme as "the PALLAS project". The PALLAS project therefore consists in the construction of the PALLAS reactor and of the Nuclear Health Centre ("NHC"). Both the PALLAS reactor and the Nuclear Health Centre will be built and operated by a newly incorporated company, provisionally called "NewCo".

(5) The PALLAS reactor will replace the existing High Flux Reactor (HFR) ([3]), which is one of the world leaders in the production of medical isotopes, has been in operation since 1961 and is planned to stop operating when the PALLAS reactor takes over production (expected at the beginning of the 2030s). The PALLAS reactor will be built in the same site where the current HFR is located, namely the Energy & Health Campus in Petten.

(6) The HFR and the future PALLAS reactor are both categorised as "research reactors", with a different purpose and size compared to "nuclear power plants". Nuclear power plants are large installations that generate 500 to 4 000 Mega Watt (MW) of heat, driving turbines for electricity production. By contrast, research reactors are much smaller and are designed to generate a flux of neutrons for various (research) applications. Most research reactors are low power university reactors (1-5 MW) used for education and a myriad of fundamental neutron scattering or activation research activities. The HFR and the future PALLAS reactor, however, operate in a different segment and are among a dozen research reactors with power levels (10-100 MW) high enough for a sufficient neutron flux to produce isotopes in large quantities, and to conduct fuel and materials research for nuclear power technology. The PALLAS reactor will have a power level of 25 MW, while the HFR operates at 45 MW.

([2]) A radioisotope (or radioactive isotope), also known as a radionuclide (or radioactive nuclide), is any of several species of the same chemical element with different masses, whose nuclei are unstable and dissipate excess energy by spontaneously emitting radiation in the form of alpha, beta, and gamma rays. Radioisotopes or radionuclides are also referred to more simply as isotopes or nuclides.

([3]) The HFR is managed by the Institute for Energy and Transport of the Joint Research Centre (JRC) of the European Commission and is operated by the Nuclear Research and consultancy Group (NRG). More particularly: the JRC, as owner of the HFR (for a lease of 99 years), is the plant and budget manager; the NRG operates and maintains the reactor, under contract, for the JRC, and, since 2000, manages the commercial activities of the reactor.

(7) As explained by the Dutch Authorities, the HFR and the future PALLAS reactor are highly versatile in their utilisation and have a relatively high number of full power days. Their flexible core designs allow for simultaneous irradiation of multiple isotopes, with the possibility of online loading at any point during the operating cycle, and various types of experiments. The PALLAS reactor will be outfitted with flexible provisions in the core, vessel and beryllium reflector, providing possible adaptability for future applications to satisfy market needs.

(8) Just like the HFR, the PALLAS reactor will be used for the production of medical and industrial isotopes, as well as for research and other services ([4]) (multipurpose reactor). However, compared to the HFR, the PALLAS reactor will have a stronger focus on the production of medical isotopes.

(9) As regards medical isotopes, the PALLAS reactor will be used to produce isotopes for both diagnostic and therapeutic purposes, including Molybdenum-99 (Mo-99), which is the most important diagnostic isotope, and Lutetium-177 (Lu-177), which is one of the most promising therapeutic isotopes. Therapeutic isotopes are expected to be the most important revenue driver for NewCo, generating on average circa [30-40]% of the company's revenues in the period 2033-2035.

(10) As already mentioned, besides the construction of the new reactor, the PALLAS project includes the construction, in the same Petten campus, of a NHC, which will be an isotope processing facility expected to start operations in 2031. In fact, the production of nuclear medicines by using a reactor (such as the HFR and the future PALLAS reactor) comprises three main steps, as follows:

a) In the first step ("irradiation"), suitable materials, so-called "targets", are irradiated in the reactor. This results in the creation of radioactive isotopes in the target.

b) In the second step ("processing"), chemical processes are carried out to separate (or extract) a given isotope from the irradiated target. This results in the separated isotope being made available as a radiochemical.

c) In the third step ("labelling"), the radiochemical containing the separated isotope is further processed in order to link the isotope to an appropriate ligand. This third step results in a radiopharmaceutical that can be administered to patients.

The NHC will be used to carry out the processing step described under b). The NHC will be a generic (non-specific) facility (matching the generic PALLAS reactor), whose technical specifications allow the processing of a variety of isotopes that are known or expected to have medical applications.

(11) More precisely, in the PALLAS project the targets irradiated in the PALLAS reactor will be processed as follows:

([4]) These are services related among others to target sourcing, container management, the dismantling of radioactively contaminated installations and the management of (historic) radioactive waste.

- As regards diagnostic isotopes (such as Mo-99), the targets irradiated in the PALLAS reactor will be processed in the already existing Molybdenum Processing Facility (MPF), which is located in Petten and is currently used to extract diagnostic isotopes from targets irradiated in the HFR. It must be observed that the MPF currently processes not only targets irradiated in the HFR, but also targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland. The same will happen when the HFR is replaced by the PALLAS reactor: the MPF will process not only targets irradiated in the PALLAS reactor, but also targets irradiated in other reactors. In addition, just like the current HFR, the PALLAS reactor will supply irradiated targets for the production of diagnostic radiochemicals not only to the MPF, but also to other processing facilities (such as IRE in Belgium ([5])).

- As regards therapeutic isotopes (such as Lu-177), the targets irradiated in the PALLAS reactor will be processed in the yet to be built NHC ([6]). The NHC will process not only targets irradiated in the PALLAS reactor, but also targets irradiated in other reactors. In addition, the PALLAS reactor will supply irradiated targets for the production of therapeutic radiochemicals not only to the NHC, but also to other processing facilities.

The reason why it is necessary to have multiple processing facilities is that, for each combination of a given irradiated target and a corresponding medical isotope (e.g. a Uranium target and Mo-99, or an Ytterbium target and Lu-177), a specific chemical process needs to be designed and engineered in a dedicated facility, requiring significant investments. This means that, for example, the existing MPF can only be used to process irradiated Uranium targets through a chemical process resulting in purified Mo-99. It is not possible – without considerable efforts in engineering, construction and licensing – to use a Mo-99 production line to process a chemically different target to extract another medical isotope. In practice, processing lines are dedicated facilities for a specific chemical process to extract a specific medical isotope from an irradiated target of a specific chemical composition. As a non-specific facility, the NHC will have several generic hot cells, which can be used to set up different processing lines. In this way the NHC can process a variety of isotopes that are known or expected to have medical applications.

(12) The information in recitals (10) and (11) shows that, as regards both diagnostic isotopes (such as Mo-99) and therapeutic isotopes (such as Lu-177), the PALLAS project covers the irradiation step resulting in the creation of radioisotopes (as described in recital (10), point a)) and the processing step resulting in the production of radiochemicals (as described in recital (10), point b)). However, the PALLAS project does not cover the final labelling step (as described in recital

([5]) The Institut National des Radioéléments (IRE) in Fleurus, Belgium, operates a Mo-99 processing facility. The IRE facility and the MPF are the two large-volume Mo-99 processing facilities in Europe.

([6]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

(10), point c)) whereby radiochemicals are made into radiopharmaceuticals that can be administered to patients ([7]).

(13) In addition to being used for the irradiation and processing of medical isotopes, the PALLAS reactor and the NHC will be used to carry out research in the fields of nuclear medicine and nuclear energy, as well as to provide services related among others to target sourcing, container management, the dismantling of radioactively contaminated installations and the management of (historic) radioactive waste.

(14) The PALLAS project has undergone several environmental impact assessments within the procedures for the issuance of both the conventional and the nuclear permits ([8]). Those assessments, independently reviewed by the Commissie voor de Milieueffectrapportage (Netherlands Commission for Environmental Assessment), have concluded that the environmental impacts of the PALLAS project can be contained by implementing appropriate mitigation measures, in particular in relation to two NATURA 2000 sites in the vicinity of the project. Based on the above conclusion of the environmental impact assessments, several permits have been issued for the PALLAS project between 2018 and 2023, including in particular the following: the Municipal Zoning Amendment licence (2018-2020), the Nature Protection Act licence (2019-2022), the Construction licence (2020-2023), the Water Act licence (2021-2023) and the Nuclear Energy Act licence (2018-2023). The recommendations of the Commissie voor de Milieueffectrapportage are taken into account during the execution of the PALLAS project.

2.2. The State aid decision adopted by the Commission in 2013

(15) The PALLAS project was already supported by State aid approved by the European Commission in July 2013 ([9]) ("the 2013 Decision").

(16) According to the information available at the time of adoption of the 2013 Decision ([10]), the implementation of the PALLAS project was divided into several phases:

Phase 0 - Preparation, business case (2009-2012),

Phase 1 - Design, tendering, permitting, financing/business case (2013-2017),

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([7]) As explained by the Dutch Authorities, PALLAS will not be an active player in the field of labelling. In fact, while the NHC will be able to provide the infrastructure for the labelling step (resulting in radiopharmaceuticals that can be administered to patients), this will only happen on a small scale for the purpose of R&D&I activities (for instance, the production of small batches that can be used for clinical trials). In the long term, it can be that pharmaceutical companies will rent the NHC labelling infrastructure or ask PALLAS to do the labelling on their behalf based on an intellectual property licence.

([8]) The PALLAS environmental assessments are documented on the website of the Commissie voor de Milieueffectrapportage (Netherlands Commission for Environmental Assessment) Zoeken - Commissiemer.nl. The Commissie voor de Milieueffectrapportage is the body responsible under Dutch law to independently review the environmental impact assessment of projects.

([9]) Commission decision C(2013) 4414 final of 17.7.2013 in case SA.36653 (2013/N) PALLAS - Aid for a new research reactor in Petten (Netherlands), Official Journal 10.9.2013 (C/261/2013).

([10]) See recital 4 of the 2013 Decision.

Phase 2 - Construction (2017-2022),

Phase 3 - Operation (2023 - at least 2063).

(17) As explained in recitals 6 to 11 of the 2013 Decision:

- PALLAS was originally an initiative of the Nuclear Research and consultancy Group (NRG), the operator of the HFR and a subsidiary of the Energy Research Centre of the Netherlands (ECN) ([11]). PALLAS was supposed to be a private initiative to be realised under market conditions. ECN-NRG attempted to find private financing for the project via a public tender for the development and construction of the reactor. However, they did not succeed in attracting sufficient private financing.

- Following that unsuccessful attempt to find private financing, in 2012 the Dutch Government commissioned an independent economic consultant, Booz & co., to review the business case for PALLAS. That review confirmed that the construction of a new nuclear reactor is too risky for private investors: in particular, the outcome of the permitting process could be that the eventual nuclear regulations (such as specific safety requirements) are such that the construction of the reactor would not be commercially viable. In addition, due to specific historical reasons, the current prices of radioisotopes do not cover the full costs of their production, thereby making the commercial viability of a new radioisotopes reactor even more uncertain. The future situation on the medical radioisotopes market will depend on the results of EU and OECD ([12]) initiatives which aim at finding a commercially sustainable economic model for the sector.

(18) As shown in recitals 12 to 17 of the 2013 Decision, given the public interest of PALLAS, the Dutch Government decided to support the project with public funding to cover the total expected expenditure in Phase 1. The public funding would be provided to the beneficiary in the form of two loans under identical conditions: one from the central government (EUR 40 million) and one from the regional government of Noord-Holland (EUR 40 million). The public investment would be paid back before or during the operation of the reactor, together with an interest. The beneficiary of the aid would be a newly created non-profit Foundation. The objective of the Foundation would be to define the design of the reactor, to execute the tendering and licensing processes and to attract private financing for Phase 2 (construction) and Phase 3 (operation). Once private investors would step in for Phases 2 and 3, the Foundation would be converted into a private enterprise and taken over by the private investors. The Dutch Government would step out of the project by the end of Phase 1.

([11]) The NRG is a general partnership under Dutch law (vennootschap onder firmas) composed of the two Foundations Stichting NRG and Stichting ECN-nucleair. Both Foundations hold, as members of the general partnership, the licence (under the Nuclear Energy Act) to operate the High Flux Reactor. The two Foundations are not controlled by the Dutch State or any other public body (there are no government officials sitting on the boards and supervisory boards of the two Foundations). Under article 3 of its Articles of Association, the NRG pursues the following activities: the provision of safe and reliable isotope production to fulfil societal needs; the provision of high quality independent nuclear research and innovation; the provision of services to companies working with nuclear technology; the provision of services for the decommissioning and management of radioactive contaminated installations and waste.

([12]) Organisation for Economic Co-operation and Development.

(19) For the reasons presented in recitals 42 to 81 of the 2013 Decision, the Commission concluded that the planned loans in favour of the PALLAS project were State aid compatible with the internal market under Article 107(3)(c) of the Treaty on the Functioning of the European Union (TFEU).

2.3. Description of the notified measures

(20) In December 2013, the Dutch Authorities established the Stichting Voorbereiding PALLAS reactor (Foundation for the preparation of the PALLAS reactor; the "PALLAS Foundation") ([13]). The PALLAS Foundation was tasked to carry out Phase 1 of the project and to find private investors that would step in for Phases 2 and 3. To carry out the above tasks, in 2014 the PALLAS Foundation received the two loans, amounting to a total of EUR 80 million, approved by the Commission in the 2013 Decision. These loans bear a 1.5% interest rate and should be reimbursed by 31 December 2025.

(21) The PALLAS Foundation's attempts to find private investors that would step in for Phases 2 and 3 have been unsuccessful. In fact, it has turned out that private investors would accept to take the investment risks, only provided that the Dutch Authorities issue far-reaching guarantees. However, if the Dutch Authorities issued such far-reaching guarantees, this would lead to a situation where private parties would have control of the company (into which the PALLAS Foundation would be converted at the end of Phase 1), while substantial risks would remain with the public authorities. In 2020, the conclusion was reached that this would be an unacceptable situation and position for the Dutch Government ([14]). As a result, the latter has made a new plan, under which public funds will be granted to implement, not only Phase 1 of the project, but also Phase 2, i.e. to build the PALLAS reactor and the NHC (the "new plan").

(22) In the meantime, implementation delays have resulted in Phase 1 (design, tendering, licensing) ([15]) being still ongoing at the time of notification. According to the new timeline provided by the Dutch Authorities, Phase 2 (construction) is now planned to start in the second half of 2024, while Phase 3 (operation) should begin in 2031-2033.

(23) Since 2020, and in view of the implementation of the new plan, NRG and the PALLAS Foundation have been collaborating as a single virtual company under the name of NRG|PALLAS, with the intention to merge and form a new company: NewCo. NewCo will be a public limited liability company, whose shares will be (fully) held by the Dutch Authorities. The Dutch Authorities have

([13]) The PALLAS Foundation is not controlled by the Dutch State or any other public body (there are no government officials sitting on the board and supervisory board of the Foundation). Under article 2 of its Articles of Association, the PALLAS Foundation pursues the following activities: the design and construction of a reactor for the production of medical and industrial radioisotopes and for nuclear research in the municipality of Schagen (the PALLAS reactor); the operation of the PALLAS reactor.

([14]) Kamerstukken II 2020/21, 33626, nr. 13.

([15]) More precisely, Phase 1 includes the following: procurement of the general contractor, detailed design of the PALLAS reactor and of the NHC, detailed design and preparation for the construction of the foundation pit, detailed design of the access roads, nuclear and environmental permits, further development of the business case.

explained that the formation and financing of NewCo will only take place after a positive outcome of the State aid assessment by the Commission.

(24) In the years 2019-2024, the Dutch Authorities granted to the PALLAS Foundation further loans (in addition to the EUR 80 million loan approved by the Commission in 2013) that are not covered by the 2013 Decision and that were not notified to the Commission prior to their being granted (the "already granted loans not covered by the 2013 Decision").

(25) By their letter of 26 June 2024, the Dutch Authorities notified both A) the already granted loans not covered by the 2013 Decision and B) the funding of NewCo.

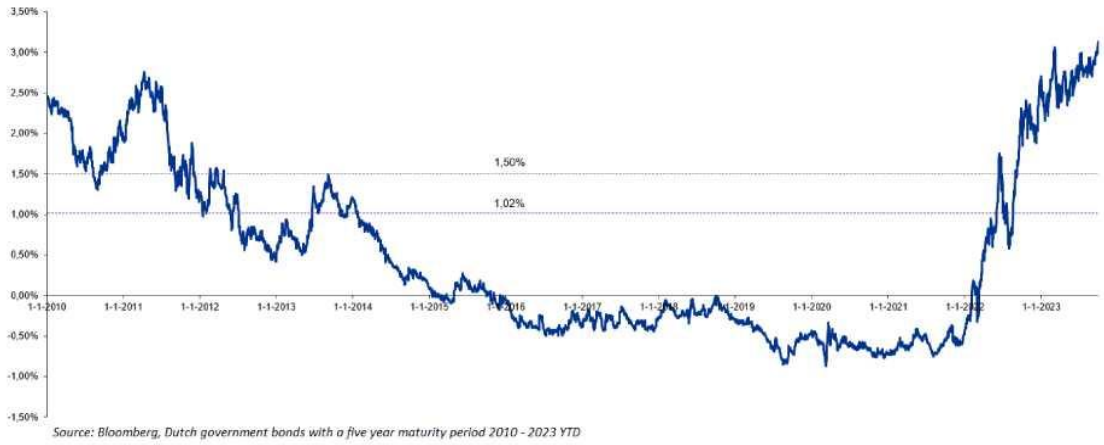
A) The already granted loans not covered by the 2013 Decision

(26) According to the information submitted by the Dutch Authorities, the loans granted by the Dutch Government to the PALLAS Foundation ([16]) in the period 2019-2024 amount to a total of EUR 425.7 million, as follows: 40 million in 2019, 46 million in 2020, 30 million in 2021, 60 million in 2022, 148.7 million in 2023, 59 million in March 2024 and 42 million in June 2024.

(27) In addition, it is expected that, in the remainder of 2024 and until the incorporation of NewCo, the Dutch Government could grant to the PALLAS Foundation a further financing of EUR 44 million, which would result in the total amount of the loans granted to the PALLAS Foundation equalling EUR 469.7 million.

(28) All these loans, like the loans approved by the 2013 Decision, bear a 1.5% interest rate and should be reimbursed by 31 December 2025. As explained by the Dutch Authorities, this rate was set at 1.5% based on the government lending rate of 1.02% plus a mark-up of 0.48% at the time of the 2013 Decision. This concerns the yield on Dutch Government bonds with a five-year maturity, in line with the initial duration of the 2013 loans granted by the Ministry of Economic Affairs and the Region of Noord-Holland. The graph below shows that the yield was well below 1.02% between 2014 and mid-2022, while since the second half of 2022 the yield has increased in line with the overall uplift in interest rate observed in the market.

([16]) It should be noted that the loans have been provided to the PALLAS Foundation, as NRG|PALLAS is not a legal entity but the name of the single virtual company under which NRG and the PALLAS Foundation have been working together through a personnel union since 2020.



Source: Bloomberg, Dutch government bonds with a five year maturity period 2010 - 2023 YTD

(29) As already mentioned, all these loans were granted in addition to the EUR 80 million loan approved by the 2013 Decision, are not covered by that Decision and were not notified to the Commission prior to their being granted.

(30) The Dutch Authorities explained that these additional loans have been granted to complete Phase 1. In fact, the completion of Phase 1 has taken longer than initially foreseen, both because of implementation hurdles ([17]) and because the unavailability of private investors has led to changes compared to the 2013 plan, which has resulted in the need to cover the operational costs of the PALLAS Foundation until the Dutch Government definitively decides to set up NewCo and implement the new plan, under which public funds will be granted to implement, not only Phase 1 (design, tendering and licensing of the project), but also Phase 2 (construction of the project).

B) The funding of NewCo

(31) According to the Dutch Authorities, the public funding of NewCo will comprise the following:

1) Circa EUR [1 400-2 000] million, consisting of a combination of equity ([40-80]%) and long-term debt ([20-60]%) as follows:

a) Circa EUR [30-60] million of unconditional equity to capitalise NewCo at incorporation. This amount of unconditional equity is necessary to ensure NewCo has a sufficient level of working capital, also taking account of minimum liquidity levels required by law. The Dutch Authorities pointed out that the exact amount will be determined on the basis of the actual opening balance sheet of NewCo and of the then applicable budget for the following year.

b) EUR [800-1 100] million of conditional equity specifically and exclusively earmarked for the PALLAS project, i.e. to build the PALLAS

([17]) As explained by the Dutch Authorities, Phase 1 has proved to be more complex than expected. For example, the need to mitigate the project's impact on nature protection areas (NATURA 2000), the Dutch nuclear safety requirements, the procurement procedures and the risk aversion of the construction companies have all contributed to Phase 1 taking longer than initially planned.

reactor and the NHC. This conditional equity will be provided in quarterly tranches.

c) EUR [400-800] million of long-term debt specifically and exclusively earmarked for the PALLAS project. This long-term debt will be provided in quarterly tranches. During the construction period of the PALLAS reactor, a higher interest rate (based on the Commission Communication 2008/C 14/02 ([18])) will apply assuming an interest margin of [200-600] bps above EURIBOR ([19]) during construction. Two years after the PALLAS reactor has become operational ("operating date of the PALLAS reactor"), the interest rate will be lowered, to reflect the decreased risk profile of NewCo. This lowered interest rate (which will also be based on the Commission Communication 2008/C 14/02) will not be lower than [50-200] bps (assuming a credit rating of [AAA-CCC] and a […] level of security/collateral). Interest will be accrued until two years after the operating date of the PALLAS reactor, from which point quarterly interest payments are assumed. Repayment of the principal plus accrued interest will happen linearly in 30 years, starting from two years after the operating date of the PALLAS reactor, which is currently envisaged in 2031-2033. This means that full repayment will be completed around 2063. However, the Dutch Government will impose the following obligations: i) NewCo shall allocate all excess cash flows to debt repayment ("cash sweep mechanism") and ii) NewCo shall not distribute any dividends before the debt, including accrued interest, is fully repaid. Given obligations i) and ii), the Dutch Government expects that the debt will be fully repaid around 2049.

2) A refinancing of all existing loans of the PALLAS Foundation, whose maturity will be extended beyond 31 December 2025 until two years after the operating date of the PALLAS reactor. This refinancing concerns all the loans granted to the PALLAS Foundation until the present day, i.e. both the loans authorised by the 2013 Decision and the already granted loans that are not covered by the 2013 Decision indicated in recitals (26) to (27). The reimbursement of these extended loans will take place under the same conditions as the ones foreseen for the EUR [400-800] million long term debt mentioned above: repayment of the principal plus accrued interest will happen linearly in 30 years, as from two years after the operating date of the PALLAS reactor, which is currently envisaged in 2031-2033, meaning that full repayment will be completed around 2063; however, given the obligations imposed on NewCo (i.e. the cash sweep mechanism and the prohibition to distribute dividends before the debt is fully reimbursed), the Dutch Government expects that the loans will be fully repaid around 2049 ([20]). The

([18]) Communication from the Commission on the revision of the method for setting the reference and discount rates, OJ C 14, 19.1.2008, p. 6-9.

([19]) The Euribor rates are considered to be the most important reference rates in the European money market. Those interest rates provide the basis for the price and interest rates of all kinds of financial products like interest rate swaps, interest rate futures, saving accounts and mortgages. The 5 EURIBOR rates have not fluctuated much recently despite their different maturities (e.g., EURIBOR-1 week stood at 3.597 % and the EURIBOR-12 months at 3.503% on 18 July 2024).

([20]) However, as explained by the Dutch Authorities, the EUR 40 million loan granted by the Region of Noord-Holland has been extended with a final maturity date of 1 April 2035.

extended loans will keep the same interest rate they currently have (i.e. 1.5%). The same loan extension and repayment schedule will also apply to any further loans granted to the PALLAS Foundation until NewCo is set up.

(32) The Dutch Government has made it clear that no State aid is planned to support the operation of NewCo once the PALLAS reactor starts commercial production. The PALLAS reactor will start commercial production when, following the completion of the construction works of the reactor and its commissioning, a ramp-up phase of circa two years will have ended during which production is gradually transferred from the HFR to the PALLAS reactor. Therefore, the notified measures aim at financing the construction of the PALLAS reactor and of the NHC, but not their operation.

(33) The legal basis of the notified measures under Dutch law is the Comptabiliteitswet 2016 (Accounts Act 2016). The funds for the loans and the financing of NewCo come from the Dutch Treasury.

(34) As regards the transparency of the aid, the Dutch Authorities commit to publish on the website State Aid Transparency Public Search (europa.eu) the following information: the full text of the individual aid granting decision and its implementing provisions, or a link to it; the identity of the granting authorities; the identity of the individual beneficiary, the aid instrument and amount of aid granted to the beneficiary; the objective of the aid, the date of granting, the type of undertaking (for example SME, large company); the Commission's aid measure reference number; the region where the beneficiary is located (at NUTS level 2) and the principal economic sector of the beneficiary (at NACE group level).

2.4. The market for medical radioisotopes

(35) Radioisotopes are used in medicine to diagnose and treat various diseases, including life-threatening ones like cancer or cardiovascular and brain diseases. Over 10 000 hospitals worldwide use radioisotopes in about 100 different nuclear medicine procedures totalling almost 49 million medical exams each year. In the EU alone, more than 1 500 nuclear medicine centres deliver about 10 million procedures to patients each year ([21]).

(36) The therapeutic use of radioisotopes in cancer therapy is increasingly expanding, with a forecasted massive growth of the market for novel therapeutic radiopharmaceuticals in the 2020s ([22]). Currently, Lutetium-177 (Lu-177) is one of the most promising isotopes for cancer therapy. Lu-177 is mostly produced by irradiating either Lutetium-176 (Lu-176) or Ytterbium-176 (Yb-176) in nuclear research reactors ([23]). The irradiation phase is followed by a processing phase,

([21]) Study on sustainable and resilient supply of medical radioisotopes in the EU (JRC/BRU/2017/A.7/0001/0C).

([22]) Radiotherapeutics, which represented 20% of the global nuclear medicine market in 2021, are expected to reach ~70% by 2031 (MEDraysintell Nuclear Medicine Edition 2022, http://medraysintell.com/).

([23]) The production process based on the irradiation of Lu-176 results in the so-called carrier-added Lu-177, which is mainly used to treat neuroendocrine tumours. On the other hand, the production process

where the irradiated target (either Lu-176 or Yb-176) is subjected to chemical processes to extract the Lu-177, which, after having undergone further chemical processes aimed at linking it to an appropriate ligand, can be delivered to hospitals for the treatment of patients.

(37) However, most of the nuclear medicine procedures today are for diagnosis, with Technetium-99m (Tc-99m) being the most widely used diagnostic isotope (in 80% of all radiodiagnostic procedures). Tc-99m demand is expected to rise worldwide due to ageing populations in Europe and North America and to growing use in emerging economies. Tc-99m is mostly produced by using a process which includes the irradiation of Uranium targets in nuclear research reactors to produce Molybdenum-99 (Mo-99), the extraction of Mo-99 from the targets in specialised processing facilities and the production of Mo-99/Tc-99m generators, which are then shipped to hospitals where patient doses are extracted from the generators ([24]). Due to their short decay times, Mo-99 and Tc-99m cannot be stockpiled and must be produced continuously and delivered to hospitals weekly. Any supply disruption can lead to a situation where crucial diagnostic imaging tests must be cancelled or postponed, with negative and sometimes life-threatening consequences for patients.

(38) Medical isotopes are mainly produced by using either cyclotrons, or nuclear power reactors, or nuclear research reactors. Nuclear research reactors, such as the HFR and its planned replacement PALLAS, are multipurpose installations where both production of medical isotopes and research in nuclear technology are carried out; nuclear power reactors are primarily used for energy production but can allocate some of their capacity to produce medical isotopes ([25]); cyclotrons are particle accelerators used to produce medical isotopes ([26]).

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based on the irradiation of Yb-176 results in non-carrier-added Lu-177, which is mainly used to treat prostate cancer.

([24]) A Mo-99/Tc-99m generator is a device used to extract Tc-99m from a sample of Mo-99. The generator comprises a column packed with alumina, where Mo-99 is adsorbed. As Mo-99 decays, it produces Tc-99m, which is eluted (or "milked") from the generator using a saline solution. The elution of the patient doses from the generator is carried out by the hospitals.

([25]) As explained by the NucAdvisor study published in 2021, "Using power reactors, particularly CANDU reactors, is an interesting way to produce isotopes, but not all the operators are ready to take the risk of perturbing their primary power production in case of potential malfunctions of the isotopes production. In addition, only 2 CANDU reactors exist in Europe, operated by Nuclearelectrica in Romania, which currently does not plan to produce other isotopes than ^{60}Co" (Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com), p. 154).

([26]) Typically, reactor-based medical isotopes are neutron-rich isotopes commonly characterised by a long half-life, while accelerator-based medical isotopes tend to offer a shorter half-life and usually emit positrons or γ rays (Production Review of Accelerator-Based Medical Isotopes - PMC (nih.gov)). Both cyclotrons and reactors are necessary, because some isotopes can only be produced by using cyclotrons (I. Cyclotron-produced Isotopes in Clinical and Experimental Medicine | British Journal of Radiology | Oxford Academic (oup.com)), while some other isotopes can only be produced by using reactors (Technopolis+Group+Medical+isotope+production+using+local+cyclotrons+2022 (1).pdf: "Cyclotrons are primarily suitable to produce PET isotopes and cannot produce various (esp. therapeutic) isotopes that are important from a medical perspective. For this a nuclear reactor remains necessary."; Radioisotopes in Medicine | Nuclear Medicine - World Nuclear Association (world-nuclear.org): " […] the main radioisotopes such as Tc-99m cannot effectively be produced without reactors.** Some Tc-99m is produced in accelerators but it is of lower quality and at higher cost.").

(39) Most medical isotopes are produced by using nuclear research reactors financed by governments. More in particular, a limited number of such reactors currently provide about 95% of the world's Mo-99 production: the HFR in the Netherlands, the BR-2 reactor in Belgium, the SAFARI reactor in South Africa, the OPAL reactor in Australia, the MARIA reactor in Poland and the LVR-15 reactor in the Czech Republic. The EU is the worldwide leading supplier of medical radioisotopes with a market share of more than 60% for the main diagnostic isotope Mo-99 ([27]). The HFR serves approximately 30% of the world market for Mo-99, and approximately 70% of the European market.

(40) Most of the abovementioned reactors are approaching the end of their lifespan. In particular, three of the four European reactors (HFR in the Netherlands, BR-2 in Belgium and LVR-15 in the Czech Republic) are expected to be out of operation by 2040, while the MARIA reactor in Poland should stop operations in 2050 ([28]). As a result, they have an increasing need for planned maintenance cycles and a growing frequency of unplanned production interruptions, which affects the global supply of radioisotopes. This is the case for the HFR in the Netherlands, which commenced operations in 1961 and is planned to close in the early 2030s.

(41) In the medical isotopes industry, it is therefore important to maintain an irradiation capacity that exceeds demand. In fact, the small number and the age of the existing research reactors capable of producing Mo-99 have jeopardised the security of supply of this crucial isotope. In 2008-2010, there were periods of global scarcity of medical radioisotopes due to the fact that several research reactors had to be unexpectedly shut down for maintenance. Further unexpected shutdowns have occurred more recently, although not to the same extent as in 2008-2010. The most recent disruption in the global supply of Mo-99 occurred in November 2022, when the LVR-15 and HFR reactors were undergoing planned maintenance, while the BR-2 reactor experienced a technical failure ([29]). This is why, to assess whether there is sufficient capacity in the industry, the OECD Nuclear Energy Agency (OECD-NEA) includes an outage reserve capacity (ORC) in its demand estimates. This refers to the capacity that is estimated to be needed to cover demand in case unexpected disruptions occur. In its latest reports, the OECD-NEA has recommended a 35% ORC ([30]).

([27]) "European study on medical, industrial and research applications of nuclear and radiation technology" published by the European Commission in 2019 (https://data.europa.eu/doi/10.2833/511137).

([28]) In June 2023, the Polish Government announced that the MARIA reactor will be refurbished so as to prolong its operation until 2050.

([29]) As explained in the October 2023 OECD-NEA report Nuclear Energy Agency (NEA) - The Security of Supply of Medical Radioisotopes: Demand and Capacity Projections for 99Mo/99mTc for the 2023-2027 Period (oecd-nea.org), "In late 2022, a combination of extended planned maintenance and unplanned outages led to significant global shortages of ^{99}Mo and reactor-based therapy isotopes. A single reactor had been scheduled to operate in the European network, but unplanned outages led to an extended period with no irradiation capacity available from the network. No irradiation capacity in Europe directly blocks significant ^{99}Mo processing capacity, leading to global supply shortages".

([30]) See e.g. Nuclear Energy Agency (NEA) - 2019 Medical Isotope Demand and Capacity Projection for the 2019-2024 Period (oecd-nea.org), p. 7, and Nuclear Energy Agency (NEA) - The Security of Supply of Medical Radioisotopes: Demand and Capacity Projections for 99Mo/99mTc for the 2023-2027 Period (oecd-nea.org), p. 14.

(42) In 2012, the European Commission and stakeholders established the European Observatory on the Supply of Medical Radioisotopes, aimed at bringing together all relevant information to the decision makers in the EU institutions and in national governments so as to assist them in defining and implementing relevant policies ([31]). The Observatory is composed of members from the Euratom Supply Agency, the European Commission, the European Association of Nuclear Medicine and various industry stakeholders. The Observatory has four strategic objectives: (i) to support a secure Mo-99/Tc-99m supply across the EU, (ii) to ensure that the Mo-99/Tc-99m supply issue is given high political visibility, (iii) to encourage the creation of a sustainable economic structure of the supply chain by supporting the implementation of the full cost recovery (FCR) methodology developed by the OECD-NEA, and (iv) to establish periodic reviews of the supply chain and capacities.

(43) According to a 2014 report by the European Observatory on the Supply of Medical Radioisotopes ([32]), the existing European network of research reactors is fundamental to ensure the supply of medical radioisotopes, thereby making it necessary to undertake investments to refurbish the current fleet and to replace the capacity that will be lost as the operating reactors reach the end of their lifespan ([33]).

(44) This finding of the Observatory was confirmed by two 2021 reports prepared for the European Commission, namely the NucAdvisor study ([34]) and the Technopolis study ([35]), both of which concluded that, if the EU's aging production capacity is not replaced in time, the EU will become increasingly dependent on countries outside Europe. In particular, the NucAdvisor study concluded that the construction of at least one new research reactor in Europe is needed to minimise EU reliance on foreign supply concerning all necessary isotopes ([36]).

(45) In February 2021, the Commission presented the SAMIRA action plan ([37]), as part of Europe's Beating Cancer Plan ([38]). Under the SAMIRA action plan, the Commission is to establish a European Radioisotope Valley Initiative to maintain

([31]) See Supply of medical radioisotopes - European Commission (europa.eu).

([32]) WG4_Report.pdf (europa.eu).

([33]) This finding of the Observatory was included in the conclusions of a 2015 report by the Euratom Supply Agency (Activities following up the Council Conclusions of 15 December 2009 on the Security of Supply of Radioisotopes for Medical Use and the Council Conclusions of 6 December 2010 and 7 December 2012 'Towards the Secure Supply of Radioisotopes for Medical Use in the European Union' (europa.eu)).

([34]) Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com).

([35]) Study on sustainable and resilient supply of medical radioisotopes in the EU - Therapeutic Radionuclides (technopolis-group. com).

([36]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([37]) Commission Staff Working Document SWD(2021) 14 final on a Strategic Agenda for Medical Ionising Radiation Applications of 5.2.2021 (SAMIRA: Strategic Agenda for Medical Ionising Radiation Applications (europa.eu)).

([38]) Communication from the Commission to the European Parliament and the Council COM(2021) 44 final on Europe's Beating Cancer Plan of 3.2.2021.

Europe's global leadership in the supply of medical radioisotopes and help accelerate the development and introduction of new radioisotopes and production methods.

(46) Research made by the OECD and the EU indicates that, because of the economics of the sector, the supply of medical radioisotopes is characterised by prices for the irradiation of medical radioisotopes that have been and still are too low for private investors to construct new research reactors on a commercial basis ([39]). This is due to the fact that all the existing reactors that are used to produce medical radioisotopes were originally constructed and operated with 100% government funding, mainly for research and materials-testing purposes. When Mo-99 production started, the capital costs of the reactors had been paid or fully amortised for other purposes. Therefore, Mo-99 was seen as a by-product. This resulted in: (a) the reactor operators originally requiring reimbursement of only direct short-run marginal costs, (b) the Mo-99 process not covering any significant share of the costs for overall reactor operations, maintenance, replacement or refurbishment, (c) no substantive price changes even as the importance of Mo-99 production increased among reactor operating activities.

(47) To remedy the economically unsustainable nature of the production of medical radioisotopes, the OECD has issued several policy recommendations ([40]). These OECD (non-binding) recommendations include the implementation of the principle of full cost recovery (FCR) throughout the supply chain, which is also one of the four strategic objectives of the European Observatory described above. In 2014, several countries, including the Netherlands, signed a Joint Declaration committing to implement the FCR principle and the other OECD recommendations ([41]). However, the success of these initiatives will depend on further developments in the OECD discussions about the FCR principle and, for the time being, the market for medical radioisotopes remains economically unsustainable for purely commercial operations. As concerns specifically FCR, the countries members to the OECD-NEA High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) have not yet reached an agreement on the various cost components to be included in FCR models, nor have they reached an agreement on a model for the allocation of costs to individual products and services.

(48) In addition to the prices for medical radioisotopes still being too low, another reason why private investors are unwilling to build new research reactors for the

([39]) See in particular: The Supply of Medical Radioisotopes An Economic Study of the Molybdenum-99 Supply Chain (oecd-nea.org), OECD-NEA 2010; "The Supply of Radioisotopes - The Path to Reliability", OECD-NEA 2011 (http://www.oecd-nea.org/med-radio/reports/med-radio-reliability.pdf); and "The Supply of Medical Isotopes - An Economic Diagnosis and Possible Solutions", OECD-NEA 2019 (https://www.oecd-nea.org/jcms/pl_15144/the-supply-of-medical-radioisotopes).

([40]) See in particular the six policy principles issued by the High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR), which were formally endorsed by the OECD Steering Committee for Nuclear Energy on 28 April 2011 (Nuclear Energy Agency (NEA) - Statement by the OECD/NEA Steering Committee for Nuclear Energy Regarding Policy Actions Necessary to Ensure the Long term Security of Supply of Medical Radioisotopes (oecd-nea.org)).

([41]) NEA press release - Joint Declaration on the Security of Supply of Medical Radioisotopes (oecd-nea.org).

production of medical isotopes is that such projects, like all nuclear projects, involve long-term investment risks ([42]). The market consultation about nuclear power plants published by KPMG in July 2021 ([43]) shows that, although private investors are willing to take some construction risks, they are not willing to take many of the other risks associated with nuclear projects, notably black swan ([44]), regulatory and licence risks. This is confirmed by the unsuccessfulness of the Dutch Authorities' attempts to find private investors willing to build the PALLAS reactor.

(49) While most medical radioisotopes continue to be produced in nuclear research reactors, alternative technologies are emerging. Such innovative projects include the accelerator-driven subcritical reactor SHINE (USA).

(50) However, as indicated by the NucAdvisor and Technopolis studies, such innovative projects, despite promising extrapolations from laboratory experiments or validation of their individual components, still lack experience feedback of their first full scale industrial production. Until such feedback becomes available, it is not possible to assess in a compelling manner whether these novel technologies will be sufficiently competitive with nuclear research reactors (in terms of costs, production yields, reliability, product quality, etc.), thereby offering a valid industrial alternative ([45]). In particular, the SHINE project differs greatly from the current reactors and is based on innovative technologies, combining in an integrated manner nuclear, reprocessing and chemical processes, that still necessitate demonstration at full industrial scale ([46]). Therefore, the Technopolis study concludes that these alternatives "*provide an innovative, but hardly proven option that requires time to scale up to global demand*" ([47]).

(51) In addition, while a nuclear research reactor can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging

([42]) This is also confirmed in the Commission's State aid decision on the nuclear power plant Hinkley Point C, where a long construction and operating time, and hence a long payback period (of more than 30 years), is mentioned [Commission Decision of 08.10.2014 on the aid measure SA.34947 (2013/C) (ex 2013/N) which the United Kingdom is planning to implement for support to the Hinkley Point C Nuclear Power Station, recital 89]. The Commission's decision on Hinkley Point C was confirmed by judgment of the EU Court of Justice (Grand Chamber) of 22 September 2020 in Case C-594/18 P.

([43]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([44]) The term "black swan" refers to extremely rare and unpredictable events with severe consequences, popularised by Nassim Nicholas Taleb in "The Black Swan" (2007). Key traits include rarity, severe impact, and predictability in hindsight. In nuclear projects, black swan risks involve rare, catastrophic events like nuclear accidents (Chernobyl, Fukushima), sudden regulatory changes, and technological failures. Private investors avoid these risks due to potential financial losses, unpredictability, reputational damage, and complex insurance and liability issues, making them extremely difficult to manage and mitigate.

([45]) NucAdvisor 2021, p. 108.

([46]) NucAdvisor 2021, p. 87, p. 98; Technopolis 2021, p. 58.

([47]) Technopolis 2021, p. 63.

technologies ([48]). Therefore, the production scope of emerging technologies is smaller than the production scope of a nuclear research reactor.

(52) Given the above uncertainties about newer technologies and because, for the time being, research reactors are the only kind of installations that can produce a large variety and quantity of isotopes simultaneously ([49]), the NucAdvisor study concluded that, to reduce the risk of supply shortages and to minimise EU dependence on countries outside Europe, investments should be made in Europe in a mix of technologies that would include (in addition to existing production capacity) a combination of at least one new research reactor and of innovative systems such as the US-based SHINE and the Belgian SMART ([50]).

(53) It is against this background that the Dutch Government has decided to launch and to continue the PALLAS project aimed at replacing the HFR by a new nuclear research reactor.

(54) In addition to the PALLAS project supported by the Dutch Government, other European Governments are investing in new research reactors for the production of medical isotopes. The French Jules Horowitz Reactor (JHR), whose construction should be completed ca. 2030, and the Belgian Multi-purpose hYbrid Research Reactor for High-tech Applications (MYRRHA), which is aimed to replace the BR-2 reactor and whose construction should be completed by 2037, will produce medical isotopes. In Germany, the already operational Forschungsreaktor München II (FRM-II) will undergo design modifications to be able to produce Mo-99. However, since these reactors are primarily aimed at research, their capacity to produce medical isotopes on a large scale is limited by the capacity needs of the research activities. This is why the combined capacity of the JHR, MYRRHA and FRM-II reactors will be insufficient to meet European demand for both diagnostic and therapeutic isotopes ([51]).

3. COMPLAINT FROM A COMPETITOR

(55) On 22 December 2022, the Commission received a complaint by the company SHINE Europe B.V., the European arm of SHINE Technologies LLC ("SHINE" or "the complainant") ([52]). In the course of 2023 and 2024, SHINE sent to the Commission further submissions substantiating its complaint and had several meetings with the Commission services.

(56) SHINE is currently constructing two medical radioisotope production facilities in Janesville, Wisconsin (USA), and plans to build a third one in Veendam, the Netherlands. SHINE aims to produce essential isotopes by using an innovative

([48]) NucAdvisor 2021, p. 153.

([49]) NucAdvisor 2021, p. 153.

([50]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155. The SMART project (also known under the name of Lighthouse), mentioned by NucAdvisor 2021 besides the SHINE project, aimed at developing a photonuclear-based installation for the production of medical isotopes; however, it was demised in March 2023.

([51]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

([52]) SA.105800 | SHINE Complaint against PALLAS State aid.

neutron-generator-based technology, thereby eliminating the need for a nuclear research reactor. More precisely, SHINE is currently being authorised by the US Authorities to produce two diagnostic isotopes, namely Mo-99 and Xenon-133 (Xe-133), and two therapeutic isotopes, namely Iodine-131 (I-131) and Lu-177 ([53]). Therefore, SHINE is a competitor of reactors, such as PALLAS, that produce medical isotopes.

(57) The innovative SHINE technology, which will allow producing medical isotopes without a research reactor, will cover both the irradiation step resulting in the creation of radioisotopes (as described in recital (10), point a)) and the processing step resulting in the production of radiochemicals (as described in recital (10), point b)) ([54]). Therefore, SHINE and PALLAS will compete with each other to sell their respective radiochemicals to pharmaceutical companies that will carry out the labelling step (as described in recital (10), point c)) whereby radiochemicals are made into radiopharmaceuticals that can be administered to patients. In addition, the complainant points out that competition between SHINE and PALLAS will also occur indirectly when the PALLAS reactor will supply irradiated targets to processing facilities for the production of radiochemicals.

(58) SHINE, besides developing its innovative technology allowing to produce medical isotopes without a research reactor, can also rely on research reactors to produce medical isotopes ([55]). However, such a reactor-based production is only a back-up option, because SHINE aims to fully deploy its innovative technology that will not depend on research reactors ([56]). For the time being and as of 2024, SHINE has been producing Lu-177 in the US based on the irradiation capacity of the Missouri University Research Reactor (thereby making use of the back-up option). However, SHINE has not yet started production based on its innovative technology that will not depend on research reactors.

(59) According to information provided by SHINE in a meeting with the Commission services in May 2024, SHINE plans to start commercial production based on its innovative technology (that will not depend on research reactors) in the next few years.

(60) According to the complainant, the Dutch Authorities' aid in favour of the PALLAS project is likely to have significant distortive effects on the markets for essential medical isotopes like Mo-99 and Lu-177, as follows:

a) Reduction of production efficiency: As a result of the subsidised activity of PALLAS, competitors are likely to experience a reduction in demand, which

([53]) As regards SHINE being licensed in the US to produce Mo-99, Xe-133 and I-131, see NucAdvisor 2021, p. 16. As regards SHINE's plans to produce Lu-177, see the 2022 report by the Reactor Instituut Delft ("the Delft report"), available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

([54]) The innovative SHINE technology, while not using the irradiation capacity of a nuclear research reactor, still foresees the irradiation of targets to create radioisotopes (irradiation step) and the production of radiochemicals by separating a given isotope from the irradiated target (processing step).

([55]) See section "13. SHINE processing and distributing of either reactor-based ^{177}Lu, or SHINE-facility produced ^{177}Lu" on page 18 of the Delft report.

([56]) Delft report, page 13.

would lead to an increase in their average costs. The demand would instead be captured by a less efficient undertaking, the aid beneficiary. In fact, it is likely that PALLAS would be less efficient than its competitors due to its need for substantial aid, and as no private financing is available for its development, in comparison with entrants, such as SHINE, that would operate on a commercial basis. As concerns support granted by the US Government to SHINE, the complainant points out that the US Department of Energy (DOE) subsidy programme, under which SHINE has received funds, is a general scheme, open not only to SHINE but also to all other qualifying companies who make competing bids to get access to the public funds. In addition, under the DOE subsidy programme, bidders will only get the public funds if they can find themselves a matching private financing of the same amount.

b) Loss of profits by competitors and entry deterrence: The aid would allow PALLAS to sell below its average production costs, reducing market prices and the margins of existing competitors, which may lead to new, more efficient, competitors staying out of the market. To help mitigating this risk, in SHINE's view, PALLAS has to adhere to full cost recovery (FCR) in the pricing of its products.

c) Reduction of competitors' incentives to innovate: If a State-supported facility introduces additional production capacity (that would not have existed in the absence of the aid), thereby making competitors' production less profitable, private funders are disincentivised from investing in (new) technologies for the creation of isotopes. The aid will thus significantly raise entry barriers to the market, thereby lessening incentives to lower costs in the industry and jeopardising the long-term supply of Mo-99 and Lu-177. In this regard, the complainant states that the Dutch Government's support in favour of PALLAS is the main reason why the SMART project (Belgium) was abandoned in March 2023. The complainant also states that the Dutch Government's support in favour of PALLAS is having a chilling effect on SHINE's investors at a critical time for the construction and scaling of SHINE's production facilities in the USA and in Veendam (the Netherlands). The complainant further alleges that the Dutch Government's support in favour of PALLAS is discouraging customers from entering into agreements for the future delivery of products (take-off contracts) with SHINE, and that this customer reluctance makes it more difficult for SHINE to complete its engagements to build, expand and market radioisotopes. The complainant further refers to its decision in August 2023 to lay off some of its staff in the US, mainly members of the team in charge of developing SHINE's Mo-99 production: according to the complainant, this decision is a direct consequence of the Dutch Government's support in favour of PALLAS, which has pushed SHINE to focus on its objective of producing Lu-177 and to delay its objective of producing Mo-99.

(61) As regards the possible implementation of FCR pricing by the aid beneficiary, mentioned under recital (60) point b), the complainant points out the following:

1) According to the market consultation about nuclear power plants published by KPMG in July 2021 ([57]), market rates for loans aimed at financing a project similar to PALLAS could be over 12% interest per annum. Based on a study made by Oxera for the complainant, the estimate of the overall return that would be required by a hypothetical private investor to finance the PALLAS project ranges between 14.1% and 18.2% (on a nominal basis). However, the Dutch Authorities' loans to the PALLAS Foundation bear a significantly lower interest rate, i.e. 1.5%.

2) By providing State aid in the form of financing at a subsidised cost, the Dutch Government lowers the level of return that PALLAS would have to generate from its activities in order to remunerate its capital. The aided company could therefore set a lower price to comply with the FCR principle, compared to a competitor that faces a higher capital cost (i.e. due to higher interest rate charges).
   This mechanism is particularly clear under the methodology proposed by the OECD-NEA to implement FCR pricing for the irradiation of Mo-99. According to this methodology, the price of Mo-99 irradiation should be at least equal to a so-called 'levelised unit cost' (LCUM), which measures the average net present cost of a unit of Mo-99 (i.e. a 6-day Ci ([58])) for a reactor, over its lifetime. In order to calculate this, it is necessary to use a discount rate to express all costs (i.e. the initial investment costs, ongoing operating costs, etc.) on a comparable basis. A high discount rate would result in initial investment costs having a higher impact on the LCUM. For a private investor, the discount rate to be used should be its (weighted average) cost of capital ([59]). By reducing PALLAS's cost of financing, the Dutch Government therefore lowers the LCUM of PALLAS, i.e. the minimum price that PALLAS could profitably charge.

3) A genuine FCR pricing should cover the following cost items: all start-up costs covering project design, safety analysis, environmental analysis etc; capital costs, expressed in a depreciation schedule covering both the initial infrastructure and the expected refurbishments during the lifespan of the PALLAS reactor; capital financing costs; general costs, including human resource management, financial and accounting services, legal services, IT, government relations, site infrastructure support like roads and grounds, site utilities, site and facilities maintenance; all operational costs, like operation and maintenance staff, reactor fuel, utilities (energy, water, etc.), security; waste management; decommissioning costs. In addition, the complainant considers that a genuine FCR pricing by PALLAS should also ensure the allocation of costs to the irradiation of specific medical isotopes: the percentage of costs to be charged to medical isotope customers should take into account the fraction of thermal neutrons needed for the irradiation of

([57]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([58]) '6-day Ci' stands for the amount of radioactivity remaining in the radioisotope six days after the day of measurement.

([59]) Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union, OJ C 262, 19.7. 2016, par. 102.

those products in relation to the total number of thermal neutrons used for other products and services.

4) It is possible that the Dutch State, which would own and control PALLAS, might decide to pursue public policy objectives rather than operate the facility in a profitable manner according to market mechanisms. Potential competitors contemplating entry in the market might be particularly deterred from doing so if they expect that PALLAS could operate in a way that would not comply with the FCR principle. The Dutch Government has alternated between indicating that PALLAS would operate based on FCR or based on 'market prices'. The notion of 'market prices' is vague and could leave the door open to pricing below FCR-compliant levels, if other competitors are able to compete at lower prices than PALLAS's FCR-compliant level (even when taking into account the lower, aided financing cost of PALLAS).

For these reasons, the complainant considers that, in order to mitigate the aid's distortions of competition, PALLAS should be required to charge not just 'market prices', but genuine FCR-compliant prices as described under points 2) and 3) above. The complainant also considers that an independent auditor should be appointed to annually check PALLAS' accounts in order to ensure that PALLAS actually complies with the necessary FCR pricing.

(62) Based on a study commissioned by the complainant, the latter considers that, in light of the existing plans for the construction of additional capacity in Europe and in the world, there will be sufficient Mo-99 production capacity to cover the estimated worldwide demand (including the recommended outage reserve capacity), even without the PALLAS reactor. Although this is conditional on planned capacity from additional projects coming online as expected, the complainant considers that, even if some of the new projects were delayed, there is the potential to prolong the operation of some of the reactors that are currently planned to be decommissioned. Based on its opinion that there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant holds that the State aid in favour of the PALLAS project may not be justified by the need to remedy a market failure. The complainant further considers that, even assuming that State aid in favour of the PALLAS reactor (the main element of the PALLAS project) may be justified by the need to remedy a market failure, such a market failure certainly does not exist as regards a processing facility providing pre- or post-irradiation services like the Nuclear Health Centre (the other element of the PALLAS project), because a facility like the Nuclear Health Centre (as opposed to a reactor) can be built without major technical and financial difficulties. Therefore, in the complainant's view, any State aid to the PALLAS reactor should not be extended to the Nuclear Health Centre.

(63) In order to substantiate its claim that PALLAS is not required to address a market failure because there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant further refers to the report of a 4 December 2020 meeting of the NRG PALLAS Steering Committee ([60]),

([60]) The NRG PALLAS Steering Committee (Stuurgroep Pallas NRG) is made up of representatives of the Ministry of Health, Welfare and Sport (ministerie van Volksgezondheid, Welzijn en Sport – VWS)

which contains the following text: "*5.i.2e asks a question in response to the image on page 8 of the presentation - the graph shows the development of supply and demand for Mo-99 in Europe, which, in addition to the development of existing capacity, also includes the capacity of the three most important new initiatives. Can it be concluded from this that if one of the initiatives goes ahead, self-sufficiency (in Europe) will be in order? 5.i.2e indicates that this image shows more overlap between SHINE and Pallas than he previously assumed. This is a crucial point, also for the public variant. How does KPMG estimate SHINE's chances of success? How indispensable is the Pallas reactor if SHINE succeeds? 5.i.2e indicates that Pallas is not indispensable.*" ([61]). According to the complainant, this text shows that since 2020 the Dutch Authorities have been aware that the implementation of the SHINE technology would make PALLAS not indispensable and, therefore, that PALLAS is not needed to ensure security of supply and Europe's self-sufficiency as regards the main diagnostic isotope Mo-99.

(64) The complainant further submits that, besides being unnecessary to ensure security of supply and Europe's self-sufficiency as regards the main diagnostic isotope Mo-99, PALLAS is equally unnecessary to ensure security of supply and Europe's self-sufficiency as regards the main therapeutic isotope Lu-177. In this regard, the complainant refers to the 2022 report "Production of ^{177}Lu using the SHINE technology" made by the University of Delft at the request of the Dutch Ministry of Health ([62]). According to the complainant, this report concluded that the planned SHINE production of Lu-177 is sufficient to supply the global market, thereby confirming that PALLAS is not required to address a market failure.

(65) In addition, as regards the production of Lu-177, the complainant states that SHINE can and will produce Lu-177 without using Ytterbium-176 (Yb-176) sourced in Russia, whereas the HFR produces Lu-177 by using Yb-176 sourced in Russia and the PALLAS reactor (as the successor of the HFR) will probably do the same. Therefore, the complainant considers that, despite allegations by the Dutch Authorities that the PALLAS project is necessary for the strategic

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and of the Ministry of Economic Affairs and Climate (ministerie van Economische Zaken en Klimaat – EZK).

([61]) The report of the 4 December 2020 meeting of the NRG PALLAS Steering Committee makes part of a set of documents released by the Ministry of Health in March 2024 in response to a request for access to information. All these documents are available at Besluit op Woo-verzoek over financiering PALLAS-Project | Woo-besluit | Rijksoverheid.nl. More precisely, the report of the 4 December 2020 meeting of the NRG PALLAS Steering Committee can be read on pages 65 to 69 of the "Documents part 4" available at Documenten deel 4 bij besluit op Woo-verzoek over financiering PALLAS-Project | Publicatie | Rijksoverheid.nl. The passage of this meeting report to which the complainant refers reads as follows in the original Dutch: "*5.i.2e stelt een vraag n.a.v. de afbeelding op pagina 8 van de presentatie - de grafiek geeft de ontwikkeling van vraag en aanbod weer voor Mo-99 in Europa waarbij naast de ontwikkeling van de bestaande capaciteit tevens de capaciteit van de drie belangrijkste nieuwe initiatieven is opgenomen. Kan hieruit worden opgemaakt dat als één van de initiatieven doorgaat, de zelfvoorzienendheid (in Europa) op orde is? 5.i.2e geeft aan dat deze afbeelding meer overlap laat zien tussen SHINE en Pallas dan dat hij tot dusver aannam. Dit is een cruciaal punt, ook voor de publieke variant. Hoe schat KPMG de kansrijkheid van SHINE in? Hoe onmisbaar is de Pallas-reactor als SHINE doorgaat? 5.i.2e geeft aan dat Pallas niet onmisbaar is.*"

([62]) This report by the Reactor Instituut Delft of the University of Delft is available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

autonomy of Europe, the production of Lu-177 by the PALLAS reactor risks prolonging Europe's strategic dependency on Russia as regards the sourcing of Yb-176.

(66) Furthermore, in the complainant's view, the aid does not achieve an objective of common interest because the market is already ensuring the production of key medical isotopes in the EU even without any State support for the construction of facilities. SHINE is a prime example of such a market provider and will also be based in the Netherlands with its facility in Veendam. In this regard, the complainant mentions the opinion of June 2023 whereby the Dutch National Growth Fund advised the Dutch Government not to use that Fund's budget to finance the PALLAS project. The complainant points out that this opinion is based on the Fund's finding that the PALLAS reactor, while being very important for the Netherlands and the EU from a strategic and social perspective, would not contribute to the earning capacity and innovation objectives pursued by the Fund ([63]).

(67) Finally, the complainant considers that, to the extent that PALLAS would also carry out other activities than the production of commercial isotopes (e.g. research and development), the aid is not an appropriate instrument to support these activities. Indeed, the creation of market distortions by enabling the production of key commercial isotopes such as Mo-99 and Lu-177 is not an appropriate tool to achieve these goals. For example, in the USA, policies exist to prevent the Federal Government through the US Department of Energy from producing commercially available isotopes to avoid competition with the private market.

4. MARKET INFORMATION

(68) On 21 October 2022, the Commission received a letter by a citizen. In this letter, the citizen expresses general concerns about the environmental impacts of the PALLAS reactor and puts forward that medical isotopes can be produced by using the alternative technology being developed by the company SHINE, without the need for a nuclear reactor.

([63]) The opinion issued by the Dutch National Growth Fund in June 2023 can be found here: Adviesrapport derde beoordelingsronde commissie Nationaal Groeifonds | Rapport | Nationaal Groeifonds. The PALLAS project is discussed on pages 30 and 151 to 154. The complainant mentions the following statement on page 30: "*Het advies van de commissie is om aan dit project geen middelen toe te kennen. Het Groeifonds is opgezet om met impulsfinanciering het duurzame verdienvermogen en de innovatiekracht van Nederland te bevorderen. De commissie vindt de PALLAS-reactor zeer belangrijk voor Nederland en de EU vanuit strategisch en maatschappelijk perspectief, maar is niet overtuigd van de bijdrage aan het verdienvermogen en de innovatiekracht van het voorstel. Het Groeifonds is daarom volgens de commissie niet het juiste instrument om dit voorstel te financieren. Daarnaast is de commissie onvoldoende overtuigd dat Europese cofinanciering geen optie is.*" ("The committee's advice is not to allocate resources to this project. The Growth Fund was set up to promote the sustainable earning capacity and innovative power of the Netherlands with impulse financing. The committee considers the PALLAS reactor to be very important for the Netherlands and the EU from a strategic and social perspective, but is not convinced of the proposal's contribution to the earning capacity and innovative power. The Growth Fund is therefore, in the committee's opinion, not the right instrument to finance this proposal. In addition, the committee is insufficiently convinced that European co-financing is not an option.").

(69) On 25 October 2022, the Commission received a letter by another citizen. In this letter, the citizen expresses general concerns about the environmental impacts of the PALLAS reactor and puts forward that medical isotopes can be produced by using alternative technologies, without the need for a nuclear reactor.

(70) On 26 April 2023, the Commission received a letter by a competitor of PALLAS, i.e. the company NorthStar, which produces medical radioisotopes in the United States. In this letter, NorthStar calls on the Commission to consider, when assessing State aid in favour of the PALLAS project, the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical isotopes by implementing the full cost recovery principle.

(71) On 5 December 2023, the Commission received a letter by the U.S. Mission to the European Union in support of SHINE Europe's complaint regarding the Dutch Government's aid in favour of the PALLAS project. In this letter, the U.S. Mission to the European Union puts forward that the aid at issue would be incompatible with the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical isotopes by implementing the full cost recovery principle.

5. POSITION OF THE NETHERLANDS

(72) The Netherlands claims that the notified measures constitute compatible State aid under Article 107(3)(c) TFEU, because they pursue several objectives of common interest in a necessary and proportionate way, and because they do not cause any undue distortion of competition and trade.

5.1. Objectives of common interest

(73) The Dutch Government explains that NewCo will be active in:

- the development, production and provision of medical radioisotopes for diagnostic and therapeutic purposes, and the development of new therapies on the basis of such isotopes;
- the production of industrial radioisotopes;
- conducting nuclear technology research;
- maintaining a high quality of nuclear knowledge infrastructure;
- providing services in relation to dismantling radioactively contaminated installations, and management of (historic) radioactive waste;
- the construction of a new advanced nuclear reactor (PALLAS) and a new Nuclear Health Centre (NHC) dedicated to the production of medical isotopes and medical nuclear technological research.

(74) Based on the above, the Dutch Government has identified six objectives of common interest pursued by the notified aid measures:

1. Providing citizens with a high level of health protection and healthcare by ensuring security of supply of medical radioisotopes;

2. Promoting and facilitating nuclear research, including new nuclear power generation technologies;

3. By realising 1 and 2, contributing to the strategic autonomy of the EU;

4. Contributing to the climate change mitigation objectives;

5. Limiting transport of nuclear materials throughout the EU;

6. Promoting nuclear non-proliferation.

5.1.1. Providing citizens with a high level of health protection and healthcare by ensuring security of supply of medical radioisotopes

(75) Only a limited number of reactors currently produce the majority of the medical isotopes in the world. For instance, the HFR in Petten (the Netherlands) serves approximately 30% of this world market, and approximately 70% of the European market. The current reactors are mainly located in the EU and almost all of them are approaching the end of their operational lifetime. Both the NucAdvisor and the Technopolis studies argue that this ageing infrastructure is unable to meet the increasing demand, and it is therefore expected that from 2030 onwards the European security of supply will be increasingly under pressure ([64]). Moreover, by 2040 Europe's reactors (HFR in the Netherlands, BR-2 in Belgium, MARIA in Poland and LVR-15 in the Czech Republic) will be out of operation ([65]).

(76) Besides the Netherlands, other European countries are investing in new research reactors that could help solve the supply problem. The French Jules Horowitz Reactor (JHR), which is currently under construction and planned to be completed ca. 2030, and the Belgian Multi-purpose hYbrid Research Reactor for High-tech Applications (MYRRHA), which is aimed to replace the BR-2 reactor and planned to be completed ca. 2037, have indicated that they will produce medical isotopes. The relatively young (2004) German Forschungsreaktor München II (FRM-II) will undergo design modifications to be able to produce Mo-99. However, these reactors will focus on research, and will therefore have limited capacity to produce medical isotopes. This is why their combined capacity will not be sufficient to meet European demand for medical isotopes ([66]).

(77) New technologies under development aim at large-scale production of isotopes such as Mo-99, Xenon-133 (Xe-133) and Iodine-131 (I-131) ([67]). Examples of such innovative market players include the US-based SHINE (with an intended European production site in Veendam, the Netherlands) and the Belgian SMART. SMART was intended to mainly produce Mo-99, but the project was ended in March 2023. SHINE is currently being licensed in the US for Mo-99, I-131 and Xe-133 production. In addition, SHINE plans to produce the therapeutic isotope Lu-177 ([68]). However, such innovative projects are often based on laboratory-

([64]) NucAdvisor 2021, p. 12, p. 46, p. 151; Technopolis 2021, p. 1, p. 31.

([65]) In June 2023, the Polish Government announced that the MARIA reactor will be refurbished so as to prolong its operation until 2050.

([66]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

([67]) NucAdvisor 2021, p. 15.

([68]) As SHINE claims to be able in the future to produce Lu-177 without a nuclear reactor, the Dutch Ministry of Health, Welfare and Sports tasked the Reactor Instituut Delft (RID) to check the technological feasibility of this claim. In March 2022, the RID presented its report (177Lu productie

scale successes, which are insufficient to prove whether these new technologies can provide a relevant industrial alternative to research reactors ([69]). In this regard, the Dutch Government points out that, contrary to the complainant's statement (recital (60)), the demise of the SMART project in March 2023 was mainly due to intrinsic technical difficulties resulting in prohibitive costs ([70]). According to the Dutch Government, the demise of the SMART project (despite the support received from the Belgian Authorities) confirms that, while new technologies should be encouraged, they cannot be solely relied upon to ensure security of supply.

(78) The limited production capacity of existing and future reactors, the remaining uncertainty about the technical and commercial feasibility of innovative systems under development and the limited capability of such innovative systems to produce simultaneously different isotopes might lead to a shortage of supply and a dependence on countries outside Europe. Such dependence can be minimised if investments are made in Europe in a mix of technologies that would include, in addition to innovative systems such as SHINE, at least one new reactor ([71]).

(79) As regards the new reactor that is needed in Europe, experts view PALLAS as the most likely candidate ([72]). According to the plan pursued by the Dutch Authorities until 2020, the PALLAS reactor was to be the first privately financed reactor in the world. However, the unsuccessfulness of the Dutch Authorities' attempts to find private financing for the PALLAS project shows that there is a market failure. Such attempts were made first by ECN-NRG in the period 2008-2012, and then by the PALLAS Foundation in the period 2016-2020.

(80) As regards the attempts to find private financing made by the PALLAS Foundation between 2016 and 2020, the Dutch Authorities observe that, already in 2012, when the Dutch Government decided to establish the PALLAS Foundation, the industry represented in the supply chain of medical isotopes was, or could have been, fully aware of the Dutch Government's intention to find private funding for the PALLAS project, because it was widely known that the PALLAS Foundation's mission would include the search for private investors who would build and operate the project. Industry's awareness of this intention was further increased after the PALLAS Foundation was established in late 2013 and started operating in 2014. Additionally, the Dutch Government's intention to find private funding was communicated broadly and publicly ([73]). The Dutch

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met de SHINE technologie | Rapport | Rijksoverheid.nl), which concluded that it should be possible to produce Lu-177 with SHINE's accelerator-driven subcritical reactor.

([69]) NucAdvisor 2021, p. 87; Technopolis 2021, p. 55, p. 58, p. 63.

([70]) ASML's medical-isotope brainchild doesn't make it to the finish line – Bits&Chips (bits-chips.nl) and Escalating complexity thwarts industrialization of non-nuclear radioisotope production – Bits&Chips (bits-chips.nl).

([71]) NucAdvisor 2021, p. 17.

([72]) See the 2020 report by the Dutch National Institute for Public Health and the Environment (RIVM) Supply security for medical radionuclides - additions 2020 (rivm.nl), p. 21, as well as the "European study on medical, industrial and research applications of nuclear and radiation technology" published by the European Commission in 2019 (https://data.europa.eu/doi/10.2833/511137), p. 143.

([73]) See e.g.,: a) 2015-05-15: https://www.nuklearforum.ch/de/news/fortschritte-beim-pallas-projekt, including the statement: "Das restliche Kapital soll während der zweiten Projektphase – sobald die

Authorities point out that this transparency about the PALLAS Foundation's mission was combined with a process that did not include public invitations (e.g. in newspapers) but was targeted only towards potentially relevant investors. However, in identifying such potentially relevant investors, a broad approach was used ensuring that the targeted process covered a wide range of suitable categories of strategic and financial investors. This targeted approach was necessary due to the numerous risks associated with a nuclear project such as PALLAS and to the long and intense due diligence necessary for a private investor to be convinced to invest in such a project. Therefore, the Dutch Authorities consider that the process carried out by the PALLAS Foundation between 2016 and 2020 to find private financing did not exclude any investor that could be reasonably considered to be both suitable for and potentially interested in financing the PALLAS project.

(81) The abovementioned targeted process carried out by the PALLAS Foundation between 2016 and 2020 to find private financing can be described as follows:

- The PALLAS Foundation and its consultant ([74]) developed and maintained a dynamic list of potential investors, identifying potential equity as well as debt providers.
  As regards equity providers, the list included potential investors in various categories like pharmaceutical companies, industrial investors (e.g. construction and installation companies that potentially can support a nuclear project), infrastructure investors that could absorb the risk profile of the PALLAS business case, and the private equity sector, including large pension funds that participate in or collaborate with private equity funds. Special attention was given to investors that already had an exposure to the pharmaceutical sector and were familiar with the risks and opportunities associated to working in the (nuclear) pharmaceutical supply chain. Among those were […].
  Less focus was put on credit providers, assuming that credit providers would step in as soon as the equity providers would be known.

Baubewilligung vorliegt – mit Hilfe privater Investoren beschafft werden."; b) 2015-10-24: https://www.fluxenergie.nl/geen-nieuwe-pallas-reactor/ refers to publications by LAKA and public broadcasters VPRO (ARGOS) on the need to find private investors to obtain continued support from the Region of Noord-Holland; c) 2019-06-05: https://www.telegraaf.nl/financieel/1125726603/pensioengeld-pggm-voor-kernreactor-petten refers to unconfirmed rumours of PGGM stepping in as private investors in PALLAS; d) 2019-07-11: https://www.nucnet.org/news/government-announces-progress-on-pallas-reactor-7-4-2019, including reference to a letter to the Dutch Parliament regarding progress on the interest of private investors; e) 2020-03-13: https://www.nucnet.org/news/preparations-to-continue-after-dutch-council-of-state-approves-zoning-3-5-2020, including the sentence "Its remit also included developing a business case and arranging private financing for the construction and commissioning phase of the new unit."; f) 2020-12-12: https://www.bnr.nl/nieuws/gezondheid/10427930/pallas-reactor-noodzakelijk-voor-leveringszekerheid-medicijnen, an interview with CEO PALLAS by broadcaster BNR (associated with the Dutch Financieel Dagblad) clearly mentioning the search for private investors.

([74]) The PALLAS Foundation used a tender procedure to identify a consultant who would reach out to the international investment community. Three renowned companies participated in this tender, namely […]. The tender was awarded to […] because of its extensive experience in developing public-private partnerships.

- Due to anticipated discussions with various governments and government agencies about international investments in and private ownership of nuclear facilities in the Netherlands, the dynamic list was continuously screened and reduced to potential investors from NATO countries and Australia. The thus short-listed investors were contacted by the PALLAS Foundation and its consultant to probe their potential interest. In total, 41 potentially interested parties were identified, of which over 20 were approached; in the end, conversations were held with more than 15 parties. Several of them stepped into the due diligence process.

  A full due diligence process was completed by […] potential private investors […].

(82) Based on […] received at the end of the process described above (recital (81)), the Dutch Authorities have concluded that private financing for the PALLAS project is not feasible without far-reaching guarantees to be provided by the Dutch Government on matters such as:

a) Revenue uncertainty: Private investors and financiers often require a relatively high level of certainty on off-take, underpinned by long term contracts. However, the current practice in the diagnostic medical isotope (Mo-99) market is contracts that run up to circa four years. The market for therapeutic isotopes is still in development and hence revenue uncertainty remains.

b) CapEx ([75]) uncertainty: In most nuclear reactor projects (power reactors as well as research reactors) substantial CapEx overruns have been reported. This is for instance the case for Hinkley Point C in the UK (circa EUR 5.8 billion overrun) ([76]), Flamanville 3 in France (circa EUR 9.4 billion) ([77]) and the Jules Horowitz reactor in France ([78]). Increases often result from regulatory requirements and first-of-a-kind risks. Although private investors are willing to take some construction risks (as shown by the market consultation about nuclear power plants published by KPMG in July 2021 ([79])), they are not willing to take black swan risks and regulatory risks (i.e. CapEx increases due to design changes required by nuclear regulators). For this, government guarantees are required (see the same KPMG's 2021 market consultation).

c) Risks relating to the required nuclear and conventional licences: Private investors are not willing to bear the licence risk (as evidenced by KPMG's 2021 market consultation). For the PALLAS reactor specifically, this

([75]) "CapEx" (or "CAPEX") stands for capital expenditures.

([76]) UK government, https://www.gov.uk/government/collections/hinkley-point-c, 2016.

([77]) EDF, https://www.edf.fr/en/the-edf-group/dedicated-sections/journalists/all-press-releases/update-on-the-flamanville-epr, 2022.

([78]) NUC Net, https://www.nucnet.org/news/construction-starts-on-france-s-jules-horowitz-research-reactor, 2007 and https://inis.iaea.org/search/searchsinglerecord.aspx?recordsFor=SingleRecord&RN=46098438.

([79]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

concerns the risk that the irrevocable construction licence would not be obtained (or only under certain stringent conditions). Hence, private investors require either a guarantee or an insurance on their investments to that point.

d) NRG legacy risks: Private investors are not willing to take on any risks related to NRG's history. This includes risk resulting from the HFR operations, unplanned unavailability, costs related to decommissioning of the nuclear infrastructure at the Petten site or costs related to the handling of historic nuclear waste. Risks associated with the HFR up to the operating date of the PALLAS reactor can seriously impact the business case. Guarantees and/or risk sharing facilities have been requested by private investors.

e) Decommissioning: The Dutch Government requires a decommissioning facility for the PALLAS reactor to be fully funded upfront, i.e. at the start of the reactor's hot-commissioning. Private investors are not willing to provide this decommissioning fund upfront (as is confirmed by KPMG's 2021 market consultation), but rather prefer a build-up over time. In the interim, a government guarantee or other type of government funding is required.

If the Dutch Government provided such far-reaching guarantees, this would lead to a situation where private parties own the project, while substantial risks remain with the Dutch Authorities. Since this would not result in a fair risk-return balance for the public authorities, in 2020 it was concluded that this would be an unacceptable situation for the Dutch Government ([80]), who has therefore decided to use public funds to build the PALLAS project.

(83) The Dutch Authorities' conclusion that the market is not willing to finance the PALLAS project without far-reaching guarantees to be provided by the Dutch Government was confirmed by discussions with the European Investment Bank (EIB). In 2019, the PALLAS Foundation consulted the EIB about the PALLAS project's eligibility for financing by the Bank. The EIB concluded that, given the project's risks, it was difficult to consider it bankable without proper mitigants in place. The EIB pointed out that "*all comparable cases reviewed featured strong levels of underlying public/state support for the mitigation of key risks*" ([81]). At meetings held in July 2021 and October 2022 between the Dutch Authorities and the EIB, the latter confirmed its earlier assessment that financing by the EIB would only be possible with the backing of the Netherlands in the form of State guarantees.

(84) European studies ([82]) have also concluded that, for large medical isotope production facilities, fully private initiatives are not feasible, due to high investment costs, long payback periods, market uncertainties and lagging implementation of full cost recovery. As a result, public financial support is essential for the realisation of such production facilities.

([80]) Kamerstukken II 2020/21, 33626, nr. 13.

([81]) "Pallas Reactor - Preliminary advisory considerations for the project", European Investment Bank, June 2019.

([82]) See e.g. NucAdvisor 2021, p. 18, p. 146, p. 156.

(85) Research reactors are generally publicly supported worldwide ([83]). Examples include the Belgian BR-2 research reactor owned by the Belgian government ([84]), the LVR-15 reactor funded by the Czech government ([85]) and the MARIA reactor owned by the Polish government ([86]). The HFR too was realised with public funding, provided by the Dutch Government.

(86) New initiatives are also largely publicly funded. For instance, the MYRRHA reactor has received circa EUR 558 million of financial support from the Belgian government ([87]) and the Jules Horowitz reactor is partly owned by the Commissariat à l'Énergie Atomique of the French government ([88]). As NucAdvisor confirms, this is also the case outside Europe: for instance, in the US "*public support is also a key factor of success for centralized installations more dedicated to radionuclides production, like SHINE or NorthStar, as can be seen in Appendix G. Such support is justified by other considerations as well, like self-reliance objectives*" ([89]).

(87) Based on the above, the Dutch Authorities consider that PALLAS, as the new reactor necessary to ensure security of supply of medical isotopes in Europe, can only be realised with public financing.

5.1.2. Promoting and facilitating nuclear research, including new nuclear power generation technologies

(88) Compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production. However, the PALLAS reactor and the NHC will still continue many of the research, development and innovation (R&D&I) activities already carried out in the HFR. Indeed, the second main public function of NewCo will be to strengthen nuclear research in future health and energy applications. In this regard, the Dutch Government indicates that, out of the overall CapEx investments in the PALLAS project, up to [10-25]% is dedicated to specific R&D&I facilities and equipment, such as irradiation facilities with specific characteristics, experimental facilities, in-building laboratories and hot labs, waste treatment facilities and all design, engineering and licensing work associated with these facilities. Over time, NewCo's operational costs related to R&D&I are estimated to vary between [5 and 30%] of the overall operational costs, depending on market developments in R&D&I in the fields of health and energy.

(89) As regards R&D&I in the field of health, NewCo's ambition is to collaborate with University Medical Centres and pharmaceutical companies that are developing new isotopes-based medicines and are looking for a strong supply chain partner who can provide ready-made radiochemicals, or even radiopharmaceuticals, to

([83]) NucAdvisor 2021, p. 85.

([84]) SCK CEN, https://www.sckcen.be/nl/over-sck-cen/bedrijfsinformatie/geschiedenis.

([85]) Centrum výzkumu Řež (cvrez.cz).

([86]) National Centre for Nuclear Research Swierk, https://www.ncbj.gov.pl/en.

([87]) https://myrrha.be/about-myrrha.

([88]) https://jhrreactor.com/en/organisation/#consortium.

([89]) NucAdvisor 2021, p. 86, Appendix G ("US public support to radionuclides supply chain developments") p. 251.

support the critical phases of clinical trials. NewCo is to be such a partner, thanks to the following three activities:

a) Innovation in the FIELD-LAB laboratory, which supports the development of new nuclear drugs for cancer treatment by University Medical Centres (UMCs), start-ups and innovative pharmaceutical companies, and supplies small samples of ready-made radiochemicals for clinical trials ([90]).

b) Processing in the NHC, which will provide an efficient higher volume production of radiochemicals or radiopharmaceuticals, and a series of supporting services.

c) Irradiation in the HFR and in the PALLAS reactor, which will provide high reliability, availability and capacity for a wide range of medical isotopes.

This integrated offer, combining irradiation, processing and innovation, will be made available to research partners (UMCs and pharmaceutical companies) on a non-exclusive basis, and will significantly lower the burden of sourcing and processing radioactive samples, first for R&D&I and later for production.

(90) As regards R&D&I in the field of energy, the Dutch Authorities state that there is a growing interest, from both the public and the private sector, in expanding the nuclear energy component as part of a low carbon energy mix. NewCo will serve this growing demand in particular by contributing to R&D&I in the continued safe operation of existing nuclear power plants, in the development of small modular reactors (SMRs) and in promising Generation IV designs such as thorium-fuelled molten salt reactors and high temperature reactors. NewCo, as the successor of NRG, will continue to invest in its diverse set of specialists and maintain the expertise built up through decades of R&D&I in national and international multi-party public/private collaborations, such as the OECD-NEA's FIDES group and the Euratom R&D programme. These capabilities will enable NewCo to offer a full and balanced portfolio of R&D&I studies and services for future technology generations. Seven relevant areas have been defined in NewCo's R&D&I programme for nuclear energy: Fuel & Material Research; Long Term Operations; Nuclear Modelling & Simulation; Nuclear Safety & Compliance; Radiation Protection; Radioactive Waste Management; Innovative Nuclear Systems.

5.1.3. By realising 1 and 2, contributing to the strategic autonomy of the EU

(91) The Dutch Authorities stress that, in order to decrease the European Union's reliance on non-EU countries, new investments are necessary, as existing installations cannot meet European needs in the long term. As the NucAdvisor study puts it: "*the probability of meeting ^{99}Mo European needs with European means degrades with time, and […] the two reactors remaining after 2040 are unable to entirely cover EU needs*" ([91]). NucAdvisor describes a scenario B.2

([90]) In the last two years, the FIELD-LAB programme has already provided an excellent collaboration opportunity for UMCs and innovative companies.

([91]) NucAdvisor 2021, p. 124.

where the realisation of at least one new research reactor in the EU will minimise the reliance on foreign sources for isotope supply ([92]). The Dutch Authorities assert that it is therefore clear that the PALLAS reactor is necessary for the European strategic autonomy in the field of medical isotopes.

(92) As regards the complainant's argument that the PALLAS reactor will probably produce Lu-177 by using Yb-176 sourced in Russia and that, therefore, the production of Lu-177 by the PALLAS reactor risks prolonging a strategic dependency on Russia (recital (65)), the Dutch Authorities acknowledge that currently most of the Yb-176 available on the market originates in Russia, with some market players (such as Kinetrics in Canada, ORANO in France, Eckert & Ziegler in Germany, and SHINE in the USA) aiming at developing alternative sources of Yb-176. However, the European strategic autonomy to which the PALLAS reactor will contribute relates to the medical isotopes administered to patients, not to the inputs used in their production. In addition, the PALLAS reactor and the NHC will also carry out research into recycling technology for the re-use of Yb-176 targets.

5.1.4. Contributing to the climate change mitigation objectives

(93) In 2022, the European Commission approved a Complementary Delegated Act ([93]) adding, under strict conditions, specific nuclear and gas energy activities in the list of 'transitional' economic activities covered by the EU Taxonomy. The Taxonomy Regulation ([94]) provides investors with guidance on economic activities that can be considered environmentally sustainable.

(94) Through its R&D&I programmes, NewCo will support and contribute to the development of these transitional activities, such as the pre-commercial stages of advanced technologies to produce energy from nuclear processes with minimal waste from the fuel cycle (section 4.26 added by the Complementary Delegated Act) and electricity generation from nuclear energy in existing installations (section 4.28 added by the Complementary Delegated Act). In this context, NewCo will contribute to extending the lifetime of existing nuclear power plants and the PALLAS reactor will provide facilities to support R&D&I on the development of innovative and sustainable next generation nuclear power plants such as small modular reactors (SMRs).

5.1.5. Limiting transport of nuclear materials throughout the EU

(95) A major constraint in the supply chain of medical isotopes is the radioactive decay of the isotopes. Logistical efficiency and just-in-time delivery are essential for the economic sustainability of the global supply chain. The Energy & Health Campus in Petten, the location of the current HFR and of the future PALLAS

([92]) NucAdvisor 2021, p. 136.

([93]) Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities, OJ L 188, 15.7.2022, p. 1-45.

([94]) Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020, p. 13-43.

reactor, is a unique site in Europe where both irradiation facilities (HFR/PALLAS reactor) and processing facilities for diagnostic medical isotopes (the Molybdenum Processing Facility ([95])) are situated. With the Nuclear Health Centre (NHC), in the same site there will also be processing facilities for therapeutic isotopes ([96]). Such a "combined approach", whereby irradiation and processing facilities are located in the same site, makes sure that transport of radioactive material across Europe can be minimised and optimised, which has a public value in terms of safety and security for EU citizens.

(96) The Dutch Authorities point out that the above "combined approach" is common practice, as governments around the world finance the construction and/or the operation in one site of both irradiation and processing facilities. For example, the Belgian government financially supports the development of the Centralized Radiochemical Facility. According to the Dutch Authorities, the fact that almost all these "combined approach" projects are fully publicly owned and/or subsidised by governments, is an indicator of market failure.

(97) As mentioned above (see recital (62)), the complainant alleges that there is no market failure justifying State aid for a processing facility like the NHC, because such a facility (as opposed to a reactor) can be built by private investors without major technical and financial difficulties. In this regard, the Dutch Authorities point out that, while "dedicated" processing facilities – i.e. processing facilities developed by pharmaceutical companies exclusively for their specific medical isotopes which have already passed all relevant testing and registration requirements – may indeed be attractive for private investors, the NHC will not be such a dedicated facility. In fact, the NHC will be a generic (non-specific) facility (matching the generic PALLAS reactor), whose specifications allow the processing of a variety of isotopes that are known or expected to have medical applications.

(98) Finally, the Dutch Authorities point out that the inclusion of the NHC in the PALLAS project makes sense from a financial viewpoint, because the revenues of the NHC will shorten by two years the payback period of the public loans granted to NewCo. In fact, if the NHC (both the income generated by it and the planned CapEx and related financing) were excluded from the project, a full repayment of the loans is expected in 2051, instead of 2049.

(99) Therefore, the Dutch Authorities consider that, contrary to the complainant's opinion (recital (62)), there is a need to support the PALLAS project as a whole comprising both the PALLAS reactor and the NHC.

([95]) The Molybdenum Processing Facility (MPF) is owned by the NRG and operated by Curium, the world's largest nuclear medicine company. Curium, as a separate legal entity with its own governance structure related to its private equity ownership, is completely independent from the HFR. In the MPF at Petten, Curium processes not only Uranium targets irradiated in the HFR, but also Uranium targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland.

([96]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

5.1.6. Promoting nuclear non-proliferation

(100) This objective relates to the Non-Proliferation Treaty and the Additional Protocol ([97]) in which all EU Member States have committed to nuclear non-proliferation. In the past, the production of medical radioisotopes required the use of Highly Enriched Uranium (HEU), that can be used in nuclear weapons. For security reasons, the EU has committed to convert radioisotopes processing facilities to use Low Enriched Uranium (LEU), which cannot be used in nuclear weapons. At the 2012 Nuclear Security Summit in Seoul, the Netherlands, Belgium, France and the United States issued a joint statement in which they reaffirmed their commitment "*to minimize the use of Highly Enriched Uranium (HEU) for civilian purposes, where technically and economically feasible, in order to advance the goal of nuclear security, as stated in the Washington Final Communiqué and Work Plan […]. In the longer term [after 2015], the use of HEU will be completely eliminated for medical isotopes that are produced in Belgium, France and the Netherlands and used in those countries and in the United States*". In the meantime, this objective has been completely reached in the Netherlands: the HFR has been using LEU fuel since 2006; both the HFR and the Molybdenum Processing Facility completed the conversion to LEU targets in 2021. The final step is to have the PALLAS reactor designed and operational on LEU fuel and targets, thereby delivering a substantial contribution to European and global non-proliferation objectives.

(101) Based on the considerations in sections 5.1.1. to 5.1.6. above (recitals (75) to (100)), the Dutch Authorities hold that the notified aid measures pursue well defined objectives of common interest. As regards the opinion of June 2023 whereby the Dutch National Growth Fund advised the Dutch Government not to use that Fund's budget to finance the PALLAS project, the Dutch Authorities stress firstly that the Fund explicitly acknowledges the strategic and social importance of the PALLAS project for the Netherlands and the EU, and secondly that the Fund's statement that the PALLAS project lacks "earning capacity" is a reference to the objectives pursued by the Fund, which cannot in any case be understood as a criticism of the business case on which the Dutch Government has based the PALLAS project ([98]). Therefore, contrary to what is suggested by the complainant (recital (63)), this opinion by the Dutch National Growth Fund cannot be considered as evidence that the PALLAS project does not contribute to an objective of common interest.

([97]) See Treaty on the Non-Proliferation of Nuclear Weapons (NPT) | IAEA.

([98]) The opinion issued by the Dutch National Growth Fund in June 2023 can be found here: Adviesrapport derde beoordelingsronde commissie Nationaal Groeifonds | Rapport | Nationaal Groeifonds. The PALLAS project is discussed on pages 30 and 151 to 154. In particular, on page 152 the Funds states the following: "*De commissie adviseert het kabinet om geen middelen toe te kennen aan dit project vanuit het Nationaal Groeifonds. De commissie vindt de PALLAS-reactor zeer belangrijk voor Nederland en de EU vanuit strategisch en maatschappelijk perspectief, maar is niet overtuigd van de bijdrage aan het duurzame verdienvermogen van Nederland.*" ("The committee advises the government not to allocate resources to this project from the National Growth Fund. The committee considers the PALLAS reactor very important for the Netherlands and the EU from a strategic and social perspective, but is not convinced of its contribution to the sustainable earning capacity of the Netherlands.").

5.2. Proportionality

(102) The Dutch Government points out that it has taken measures to ensure that the aid amount is limited to the minimum needed to achieve the identified objectives.

(103) In particular, the Dutch Authorities have provided a detailed business plan, showing that the PALLAS project is expected to be fully operational by 2033.

(104) The project entails total investment costs (CapEx) for EUR [2-3] billion over the expected lifespan of the project running until 2070. CapEx mainly relate to the PALLAS reactor, as the largest (future) asset of NewCo, but also include investments for the NHC and incremental capitalised investments in ancillary assets on the Petten site that are used (or remain to be used) in the operations of NewCo after the Commercial Operating Date (COD) of the PALLAS reactor.

(105) The length of the business plan period is 52 years, from 2019 until 2070. This includes 5 years and a half of preparation phase (until the date of incorporation of NewCo set in the Financial Model on 1 July 2024 ([99])), 6 and a half years of construction phase, 2 years of transition in which the production will be shifted to the PALLAS reactor, and 38 years, from 2033 onwards, in which NewCo will be generating revenues from the PALLAS reactor and NHC.

(106) The Dutch Authorities explained that the counterfactual scenario consists in the absence of any alternative project by NewCo. Therefore, the funding gap has been determined exclusively on the basis of the factual scenario.

(107) The Dutch Government points out that it has taken measures to ensure that the aid amount is limited to the minimum needed to achieve the identified objectives.

(108) A combination of financial sources will be used to finance the project:

(a) The loans (amounting to maximum EUR 469.7 million) provided since 2019 and to be provided until the incorporation of NewCo at which point the Dutch Government is envisaged to become the sole shareholder of the company. This funding is provided under the same terms and for the same purpose as the loans authorised by the 2013 Decision i.e., to implement Phase 1 of the PALLAS project.

(b) The debt financing (amounting to EUR [400-800] million) and equity financing (amounting to EUR [800-1 100] million) to be provided after the incorporation of NewCo, which financing is covered by both an Equity Contribution Agreement and a Credit Agreement to be entered into between the Dutch Government and NewCo. The equity part is currently assumed in the Financial Model to account for [40-80]% of the total planned public funding after the incorporation of NewCo and the long-term debt for the remaining [20-60]%, both in line with the Draft Equity Contribution Agreement and the Draft Credit Agreement. The allocation to

([99]) While the 26 June 2024 notification indicated that the planned date for the aid to be granted was 1 July 2024, on 28 June 2024 the Dutch Authorities clarified that no aid will be granted prior to the date of adoption of the Commission decision.

equity and long-term debt as set out above has been carefully considered, taking into account the debt (service) capacity of NewCo in the long run. When allocating [20-60]% to long-term debt, it is expected that NewCo will be able to comply with its debt service obligations as well as reach market standard financing ratio's (e.g. leverage-ratio and debt service coverage ratio (DSCR)) within a reasonable number of years following the COD of the PALLAS reactor.

(109) NewCo plans to repay the public funding by using the proceeds of its medical isotope production activities. NewCo plans to reimburse the debt and remunerate the equity financing through interests, progressive loan reimbursements and dividends over the lifetime of the project.

(110) Finally, the Dutch Government points out that the notified measures may not be cumulated with other aid to cover the same eligible costs.

(111) The business plan provided by the Dutch Authorities sets out the forecast revenues and costs of the project.

Revenues

(112) According to the Dutch Authorities, the revenues from the project will stem from the activities of NewCo which can be grouped into three main categories:

(a) Medical radioisotopes: this includes Mo-99 (unprocessed), therapeutic isotopes and revenues generated by the processing activities (e.g. with the NHC);

(b) Industrial isotopes ([100]); and

(c) Research and other services, which include the consultancy & services business (C&S) and MPF services. C&S concerns monitoring and quality testing services, safety analyses, licensing support, consultancy on waste and decommissioning, and various services to continue safe operations; the MPF is the Molybdenum Production Facility which is used and operated by Curium for extracting Mo-99 from irradiated targets.

(113) Based on the revenue projections provided by the Dutch Authorities in the base case model of NewCo, the following percentages result (on average) for 2033 – 2035:

- [50-80]% of total revenues from medical radioisotopes: this includes Mo-99 (unprocessed), therapeutic isotopes and revenues generated by the NHC. Therapeutic isotopes are the most important revenue driver, generating circa [30-60]% of revenues on average in the period 2033-2070;

- [1-5]% of total revenues from industrial isotopes; and

([100]) Industrial isotopes are used by manufacturers as tracers to monitor fluid flow and filtration, detect leaks, and gauge engine corrosion of process equipment.

- [15-30]% of total revenues from research and other services (including C&S and MPF services), where the research activities represent [1-5]% of the total revenues (on average) for 2033 – 2070.

(114) The Dutch Authorities have indicated that revenues are expected to grow over the lifetime of the project, among other things driven by assumed price indexations in line with inflation. Table 1 provides an overview of the base case revenue projections for 2033–2050 in EUR million.

Table 1: Evolution of base case revenue projections in EUR million

[…]

Source: Information provided by the Dutch Authorities in the Notification

Costs

(115) As described in recital (104), the CapEx of the PALLAS project amount to EUR [2-3] billion over the expected lifespan of the project running until 2070.

(116) The Dutch Authorities have indicated that, on top of the CapEx, the business plan also reports the other operating costs of the Project, which encompass the operating expenses relating to the operations of the PALLAS reactor and the NHC (including personnel, fuel costs, maintenance, overhead etc.).

(117) According to the Dutch Authorities, personnel costs are a key driver of costs. Other operating expenses include waste, utility and transport costs, maintenance expenses and overhead costs, among others. For the NHC the other operating expenses also include the internal cost price of irradiated targets supplied by the PALLAS reactor for processing in the NHC. All operating expenses are subject to indexations in line with inflation.

(118) The Dutch Authorities have indicated that depreciation expenses mainly relate to the PALLAS reactor, as the largest (future) asset of NewCo, but also include depreciation of the NHC and of incremental capitalised investments in ancillary assets on the Petten site that are used (or remain to be used) in the operations of NewCo after the COD of the PALLAS reactor.

(119) Finally, the Dutch Authorities have indicated that provisions include provisions for the future decommissioning of the PALLAS reactor (foreseen after 2070) and the (indexation effect on) provisions for the future decommissioning of other nuclear contaminated buildings (foreseen in 2040-2045).

Funding gap of the project

(120) The Dutch Authorities have provided the business plan and calculations for the funding of the PALLAS project, i.e., the net present value ('NPV') of the project's cash flows, net of State support. The funding gap analysis is based on a business plan which encompasses Phase 1 – Design, tendering, permitting, financing; Phase 2 – Construction; and Phase 3 – Operation – of the PALLAS project. The Dutch Authorities have indicated that the business plan only contains the incremental cash flows related to the PALLAS project and does not contain

any cash flows relating to the HFR in the transition period to the PALLAS reactor nor any cash flows related to the decommissioning of the HFR.

(121) The funding gap has been estimated by the Dutch Authorities using the Weighted Average Cost of Capital ('WACC') as discount factor. Based on the latest available information as of June 2024, the WACC is estimated by the Dutch Authorities at [10-20]%.

(122) As concerns the cost of equity, the risk-free rate of 2.5% has been estimated by the Dutch Authorities as the yield of 30-year German government bonds as of 15 June 2024, derived from Capital IQ. The market risk premium (MRP) of 5% has been derived from the 2024 MRP study of KPMG The Netherlands ([101]). The unlevered beta of [0.5-2.5] has been calculated based on a peer group of listed companies in the construction business using data from Capital IQ.

(123) Table 2 summarises the components of the cost of equity. The Dutch Authorities explain that the resulting [5-15]% cost of equity does not yet include the additional risk premia estimated at [1-10]%.

Table 2: Breakdown of cost of equity's components

PALLAS CoE - WACCs	
As at 15 June 2024	
Unlevered beta	[0.5-2.5]
Equity w eight	[40-80] %
Debt w eight	[20-60] %
D/E	[30-70] %
Levered beta	[0-2]
Market risk premium	5.0%
Risk-free rate	2.5%
Corporate risk premium	[5-10]%
Cost of equity	**[5-15] %**

Source: Information provided by the Dutch Authorities in the Notification

(124) Additional risk premia have been estimated by the Dutch Authorities at [1-10]%, based upon a size premium of [1-5]%, as estimated by Kroll (2023), and an additional risk premium of [1-5]% for specific risks related to nuclear construction projects. The size premium is justified based on specific characteristics of the project, such as its reliance on a single asset (i.e. the PALLAS reactor), its concentration of revenue sources in only two markets (diagnostic isotopes and therapeutic isotopes) and its operation with a limited number of key clients, particularly in the Mo-99 business. The additional risk premium is justified with reference to the significant uncertainties in the project, for example uncertainties related to offtake in the therapeutic isotopes market.

(125) Based on the above, the total cost of equity has been calculated by the Dutch Authorities at [10-25]%.

([101]) Equity Market Risk Premium – Research Summary.

(126) As concerns the cost of debt, the post-tax cost of debt has been calculated at [1-10]% based on the 1-month EURIBOR estimated at 3.579% by Bloomberg as per 15 June 2024, an interest margin of [400-800] bps, which corresponds to a […] rating with […] level of security or a […]rating with […] level of security, and the Dutch corporate income tax rate of 25.80%.

(127) According to the Dutch Authorities, the resulting NPV of the project amounts to EUR [-1 - -2] billion, meaning that absent state aid support, the project would not be viable as its NPV, based on the WACC, is negative.

(128) To calculate the aid amount and ensure this is limited to the minimum needed to achieve the common objectives pursued, the Dutch Authorities explain that the gross grant equivalent on both government debt and government equity is calculated as the NPV of the delta in equity returns resulting from the business case (i.e. the IRR) and the delta in interest charges when applying the actual returns included in the business case for the PALLAS project versus a scenario where the assumed market parameters are applied.

(a) Gross grant equivalent (or aid element) on equity: The gross grant equivalent on equity amounts to EUR [500-800] million. This is calculated by the Dutch Authorities as the NPV of all equity cash flows (i.e. disbursements by the Dutch Authorities to NewCo and dividends paid to the Dutch Authorities by NewCo), using as a discount rate the Cost of Equity (of [10-25]%). The resulting value indicates the 'shortfall' in equity returns to reach the required return (i.e. Cost of Equity), i.e. the delta in the IRR of equity cash flows that the Dutch Government is willing to accept versus what is assumed an average market participant (private investor) would require.

(b) Gross Grant Equivalent on Senior Debt: The Gross Grant Equivalent or aid element on Senior Debt equals EUR [100-400] million. As set out above, this is calculated by the Dutch Authorities based on the difference in the interest costs between Q3 2024 and the full redemption of the government loans (end of 2049) by applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs that result based on the interest rates from the Draft Credit Agreement. The interest costs in both scenarios are based on the loan balance resulting from the incremental business case including the expected disbursements, interest accruals, mandatory repayments and accelerated repayments based on a cash sweep. The resulting difference in interest costs is discounted using the WACC of [5-20]%. According to the Dutch Authorities, the underlying assumption for using the WACC as the discount rate is that the lower interest rate in the Senior debt instrument provided by the State will lead to an advantage for NewCo which the company should then invest with the aim to yield a return in line with the overall required return for the business (i.e. the WACC).

(c) Gross Grant Equivalent on Old Debt: The Gross Grant Equivalent or aid element on Old Debt equals EUR [200-500] million. The approach to the Gross Grant Equivalent on Old Debt is similar to the approach for Senior Debt, with two key differences: the Gross Grant Equivalent on Old Debt is assessed from Q3 2019 onwards (i.e. first quarter where a loan that is part

of this notification is disbursed); and the (difference in) interest costs prior to 1 July 2024 are carried forward (i.e. interest is compounded using the WACC) to 1 July 2024, while the difference in interest after 1 July 2024 is discounted using the WACC, in line with approach for the Senior Debt.

(129) According to the Dutch Authorities, the resulting Gross Grant Equivalent amounts to EUR[800 1 700 million], as shown in Table 3 under column "Base case WACC". This implies that the funding gap is EUR [50-400] million higher than the total Gross Grant Equivalent. From the perspective of the Dutch Authorities, this means that the aid to the PALLAS project is proportionate.

(130) Table 3 also includes a sensitivity analysis provided by the Dutch Authorities in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium (ARP) of [1-5]% (under column "WACC excl. ARP"). According to the Dutch Authorities, it results from the WACC sensitivity that the aid can still be found proportionate.

Table 3: Summary of the proportionality analysis, with sensitivity on the WACC

NPV gap analysis

WACC assumptions	**WACC excl. ARP**	**Base case WACC**
Cost of Equity	[10-25]%	[10-25]%
E/(D+E)	[40-80]%	[40-80]%
Cost of Debt (after tax)	[1-10]%	[1-10]%
D/(D+E)	[20-60]%	[20-60]%
WACC	[5-20]%	[5-20]%
EURk		
Aid element - Equity	[500 000-800 000]	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**	**[800 000-1 700 000]**
funding gap	([1 000 000-2 000 000])	([1 000 000-2 000 000])
NPV gap	**([50 000-400 000])**	**([50 000-400 000])**

Source: Information provided by the Dutch Authorities in the Notification

5.3. No undue distortion of competition and trade

(131) The Dutch Authorities consider that the notified aid measures will not unduly distort competition and trade in the European Union, for the following reasons:

1) The market of medical isotopes is already atypical and distorted, as the existing reactors have been realised with public funding. New initiatives too are generally developed with public support, as shown by many ongoing projects for research reactors (see recital (86)) or for nuclear

power plants ([102]). This is due to the fact that nuclear (research) reactors typically combine long term investment risks with only limited revenue certainty ([103]). The market consultation about nuclear power plants published by KPMG in July 2021 ([104]) concludes that government involvement is inevitable for such large-scale projects. That market consultation also confirms that private investors are not willing to take first-of-a-kind risks such as the ones relating to the PALLAS reactor.

2) At present, the HFR operated by NRG serves approximately 30% of the world market for the main diagnostic isotope Mo-99, and approximately 70% of the European market. The Dutch Authorities consider that NewCo's market share will not be larger than the current market share of NRG, given the forecasted increase in global demand. A 2022 report made for the Dutch Government by KPMG concludes that, given the forecasted increase in global demand and the anticipated Mo-99 production capacity of the PALLAS reactor, NewCo's market share will not be larger than the current market share of NRG. As regards therapeutic isotopes (such as Lu-177), the abovementioned 2022 report reaches a similar conclusion: once the PALLAS reactor starts operations, NewCo's share in the world market for therapeutic isotopes will not be bigger than the share of NRG in the same world market (estimated at 13% for 2023). In this regard, the Dutch Authorities explain that, although the PALLAS reactor's theoretical maximum production capacity ([200 000 – 500 000] 6-day Ci per year) will be higher than that of the HFR (241 800 6-day Ci per year), the business case scenarios show an actual market share of NewCo (with the PALLAS reactor) that will not significantly grow compared to NRG's (with the HFR) and will probably be slightly smaller. This is due to the fact that the market for medical isotopes is characterised by growing demand, especially for therapeutic isotopes, in Europe and globally ([105]). Also in the transitional period, expected to last two years, during which

([102]) Examples of new nuclear power plant projects supported by governments include: Hinkley Point C, for which the UK government has entered into a contract covering the difference between a set strike price and actual prices (https://www.gov.uk/government/collections/hinkley-point-c, 2016); Paks II, for which the Hungarian government has provided a 100% guarantee (https://ec.europa.eu/commission/presscorner/detail/en/IP_17_464); Voglte in the US, funded by government-related energy companies and supported with a loan guarantee of the US Department of Energy (https://www.reuters.com/article/us-usa-nuclearpower-vogtle-idUSKCN1R31X9, 2019); Elektrárna Dukovany II in the Czech Republic, where a two-way contract for difference (with price support for 40 years) is applied (https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2366).

([103]) This is also confirmed in the Commission's State aid decision on Hinkley Point C, where a long construction and operating time, and hence a long payback period (of more than 30 years), is mentioned (Commission Decision of 08.10.2014 on the aid measure SA.34947 (2013/C) (ex 2013/N) which the United Kingdom is planning to implement for support to the Hinkley Point C Nuclear Power Station, recital 89).

([104]) This consultation, which was commissioned by the Dutch Government, is available at Marktconsultatie kernenergie | Rapport | Rijksoverheid.nl (original Dutch version) and at Market consultation nuclear energy | Report | Government.nl (English translation).

([105]) According to the Netherlands, experts expect a market growth for the main diagnostic isotope Mo99 of 3-5% per year in the period 2020-2030, and a market growth for therapeutic isotopes of 33% (2019-2025) and 25% (2025-2030). Therefore, despite the maximum capacity of the PALLAS reactor being larger than the current capacity of the HFR, the overall market demand will also increase and hence a larger capacity does not automatically lead to an increase in market share.

the HFR and the PALLAS reactor will be both in operation, NewCo's market share will not be larger than the current market share of NRG: in fact, during this period a stepwise ramp-up of the production of the PALLAS reactor will be accompanied by a parallel stepwise scale-down of the production of the HFR, so that overall there will be no major increase in revenues.

3) The Dutch Government aims to operate as a market investor in the sense that NewCo shall repay the public funding and shall implement the full cost recovery (FCR) principle. Historic and current prices of medical radioisotopes are insufficient to provide for an economically sustainable business environment. Implementation of the FCR principle is one of the key objectives of the OECD-NEA, according to which recovering the full cost of production in the pricing for irradiation services is crucial to ensuring economic sustainability and a long-term security of supply ([106]). The implementation by NewCo of the FCR principle will lead to more mature market conditions worldwide. Furthermore, NewCo will charge a reasonable margin for the medical isotopes it will produce on a commercial basis.

4) The Dutch Government points out that NewCo will allocate costs in such a way as to avoid any cross-subsidisation between the funding received for R&D&I activities and the production of medical isotopes. In the case of effective collaborations within the meaning of paragraph 16(h) of the EU Framework for State aid for research and development and innovation (the "R&D&I Framework") ([107]), NewCo will comply with section 2.2.2. ("Collaboration with undertakings") of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration. These measures will further diminish potential distortions of competition and trade between the Member States.

5) The Dutch Government points out that, given the complexity of the production process of medical isotopes and their limited shelf life, for any purchaser of medical isotopes it is absolutely necessary to have multiple suppliers, because of down-time of production facilities (this is the case for both reactors and the newly proposed technologies) and because no one supplier can completely meet (European and global) demand. The presence of multiple producers in the market will also lead to pharmaceutical companies being more incentivised to invest in new therapies using medical isotopes. Therefore, the Dutch Government also welcomes initiatives such as SHINE to ensure global supply of medical isotopes and has provided SHINE with assistance through among other

([106]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012, p. 7.

([107]) Communication from the Commission "Framework for State aid for research and development and innovation" 2022/C 414/01 (C/2022/7388), OJ C 414, 28.10.2022, p. 1-38.

things subsidies and loans ([108]). In this regard, the Dutch Authorities also point out that SHINE's statement, according to which the Dutch Government's support in favour of PALLAS is having a chilling effect on SHINE's investors at a critical time for the construction and scaling of SHINE's production facilities in the USA and in Veendam (the Netherlands), is contradicted by the fact that SHINE's decision to construct and scale its production in Veendam was taken in May 2021 ([109]), i.e. after the Dutch Government had already publicly announced its intent to support the PALLAS project in a letter to the Dutch Parliament in December 2020 ([110]). Furthermore, the Dutch Authorities point out that, according to publicly available information, by late 2023 SHINE had raised from investors a total of $ 742.2 million ([111]), including a $ 70 million round in October 2023 in which both existing investors and new institutional investors participated ([112]). In November 2023, SHINE also announced a long-term supply agreement with Nucleus RadioPharma, the world's first fully integrated development, manufacturing and supply organisation for radiopharmaceuticals ([113]). This, according to the Dutch Authorities, indicates that SHINE is one of the industry's most promising and rapidly expanding businesses, which continues to attract private investments.

(132) As concerns the implementation by NewCo of the FCR principle, mentioned under point 3) of recital (131), the Dutch Government stresses the following:

a) The Netherlands is one of the signatories of the 2014 Joint Declaration supporting the implementation of the FCR principle and of the other OECD recommendations ([114]). The international implementation of the FCR principle is also designated as a core task for NRG|PALLAS in the 2018 decision allocating responsibility for the PALLAS project to the Ministry of Health, Welfare and Sport ([115]). Consequently, NRG|PALLAS has proposed to the Dutch Government a business case for the PALLAS project which

([108]) The Dutch Authorities have provided various loans and subsidies to SHINE and are in the process of providing further assistance: 1) the Ministry of Health, Welfare and Sports provided a EUR 10 million loan, paid in two tranches in 2021 and 2022; 2) the Investment and Development Company for the North of the Netherlands provided a subordinated loan of EUR 1 million; 3) the Province of Groningen provided a subordinated loan of EUR 4 million and a subsidy of EUR 5 million. In addition, the Ministry of Health, Welfare and Sports is considering to grant to SHINE EUR 8 million under the IPCEI Health "Med4Cure" approved by the European Commission on 28 May 2024 (https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2852).

([109]) SHINE Technologies | SHINE selects Netherlands for European isotope production facility (shinefusion.com).

([110]) Kamerbrief over stand van zaken Pallas-reactor | Kamerstuk | Rijksoverheid.nl.

([111]) https://www.crunchbase.com/organization/shine-medical-technologies/company_financials.

([112]) SHINE Technologies | SHINE Technologies Raises $70 Million Financing Round to Accelerate the Commercialization of Near-Term Applications of Fusion Technology (shinefusion.com).

([113]) https://www.businesswire.com/news/home/20231116001648/en/SHINE-Technologies-and-Nucleus-RadioPharma-Partner-to-Advance-Radioligand-Cancer-Treatments.

([114]) NEA press release - Joint Declaration on the Security of Supply of Medical Radioisotopes (oecd-nea.org).

([115]) stcrt-2019-1202.pdf (officielebekendmakingen.nl).

internalises the FCR principle: indeed, this business case foresees full coverage of the costs to be incurred, as well as full payback of the public financing (to be) provided for the PALLAS project.

b) Despite the efforts made by the OECD-NEA High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR), there is still no international consensus on the various cost components to be covered by FCR ([116]). Nevertheless, the business case for the PALLAS project foresees a far-reaching FCR model whereby the prices charged by NewCo for the PALLAS products and services will reflect in particular the following costs: preparation phase ahead of the construction of the reactor, licensing, regulatory changes, insurances and taxes, location and ground costs, all regular operational expenses (personnel, fuel, maintenance, overhead, utilities, etc.), refurbishments, financing, depreciation, security, radioactive waste management (both short-term and long-term storage of radioactive waste), decommissioning of the reactor and of nuclear-contaminated buildings ([117]). This is a far-reaching FCR model in that it covers costs that are often not reflected in the prices charged by other reactors for their medical isotopes ([118]), meaning that the prices for the PALLAS isotopes will likely be higher than average market prices. In any case, a comparison of the above-listed costs (covered by the PALLAS FCR model) with the cost items mentioned by the complainant as necessary elements of a genuine FCR pricing (recital (61)) shows that the latter are covered by the PALLAS FCR model.

c) Another FCR-related issue on which there is still no international consensus is how to allocate costs to individual products and services ([119]). Indeed, it is difficult to develop a consistent, verifiable and auditable model for such a cost allocation: the majority of the cost components are not driven by the specific products and services, and do not scale with the volume of these products and

([116]) The countries involved in the OECD-NEA HLG-MR discussions have produced self-assessments about FCR. From these self-assessments it is clear that the countries still have different opinions regarding the cost components to be covered by FCR. These self-assessments are included in the following reports: 2014 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Results from the Second Self-assessment of the Global 99Mo/99mTc Supply Chain (oecd-nea.org); 2017 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Results from the Third Self-assessment of the Global Mo-99/Tc-99m Supply Chain (oecd-nea.org); 2019 report Nuclear Energy Agency (NEA) - The Supply of Medical Radioisotopes: Final Report of the Fourth Mandate of the High-level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) (oecd-nea.org).

([117]) In particular, as explained in the Netherlands' submission of 28 August 2023, "*Depreciation on CAPEX related to the construction of the PALLAS-reactor and NHC (as far as construction costs are capitalised) as well as CAPEX investments related to periodic maintenance and required refurbishments during the life time of the PALLAS-reactor and NHC are part of the business case as well*".

([118]) An example of this is decommissioning. Depending on the country where the reactor is located, the responsibility for decommissioning costs is subject to different national regimes, ranging from full responsibility of the government to full responsibility of the reactor operator. As mentioned above, according to the FCR model adopted for the PALLAS project, decommissioning costs will be borne by NewCo and reflected in the prices of the products and services provided by PALLAS. Another such example is the costs for the radioactive waste management.

([119]) The absence of an international consensus on how to allocate costs to individual products and services, is shown by the OECD-NEA HLG-MR reports mentioned in footnote 116.

services, but they are common costs of the infrastructure relating to e.g. fuel, cooling, staff, financing, decommissioning, etc. Many countries participating in the OECD-NEA HLG-MR have therefore confirmed that such common costs of the infrastructure – if at all reflected in the prices – are typically allocated on the base of the turnover related to the products and services, and not on the base of the amount or volume of the products and services: for example, if 60% of the turnover comes from public subsidies and 40% from unsubsidised activities, reactor operators tend to allocate 60% of all the costs to publicly subsidised products/services and 40% to unsubsidised products/services. This means that, in the common market practice, FCR is implemented at the company level, not at the level of individual products and services ([120]). In addition, allocating costs to specific irradiation positions is made problematic by the variety of the possible utilisation scenarios over time, the difficulty in counting neutrons and the interference between various positions within the core of the reactor. This is why the FCR model applied by the Dutch Government to the PALLAS project follows the common market practice described above, thereby making it the responsibility of NewCo's board of directors to guarantee cost coverage over the whole portfolio of products and services that the company will provide.

d) Since the Dutch Government does not plan to finance the operation of NewCo after the PALLAS reactor has started commercial production, the implementation by NewCo of the FCR principle means that the company will need to recover the relatively high costs associated with its operations, including the ones relating to the PALLAS reactor, as detailed under point b) above. Even so, the expected internal rate of return matches the Dutch Government's requirements. As a result, from a business perspective there will be no incentives for NewCo to price its products and services below FCR or LCUM.

e) The Dutch Government, as a shareholder of NewCo, will act in a similar fashion as with its other State holdings. In all these similar situations, the Dutch Government requires the companies in which it is the sole or majority shareholder to achieve a reasonable sector-specific rate of return ([121]). This approach will also ensure that any agreements reached by NewCo with suppliers and clients will occur at arm's length, rather than with public policy objectives in mind. Another reason why policy objectives cannot determine price is that, under the Law on Market and Government, the Dutch Government, when operating a State-owned business, is required to charge at least the integral cost for any goods or services it provides ([122]). This law is

([120]) The Dutch Authorities point out that, to their knowledge, there is no publicly available report or study confirming that the common market practice in the medical isotopes sector consists in applying FCR at the company level, and not at the level of individual products and services. Nevertheless, the Dutch Authorities conclude that applying FCR at the company level is the common market practice, because most irradiators require governmental support to remain financially viable at "company" level and because the reactors currently applying FCR do so on the basis of a limited FCR model. The Dutch Authorities state that this is the only information available on the application of FCR, and that no examples exist for the application of FCR at product level.

([121]) See for further information the Dutch Ministry of Finance's 2022 report on State-owned enterprises, for example section 5.7 (Bijlage 1 - Nieuwe nota Deelnemingenbeleid 2022 (overheid.nl)).

([122]) Law on Market and Government (https://zoek.officielebekendmakingen.nl/stb-2011-162.html).

independently enforced by the Netherlands Authority for Consumers and Markets (ACM), which is empowered to investigate any violation thereof either on its own initiative or following a complaint. Should it find that the integral cost price is not applied to a good or service, the ACM has the power to impose fines until the State-owned enterprise complies. As a result, NewCo will not price below FCR levels due to public policy objectives.

f) To monitor the compliance by NewCo with the FCR principle as of the commercial operating date of the PALLAS reactor, the Dutch Government will appoint a Monitoring Trustee. The Trustee, who will be independent and will not receive instructions from the Dutch Government, will act in compliance with the Trustee Mandate submitted by the Dutch Authorities (Attachment 1 to the present Decision).

(133) Regarding the Trustee Mandate (mentioned in point f) of recital (132)), its provisions and the Commitments taken therein by the Dutch Authorities can be broadly summarised as follows:

A. With the approval of the Commission, the Dutch Authorities shall appoint, following a competitive selection procedure, an independent Monitoring Trustee. The Trustee shall only receive instructions from the Commission.

B. The Trustee shall monitor the compliance of NewCo with the Commitments under the Mandate and the present Decision, according to a work plan approved by the Dutch Authorities and the Commission. The Trustee shall report to the Dutch Authorities and the Commission in the ways foreseen by the Mandate.

C. The Trustee shall in particular monitor and verify the effective coverage, by NewCo as a corporation (i.e. not at product level), of all the costs associated with the PALLAS programme ([123]) by the revenues generated from the commercialisation of the various isotopes in the various market segments where NewCo is active (the "Full Cost Coverage Commitment"). The costs in question, and the information to be provided to the Trustee in order to enable the Trustee to monitor and verify, are defined in the Mandate. In case the monitoring and verification are insufficient to ensure compliance with the Full Cost Coverage Commitment, the Trustee may verify whether NewCo is generally not acting as a price leader on the market segments (the "No Lowest Price Leader Commitment").

D. In case the Commitments are not properly implemented and/or complied with, the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedies and notifying them to the Commission for a new approval:

([123]) The Mandate defines the PALLAS programme as follows: "the production of isotopes at the PALLAS-reactor, the marketing and sale of those isotopes to commercial clients, the activities of the Nuclear Health Centre". This definition of the PALLAS programme in the Mandate is different from the one given in recital 3 of the present Decision. This difference simply reflects the fact that the Mandate obviously concerns the activities of the new PALLAS facilities (the reactor and the NHC) once they have been built and have started operations.

1. […].

2. […]:

   i. […].

   ii. […].

[…].

Upon approval by the Commission, the Remedies shall be implemented by the Dutch State. The Trustee shall monitor the execution of the Remedies.

(134) Based on the Trustee Mandate and the Commitments taken therein by the Dutch Authorities, the latter consider that the complainant's doubts about the actual implementation by NewCo of the FCR principle (recital (61)) are unfounded. In addition, the Dutch Authorities consider that the complainant will not operate its own business in compliance with the FCR principle, since the complainant has received from the US Authorities assistance to lower its total costs in the form of both subsidies ([124]) and lease and take-back agreements for its raw materials ([125]). The Dutch Authorities refer in particular to a presentation made by SHINE in August 2023, showing that SHINE is heavily dependent on support from the US Government ([126]). According to the Dutch Authorities, the presentation makes clear that SHINE relied first on funding from the US Department of Defense (in 2009), and that the technical development is now in large part covered by a cooperative agreement with the US National Nuclear Security Administration, a subsidy programme that is run by the US Department of Energy. The presentation explains that development funding provided by the US Department of Energy matches 50% of the funding.

(135) Concerning the costs covered by the PALLAS FCR model, mentioned under point b) of recital (132), the Dutch Government points out that the Dutch GAAP accounting rules (RJ 210.224, sub e) prevent NewCo to capitalise costs related to the PALLAS project until a point in time where there is sufficient certainty that the PALLAS reactor will become operational. An important element in this regard is the financing of the PALLAS project, which needs to be approved by the European Commission. When such approval will have been obtained, NewCo incorporated and the Equity Contribution Agreement and Credit Agreement executed, it is assumed that going forward CapPEx can be capitalised to a large extent (approximately 90%). At that point in time, part of the CapEx (10%) will still be considered to be more general expenses that will also, going forward, be expensed. This is supported by the OECD guidelines on full cost recovery: "*Operators have the responsibility to adhere to the principle of full-cost recovery and to ensure it is implemented,* ***respecting applicable domestic accounting law***

([124]) NNSA awards $35 million to promote U.S. production of critical medical isotope | Department of Energy.

([125]) DOE offices and SHINE sign first-ever contracts under Uranium Lease and Take-back Program to produce domestic Mo-99 | Department of Energy.

([126]) https://arpa-e.energy.gov/sites/default/files/Driven%20Subcritical%20Systems%20SHINEs%20Experience%20and%20Lessons%20Learned.pdf.

and competition rules. *It should be recognised that there may be differences in how such analyses are performed to align with accounting standards and financial reporting.*" (emphasis added) ([127]) In this regard, the Dutch Government indicates that the historical expensed CapEx should be part of the FCR calculations. All CapEx that are capitalised, i.e. from the date of incorporation of NewCo onwards, are included in the FCR calculations via the annual depreciation post-COD. For the non-capitalised (i.e. expensed) CapEx, a pro forma depreciation charge will be included in the FCR calculations. The Dutch Authorities explain that the same holds for interest costs pre-COD, which are pro forma capitalised and depreciated (applying a 40-year depreciation period in line with the overall depreciation of the capitalised costs for the PALLAS project). Finally, given that dividend payments are only expected once the government loans are fully repaid (i.e. after 2049), a proxy for the cost of equity is included in the FCR model of NewCo based on the cumulative equity investment and the IRR of the business case. The proxy for the cost of equity is in line with the expected IRR, that is still as demanded by the Dutch Government. The Dutch Authorities further indicate that the business case results in an estimated project IRR of circa [1-5]% and an equity IRR around [1-5]%. On that basis, the Dutch Authorities further argue that, from a business perspective, there is no incentive to price below FCR levels.

5.4. Contribution to regional development and territorial cohesion

(136) The Dutch Government considers that the PALLAS project is in line with Article 174 TFEU, according to which "*In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions*".

(137) In this regard, the Dutch Government points out that the regional aid map for the Netherlands adopted by the European Commission on 27 January 2022 ([128]) includes the region Kop van Noord-Holland, and in particular the municipality of Schagen. Both the current HFR and the future PALLAS reactor are located in Petten, which is part of the municipality of Schagen.

(138) NRG has an important role in creating and maintaining high-quality employment locally. This concerns approximately 2 000 jobs (1 000 direct, 1 000 indirect) ([129]), which represents about 15% of employment in the municipality of Schagen. With NewCo, this employment is secured in the long term (> 40 years). Furthermore, the project will provide additional jobs during the construction and development of the PALLAS reactor.

(139) NRG also plays an important role in developing and opening up specialist knowledge in the nuclear field. This makes it an important source of knowledge

([127]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012, p. 8.

([128]) SA.100273 Regional aid map for the Netherlands (1 January 2022 – 31 December 2027).

([129]) See the 2020 report by the Dutch National Institute for Public Health and the Environment (RIVM) Supply security for medical radionuclides - additions 2020 (rivm.nl), p. 11.

for universities, other nuclear companies and the Dutch Authority for Nuclear Safety and Radiation Protection (ANVS). NewCo will continue this important contribution to the knowledge economy of the Kop van Noord-Holland.

(140) The Dutch Authorities therefore consider that the PALLAS project will make a significant contribution to the economic development of the Kop van Noord-Holland.

6. ASSESSMENT OF THE MEASURES

6.1. Relationship with the Euratom Treaty

(141) Article 106a(3) of the Euratom Treaty foresees that the provisions of the Treaty on the European Union and of the Treaty on the Functioning of the European Union (TFEU) shall not derogate from the provisions of this Treaty.

(142) Hence, as long as the application of the TFEU does not imply derogations from the Euratom Treaty, the TFEU applies.

(143) In addition, the Dutch Authorities argue that the notified measures should be assessed under Article 107(3)(c) TFEU.

6.2. Existence of State aid

(144) According to Article 107(1) TFEU, State aid is defined as any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods and affects trade between Member States.

(145) It follows that in order for a measure to qualify as State aid, the following cumulative conditions have to be met: (i) the beneficiary of the measure has to be an undertaking, (ii) the measure has to be granted through State resources and be imputable to the State, (iii) the measure has to confer an economic advantage, (iv) which is selective, (v) and has an effect on trade and competition.

(146) The beneficiaries of the proposed measures are, first, the PALLAS Foundation and, once it will be set up, NewCo. Both entities are undertakings as they carry out economic activities consisting in the present implementation (by the PALLAS Foundation) of Phase 1 of the PALLAS project, and in the future implementation (by NewCo) of Phase 2 of the project.

(147) The notified measures involve a transfer of State resources granted by the Dutch Authorities. The legal basis of the notified measures under Dutch law is the Comptabiliteitswet 2016 (Accounts Act 2016), which shows that the measures are imputable to the Dutch State. The funds for the loans and the financing of NewCo come from the Dutch Treasury, which shows that the measures involve State resources (recital (33)).

(148) As the financial situation of the beneficiary is relieved from a cost that would normally be part of its operating budget thanks to the Dutch Authorities' measures, these measures can be considered as procuring an economic advantage to the PALLAS project that the beneficiary could not have obtained under normal market conditions. Further, as the Dutch Authorities' measures are not, as such,

available on the private market, it cannot be argued that the funding provided by the State is in line with the market economy investor principle. The Dutch Authorities indeed acknowledge that, despite efforts to find private investors for the project, no such investor was willing to provide funding due to the high risks and uncertainties involved with the project. Further, the market consultation published by KPMG in July 2021 (mentioned in recital (48)) confirms that private investors are unwilling to take the considerable risks associated with nuclear projects.

(149) Further, the proposed measures are selective as they are provided to specific beneficiaries. As the Court has stated ([130]), where individual aid is at issue, the identification of the economic advantage is, in principle, sufficient to support the presumption that a measure is selective. This is so regardless of whether there are operators on the relevant markets that are in a comparable situation. Whilst the Netherlands has provided or may still provide State aid to other undertakings competing with the beneficiaries, in any event, the notified measures are not part of a broader measure of general economic policy to provide the same type of ad hoc support to undertakings, which are in a comparable legal and factual situation, active in the sector or other economic sectors, but are made available only to the beneficiaries.

(150) By favouring one particular reactor project, the notified measures are liable to distort competition among multipurpose research reactors used for the production of radioisotopes and for the provision of research and irradiation services, as well as with other actual or potential competing technologies. Further, in view of the EU-wide or even global character of the markets involved, the measures would clearly affect trade between Member States.

(151) Finally, the Dutch Authorities do not dispute the classification of the proposed measures as State aid.

(152) However, the Dutch Government puts forward that, in the light of the EU Framework for State aid for research and development and innovation (the "R&D&I Framework") ([131]), part of the research activities carried out by NewCo will be of a non-economic nature and are therefore, under section 2.1.1. ("Public funding of non-economic activities") of the R&D&I Framework, not covered by EU State aid law. More precisely, the Netherlands makes the following statements concerning the relevance of the R&D&I Framework in relation to the notified aid measures:

1) The research activities that are carried out by NRG|PALLAS, as well as the research activities that will be carried out by NewCo, are predominantly of a non-economic nature, aimed at creating more pre-competitive knowledge and understanding of nuclear medicine and the use of nuclear energy, and mostly conducted in effective collaboration with other research organisations. In particular, ca. 80% of the research activities carried out by NRG|PALLAS and then by NewCo, both in the field of nuclear medicine and in the field of

([130]) Case C-15/14 P, *Commission* v *MOL*, EU:C:2015:362, paragraph 60.

([131]) Communication from the Commission "Framework for State aid for research and development and innovation" 2022/C 414/01 (C/2022/7388), OJ C 414, 28.10.2022, p. 1-38.

nuclear energy, do not include the provision of R&D services to undertakings or R&D carried out on behalf of undertakings.

2) In so far as NewCo will provide R&D services to undertakings and will carry out R&D on behalf of undertakings, NewCo will provide these R&D services of an economic nature on the basis of market prices in accordance with section 2.2.1. of the R&D&I Framework. In case of effective collaboration with undertakings, NewCo will comply with section 2.2.2. of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration.

3) As concerns specifically research in the field of nuclear energy, NRG|PALLAS and its successor NewCo can be considered to be a research and knowledge dissemination organisation as defined by the R&D&I Framework ([132]), whose research results are disseminated on a non-exclusive and non-discriminatory basis. In any case, NRG implements a strict separation of economic and non-economic activities (in terms of funding, costs and revenues) so as to avoid any cross-subsidisation of the economic activities of NRG. The same will apply to NewCo as the successor of NRG|PALLAS.

4) As concerns specifically research activities in the field of nuclear medicine, these are currently carried out by NRG|PALLAS via the FIELD-LAB laboratory, which supports the development of new nuclear drugs for cancer treatment by University Medical Centres, start-ups and innovative pharmaceutical companies, and supplies small samples of ready-made radiochemicals for clinical trials. The research activities carried out in the FIELD-LAB are not independent, but do include effective collaboration as defined in the R&D&I Framework ([133]). In any case, NRG implements a strict separation of economic and non-economic activities (in terms of funding, costs and revenues) so as to avoid any cross-subsidisation of the economic activities of NRG. The same will apply to NewCo as the successor of NRG|PALLAS.

([132]) Under paragraph 16(ff) of the 2022 R&D&I Framework, "*'research and knowledge dissemination organisation' or 'research organisation' means an entity (such as universities or research institutes, technology transfer agencies, innovation intermediaries, research-oriented physical or virtual collaborative entities), irrespective of its legal status (organised under public or private law) or way of financing, whose primary goal is to independently conduct fundamental research, industrial research or experimental development or to widely disseminate the results of such activities by way of teaching, publication or knowledge transfer. Where such entity also pursues economic activities, the financing, the costs and the revenues of those economic activities must be accounted for separately. Undertakings that can exert a decisive influence upon such an entity, for example in the quality of shareholders or members, may not enjoy a preferential access to the results generated by it.*".

([133]) Under paragraph 16(h) of the 2022 R&D&I Framework, "*'effective collaboration' means collaboration between at least two independent parties to exchange knowledge or technology, or to achieve a common objective based on the division of labour where the parties jointly define the scope of the collaborative project, contribute to its implementation and share its risks, as well as its results. One or several parties may bear the full costs of the project and thus relieve other parties of its financial risks. Contract research and provision of research services are not considered forms of collaboration.*".

(153) As regards the alleged non-economic nature of part of the research activities carried out by NewCo, the Commission observes the following:

- Based on the information provided by the Netherlands, it indeed appears that some of the research activities carried out by NewCo will be of a non-economic nature. However, based on the information provided by the Netherlands, the Commission is unable to estimate exactly how much of the research activities carried out by NewCo will be of a non-economic nature.

- In any case, while NewCo will be an important player in nuclear research, the Netherlands indicates that, compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production. This is confirmed by data submitted by the Dutch Authorities, according to which NewCo's operational costs related to R&D&I are estimated to vary between [5-30]% and [5-30]% of the overall operational costs.

In light of the above considerations, the Commission acknowledges that part of the research activities carried out by NewCo will be of a non-economic nature.

(154) In view of the above, the proposed measures constitute State aid within the meaning of Article 107(1) TFEU.

6.3. Lawfulness of the aid

(155) In accordance with Article 108(3) TFEU and Article 3 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union ([134]), notifiable aid shall not be put into effect before the Commission has taken, or is deemed to have taken, a decision authorising such aid.

(156) On 26 June 2024, the Dutch Authorities notified two measures, namely A) some already granted loans not covered by the 2013 Decision and B) a public funding of NewCo.

(157) As regards the measure under A), it consists of loans that have already been granted to the PALLAS Foundation in the period 2019-2024 prior to the notification. Therefore, these loans must be considered to be unlawful aid, granted in breach of the standstill obligation under Article 108(3) TFEU and Article 3 of Council Regulation (EU) 2015/1589.

(158) As regards the measure under B), it consists of a public financing of a NewCo that has not been implemented prior to the notification. In addition, by e-mail of 28 June 2024, the Dutch Authorities clarified that the standstill obligation will be respected as no aid will be granted prior to the date of adoption of the Commission decision.

6.4. Compatibility of the aid

(159) The Dutch Government considers that the notified aid measures are compatible with the internal market, based on Article 107(3)(c) TFEU according to which

([134]) OJ L 248, 24.9.2015, p. 9-29.

"*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest*" may be considered to be compatible with the internal market.

(160) The Commission agrees that the compatibility of the notified measures is to be assessed under Article 107(3)(c) TFEU, since they do not fall within the scope of application of any specific guidelines. The Commission will therefore assess whether the notified measures i) facilitate the development of an economic activity or of an economic area (positive condition), and ii) do not adversely affect trading conditions to an extent contrary to the common interest (negative condition).

6.4.1. Positive condition: the aid must facilitate the development of an economic activity or of an economic area

6.4.1.1. The economic activity and the economic area supported by the aid

(161) As mentioned in recitals (4) to (10), the aid notified by the Dutch Authorities aims to support the construction of the PALLAS project, which includes a new reactor (PALLAS), as a replacement for the existing HFR, and an isotope processing facility, the NHC. The HFR, which is one of the world's largest suppliers of medical radioisotopes, is planned to close in the early 2030s. The PALLAS reactor will replace the HFR and will be used mainly for the production of medical isotopes, as well as for the production of industrial isotopes and for the provision of research and other services (multipurpose reactor). More particular, according to projections submitted by the Dutch Authorities, the NewCo that will build and operate the PALLAS project (including both the PALLAS reactor and the NHC) will have on average the following revenue percentages in the period 2033-2035: [50-80]% from the production and processing of medical isotopes; [1-5]% from the production of industrial isotopes; [15-30]% from research and other services, where the research activities represent [1-5]% of the revenues.

(162) The information summarised in recital (161) shows that the main economic activity supported by the aid is the production and processing of medical isotopes.

(163) In addition, as mentioned in recitals (136) to (140), both the current HFR and the future PALLAS project (including the reactor and the NHC) are located in the region Kop van Noord-Holland, and in particular in the municipality of Schagen which is included in the regional aid map for the Netherlands adopted by the European Commission on 27 January 2022 ([135]).

(164) The information summarised in recital (163) shows that the economic area supported by the aid is the region of Kop van Noord-Holland and, in particular, the municipality of Schagen.

([135]) SA.100273 Regional aid map for the Netherlands (1 January 2022 – 31 December 2027).

6.4.1.2. The aid facilitates the development of the economic activity and of the economic area

(165) The PALLAS project (including both the PALLAS reactor and the NHC) will be used mainly for the production and processing of medical isotopes. This shows that the aid aims at facilitating the development of the economic activity identified in recital (162), i.e. the production and processing of medical isotopes. In fact, as shown in particular in recitals (46) and (48), because private investors are unwilling to take many of the risks associated with the construction of a nuclear reactor project such as PALLAS, the latter would not materialise without the notified State aid measures.

(166) In addition, as explained by the Dutch Authorities (recitals (138) to (140)), both NRG (which operates the current HFR) and NewCo (which will operate the PALLAS reactor and the Nuclear Health Centre) have an important role in creating and maintaining high-quality employment in the region of Kop van Noord-Holland and, in particular, in the municipality of Schagen. This shows that the aid will facilitate the development of the economic area identified in recital (164), i.e. the region of Kop van Noord-Holland and, in particular, the municipality of Schagen.

(167) In light of recitals (165) and (166), the Commission concludes that the aid measures facilitate the development of the economic activity and of the economic area identified.

6.4.1.3. The aid and the activity comply with relevant EU laws

(168) State aid measures cannot be declared compatible with the internal market if the supported activity or the aid measure or the conditions attached to it entail a violation of relevant Union law.

(169) As shown in recitals (55) to (67), the Commission has received a formal complaint by the company SHINE alleging that the State aid supporting the PALLAS project may not be justified by the need to remedy a market failure and is likely to cause significant distortions to competition, which could be mitigated only if PALLAS implements the full cost recovery principle. As the complainant's allegations concern the issue whether the State aid in favour of the PALLAS project does, or does not, adversely affect trading conditions to an extent contrary to the common interest, the Commission will address the complainant's allegations further below in the section "Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

(170) As indicated in recitals (70) and (71), the Commission has also received a letter by the company NorthStar and by the U.S. Mission to the European Union. These letters put forward that the Commission, when assessing State aid in favour of the PALLAS project, should take into account the OECD-NEA recommendations aimed at creating an economically sustainable supply chain for medical radioisotopes by implementing the full cost recovery principle. Since these letters are not formal complaints, but merely market information, the Commission does not need to specifically address them. However, since the issue of the implementation of the full cost recovery principle is also raised by SHINE in its complaint, this issue will in fact be assessed below in the section "Negative

condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

(171) Finally, as regards EU rules not related to the protection of fair competition, the Commission has not received any complaints or information that might lead to the conclusion that the State aid in favour of the PALLAS project, the conditions attached to it, or the economic activities facilitated by the aid, are contrary to provisions of Union law. In fact, the general concerns about the environmental impacts of the PALLAS reactor, expressed in the citizens' letters of October 2022 (recitals (68) and (69)) ([136]), are not such as to call into question the results of the environmental impact assessments to which the PALLAS project has been subjected (recital (14)). In addition, the information submitted by the Dutch Authorities do not show that the aid, the conditions attached to it, or the economic activities facilitated by the aid, entail a violation of relevant Union law. Moreover, the Commission has not sent any reasoned opinion to the Netherlands on a possible infringement of Union law that would bear a relation to this case.

(172) It follows from the above that the aid in favour of the PALLAS project does not breach any relevant provision of Union law, without prejudice to the assessment of SHINE's complaint here below in the section "Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest".

6.4.2. Negative condition: the aid cannot unduly affect trading conditions to an extent contrary to the common interest

6.4.2.1. The market affected by the aid

(173) As mentioned in recital (9), the PALLAS reactor will produce medical isotopes for both diagnostic and therapeutic purposes.

(174) The market affected by the aid is therefore the worldwide market for medical isotopes, both diagnostic and therapeutic, described in recitals (35) to (54).

6.4.2.2. The positive effects of the aid measures

(175) As explained in recital (165), the aid to the PALLAS project will facilitate the development of the economic activity identified, i.e. the production and processing of medical isotopes.

(176) Besides its positive effect for the supported economic activity, the aid will have positive effects for society at large and the Union as a whole. In this regard, the Commission observes the following:

a) As shown in recitals (43), (44) and (52), a 2014 report by the European Observatory on the Supply of Medical Radioisotopes ([137]) concluded that the existing European network of reactors is fundamental to ensure the supply of medical radioisotopes, thereby making it necessary to undertake investments to refurbish the current fleet and to replace the capacity that will be lost as the

([136]) These letters are not formal complaints, but merely market information.

([137]) WG4_Report.pdf (europa.eu).

operating reactors reach the end of their lifespan ([138]). This finding of the Observatory was confirmed by two 2021 reports prepared for the European Commission, namely the NucAdvisor study ([139]) and the Technopolis study ([140]), both of which concluded that, if the EU's aging production capacity is not replaced in time, the EU will become increasingly dependent on countries outside Europe. In particular, the NucAdvisor study concluded that, to reduce the risk of supply shortages and to minimise EU dependence on countries outside Europe, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems such as SHINE, at least one new reactor ([141]). The PALLAS project supported by the Dutch Government aims precisely at building such a new reactor.

b) As explained in recital (54), besides the PALLAS project supported by the Dutch Government, several European countries (France, Belgium, Germany) are investing in new research reactors for the production of medical isotopes. However, since these reactors will be primarily aimed at research, their capacity to produce medical isotopes on a large scale is limited by the capacity needed for the research activities. This is why, according to the NucAdvisor and the Technopolis studies, the combined capacity of these new reactors, which are being developed in European countries other than the Netherlands, will be insufficient to meet European demand for both diagnostic and therapeutic isotopes ([142]). The additional capacity brought about by the PALLAS reactor is therefore needed to fill the expected supply gap.

c) While, compared to the HFR, the PALLAS reactor will have a stronger focus on isotope production, the PALLAS reactor will still continue many of the R&D&I activities already carried out in the HFR. In particular, PALLAS will collaborate with pharmaceutical companies that are developing new isotopes-based medicines (recital (89)). In addition, PALLAS will contribute to R&D&I in the continued safe operation of existing nuclear power plants, in the development of small modular reactors (SMRs) and in promising Generation IV designs such as thorium-fuelled molten salt reactors and high temperature reactors (recital (90)).

The above shows that the PALLAS project, by producing medical isotopes (needed to diagnose and treat life-threatening diseases including cancer) and by supporting R&D&I in nuclear medicine, will contribute to health protection by reducing the risk of shortages in the supply of medical isotopes, thereby benefiting patients in and outside Europe, and will minimise EU dependence on

([138]) This finding of the Observatory was included in the conclusions of a 2015 report by the Euratom Supply Agency (Activities following up the Council Conclusions of 15 December 2009 on the Security of Supply of Radioisotopes for Medical Use and the Council Conclusions of 6 December 2010 and 7 December 2012 'Towards the Secure Supply of Radioisotopes for Medical Use in the European Union' (europa.eu)).

([139]) Co-ordinated Approach to the Development and Supply of Radionuclides in the EU - N°ENER/D3/2019-231 - Final Report (nucadvisor.com).

([140]) Study on sustainable and resilient supply of medical radioisotopes in the EU - Therapeutic Radionuclides (technopolis-group. com).

([141]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([142]) NucAdvisor 2021, p. 15, p. 84, p. 124; Technopolis 2021, p. 55.

countries outside Europe in the field of medical isotopes. The Commission observes that ensuring security of supply of medical isotopes and minimising the EU's reliance on foreign supply are objectives pursued by the EU in the framework of the European Observatory on the Supply of Medical Radioisotopes (see recital (42)) and in the context of the SAMIRA action plan (see recital (45)). The same objectives are also pursued by other international organisations such as the OECD-NEA (see recital (41)). Furthermore, the PALLAS project, by supporting R&D&I in the continued safe operation of existing nuclear power plants and in the development of new nuclear power generation technologies, will additionally contribute to EU research in the field of nuclear power generation. The Commission observes that such contribution is in line with the objectives of the Euratom Treaty, in particular as concerns the promotion of nuclear research (Article 2(a) of the Euratom Treaty), ensuring nuclear safety (Article 2(b) of the Euratom Treaty) and facilitating investment into nuclear installations for development of nuclear energy (Article 2(c) of the Euratom Treaty).

(177) Based on the assessment in recital (176), the Commission therefore finds that the PALLAS project will contribute to the strategic autonomy of the EU in the field of medical isotopes and to EU research in the field of nuclear power generation.

(178) As regards the main diagnostic isotope Mo-99, the complainant states (recital (63)) that the implementation of the SHINE technology would make PALLAS not indispensable and, therefore, that PALLAS is not needed to ensure security of supply and Europe's self-sufficiency. In this regard, the Commission points out that, in the same meeting report quoted by the complainant, the paragraphs immediately after the ones referenced by the complainant ("the additional paragraphs") read as follows: "*But if only SHINE comes, there will be little wiggle room between demand and production capacity. This should be included in the margin of 35% (used for outages). Then you see that SHINE adds quite little leeway to this. Another nuance is the increasing demand for therapeutic isotopes. The chance of a capacity shortage is greater there (if only SHINE arrives). We still know too little about these factors. 5.i.2e indicates that it is important to know how likely it is that SHINE will actually get off the ground. This is a different analysis than we have seen so far. 5.1.2e adds that we must also see whether SHINE actually has a chance of success. There is still a lot of concern about this. 5.1.2e indicates that everyone who speaks to the Ministry of Health (outside SHINE) has major doubts about the chance of success.*" ([143]). The Commission observes that a joint consideration of both the paragraphs referenced by the complainant and of the additional paragraphs (the "complete text") shows that the opinion "if SHINE succeeds, the PALLAS reactor is not indispensable to ensure security of supply of Mo-99 in Europe" was nuanced in the meeting by the

([143]) These paragraphs (immediately after the text referenced by the complainant) read as follows in the original Dutch: "*Maar als alleen SHINE er komt, zit er weinig speelruimte tussen de vraag en productiecapaciteit. Dit zou meegenomen moeten zijn in de marge van 35% (die gehanteerd wordt voor uitval). Dan zie je dat SHINE hier vrij weinig speelruimte aan toevoegt. Een andere nuance is de toenemende vraag naar therapeutische isotopen. De kans op capaciteitstekort is daar groter (bij alleen komst van SHINE). Van deze factoren weten we nu nog te weinig van af. 5.i.2e geeft aan dat het van belang is om te weten hoe groot de kans is dat SHINE daadwerkelijk van de grond komt. Dit is een andere analyse dan we tot dusver hebben zien. 5.1.2e voegt hier aan toe dat we ook moeten kijken of SHINE daadwerkelijk een kans van slagen heeft. Er is nog veel zorg hierover. 5.1.2e geeft aan dat iedereen die VWS spreekt (buiten SHINE) grote twijfels heeft over de kans van slagen.*".

opinion "if only SHINE succeeds, there will be little room for manoeuvre between demand and production capacity" as well as by the opinion "there are major doubts about SHINE's chances of success". Second, the Commission observes that, since the opinions reflected in the complete text mainly concern *one isotope* (namely Mo-99) ([144]), those opinions cannot call into question the NucAdvisor study's conclusion that, to reduce the risk of supply shortages and to minimise EU reliance on foreign supply concerning *all necessary isotopes*, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems (such as SHINE), at least one new reactor (such as PALLAS) ([145]). In this regard, the Commission reminds that, while a nuclear research reactor (such as PALLAS) can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging technologies (such as SHINE) ([146]). Therefore, the production scope of emerging technologies (such as SHINE) is not as large as the production scope of a nuclear research reactor (such as PALLAS).

(179) Also as regards the main therapeutic isotope Lu-177, the complainant states (recital (64)) that PALLAS is unnecessary to ensure security of supply and Europe's self-sufficiency. According to the complainant, this is shown in the 2022 report "Production of ^{177}Lu using the SHINE technology" by the University of Delft ("the Delft report") ([147]), which has allegedly concluded that SHINE's planned production capacity of Lu-177 will be sufficient to supply the market (which is, at least, EU-wide or even global). In this regard, the Commission takes note that the conclusions in the Delft report read as follows: "*the TU Delft team regards production of sufficient amounts of high specific activity ^{177}Lu from the enriched ^{176}Yb production route using SHINE enrichment and separation technology as feasible*" ([148]). The Delft report further states that "*SHINE technology […] has two main advantages: a high quality ^{177}Lu, and the principal possibility to be backed up by (European) low flux research reactors for irradiation (ANNEX 13) if needed (ensuring EU delivery). Although SHINE's production process is a relatively complex one, its capacity is large at full operation. Thus, seen in terms of quality, capacity and back-up options, the TU Delft team regards SHINE technology as highly effective.*" ([149]). However, the Commission observes that the Delft report does not state that SHINE's planned production capacity of Lu-177 will be sufficient to supply the global market. In fact, the Delft report, after having estimated the annual demand for Lu-177 at ca.

([144]) The paragraphs referenced by the complainant discuss only the diagnostic isotope Mo-99, while the additional paragraphs broaden the discussion by considering therapeutic isotopes ("*Another nuance is the increasing demand for therapeutic isotopes. The chance of a capacity shortage is greater there (if only SHINE arrives).*"). However, the focus of the complete text remains Mo-99, also because at the time of the discussion (4 December 2020) it was thought that SHINE could not produce therapeutic isotopes (such as Lu-177). The fact that, based on the 2022 Delft report, it is now thought that SHINE can produce the therapeutic isotope Lu-177, is discussed below in recital (179).

([145]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([146]) NucAdvisor 2021, p. 153.

([147]) This report by the Reactor Instituut Delft of the University of Delft is available at 177Lu productie met de SHINE technologie | Rapport | Rijksoverheid.nl.

([148]) Page 12 of the Delft report.

([149]) Page 13 of the Delft report.

300 000 to 400 000 patient doses worldwide by 2040 ([150]), finds that SHINE's claim to be able to produce 250 000 patient doses annually is realistic ([151]). This means that, even in the case where SHINE will actually achieve it production target of 250 000 patient doses annually, this production will be lower than the estimated demand of ca. 300 000 to 400 000 patient doses worldwide by 2040. The Commission further observes that, until SHINE starts production based on its innovative technology and ramps it up to full operation ([152]), it cannot be taken for granted that SHINE will be successful ([153]). Finally, the Commission observes that, since it concerns only *one isotope* (namely Lu-177), the Delft report cannot call into question the NucAdvisor study's conclusion that, to reduce the risk of supply shortages and to minimise EU reliance on foreign supply concerning *all necessary isotopes*, investments should be made in Europe in a mix of technologies that would include, in addition to innovative systems (such as SHINE), at least one new reactor (such as PALLAS) ([154]). In this regard, the Commission reminds again that, while a nuclear research reactor (such as PALLAS) can simultaneously produce, in a proven and industrial manner, all nuclides generated by fission and neutron activation, both medical and industrial, this is not the case for emerging technologies (such as SHINE) ([155]). Therefore,

([150]) Page 15 of the Delft report: "*NUC (2021) envisages current EU demand as 10 000 patient doses annually (7.4 GBq each, standard treatment consists of 4 doses per patient), and anticipates a growth in demand that leads to > 100 000 doses annually per radiopharmaceutical in 2040. Worldwide, in all available info (literature, open sources) the general opinion is that a reasonable estimate is very difficult to substantiate, a best guess based on current knowledge could be ca. 300 000 a 400 000 patient doses worldwide by 2040.*"

([151]) Page 13 of the Delft report: "*SHINE claims to be able to produce 250 000 patient doses annually. This claim is considered by the TU Delft team as realistic (see ANNEX 15).*". See also page 17 of the same report: "*SHINE Medical Technology intends to produce 250 000 patient doses per year. Based on the information SHINE shared with the TU Delft team, and subsequent calculations by the TU Delft team based on this information, this should be achievable using the SHINE facilities, enrichment procedures and separation technology (see ANNEX point 15).*".

([152]) As explained in the Delf report (section "13. SHINE processing and distributing of either reactor-based ^{177}Lu, or SHINE-facility produced ^{177}Lu", page 18), SHINE, besides developing its innovative technology allowing to produce medical isotopes without a research reactor, can also rely on research reactors to produce medical isotopes. However, such a reactor-based production is only a back-up option, because SHINE aims to fully deploy its innovative technology that will not depend on research reactors (Delft report, page 13). For the time being and as of 2024, SHINE has been producing Lu-177 in the US based on the irradiation capacity of the Missouri University Research Reactor (thereby making use of the back-up option). However, SHINE has not yet started production based on its innovative technology that will not depend on research reactors.

([153]) As indicated by the NucAdvisor and Technopolis studies, innovative projects such as SHINE, despite promising extrapolations from laboratory experiments or validation of their individual components, still lack experience feedback of their first full scale industrial production. Until such feedback becomes available, it is not possible to assess in a compelling manner whether these novel technologies will be sufficiently competitive with nuclear research reactors (in terms of costs, production yields, reliability, product quality, etc.), thereby offering a valid industrial alternative (NucAdvisor 2021, p. 108). In particular, the SHINE project differs greatly from the current reactors and is based on innovative technologies, combining in an integrated manner nuclear, reprocessing and chemical processes, that still necessitate demonstration at full industrial scale (NucAdvisor 2021, p. 87, p. 98; Technopolis 2021, p. 58). Therefore, the Technopolis study concludes that these alternatives "*provide an innovative, but hardly proven option that requires time to scale up to global demand*" (Technopolis 2021, p. 63).

([154]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([155]) NucAdvisor 2021, p. 153.

the production scope of emerging technologies (such as SHINE) is not as large as the production scope of a nuclear research reactor (such as PALLAS).

(180) The complainant states (recital (65)) that, since the HFR produces Lu-177 by using Yb-176 sourced in Russia and since the PALLAS reactor (as the successor of the HFR) will probably do the same, the production of Lu-177 by the PALLAS reactor risks prolonging Europe's strategic dependency on Russia as regards the sourcing of Yb-176, thereby contradicting the idea that the PALLAS project serves the strategic autonomy of Europe. In this regard, the Commission observes, first, that it is not always feasible, or necessary, that an aided project establishes adequate strategic autonomy along the entire value chain of the strategic goods in question. The PALLAS reactor will contribute to European strategic autonomy in relation to the medical isotopes administered to patients. Second, while the project does not directly address strategic autonomy for the inputs used in the production of medical isotopes, the PALLAS project, by carrying out research into recycling technology for the re-use of Yb-176 targets, will contribute to reducing the use of new Yb-176 sourced in Russia. In addition, there is no reason to consider that the PALLAS reactor will not use alternative sources of Yb-176 when they become available.

(181) Based on the assessment in recitals (178) to (180), the Commission therefore confirms its finding in recital (177) that the PALLAS project will contribute to the strategic autonomy of the EU in the field of medical isotopes.

(182) The Dutch Authorities explain that the notified aid measures pursue three more objectives of common interest, namely: contributing to the mitigation of climate change (recitals (93) and (94)), limiting transport of nuclear materials in the EU (recital (95)) and promoting nuclear non-proliferation (recital (100)). The Commission observes that contributing to the mitigation of climate change is an objective pursued by the EU, in particular in the framework of the Taxonomy Regulation. The Commission further observes that limiting transport of nuclear materials and promoting nuclear non-proliferation are in line with the objectives of the Euratom Treaty, in particular as regards ensuring nuclear safety (Article 2(b) of the Euratom Treaty), and ensuring that nuclear materials are not diverted to purposes other than those for which they are intended (Article 2(e) of the Euratom Treaty).

(183) The assessment in recitals (176) to (182) shows that the aid in favour of the PALLAS project will have positive effects for society at large and the Union as a whole.

(184) This conclusion is not affected by the fact that some of the planned activities of the PALLAS multipurpose nuclear reactor may not relate to all the above objectives (e.g. the production of industrial radioisotopes is not relevant from the point of view of health protection). First, each of the planned activities is relevant from at least one of the above objectives (e.g. with respect to the production of industrial radioisotopes, the limitation of the transport of nuclear material and the promotion of non-proliferation remain valid objectives). Second, the multipurpose character is a standard feature of nuclear reactors used to produce isotopes, which

ensures an efficient utilisation of the reactor and diversification of revenue sources to cover its operating costs ([156]).

6.4.2.3. The negative effects of the aid on the internal market

6.4.2.3.1. Assessing how the aid minimises the distortions of competition and trade

a) Necessity of the aid

(185) The Dutch Authorities have made several attempts to attract private financing for the PALLAS project. These attempts were made first by ECN-NRG (recital (17)) and then by the PALLAS Foundation (recital (21), recitals (79) to (82)). The fact that all these attempts failed indicates that, without the notified aid measures, the PALLAS project would not materialise.

(186) This is also confirmed by the market consultation about nuclear power plants published by KPMG in July 2021 (recital (48)), which shows that, although private investors are willing to take some construction risks, they are not willing to take many of the other risks associated with nuclear reactor projects, notably black swan, regulatory and licence risks. The Commission's decision-making practice has also consistently recognised that investments into new nuclear projects were subject to market failures which called for State intervention, with respect to the scale of capital requirements, the longevity of exposure to market pricing signals and the longevity of exposure to varying political decisions ([157]).

(187) In addition, the failure of the attempts made to attract private financing for the PALLAS project is in line with the reports mentioned in recitals (46) and (47) of the present Decision, which show that prices for the irradiation of medical isotopes have been and still are too low for private investors to construct new research reactors to produce medical isotopes on a commercial basis.

(188) The NucAdvisor study ([158]) also indicates that, for large medical isotope production facilities, fully private initiatives might not be practicable, due to the known difficulty of implementing full cost recovery, the high investment costs and the relatively long durations for design, construction and licensing (pre-production).

(189) Based on the assessment in recitals (185) to (188), the Commission therefore finds that the aid in favour of the PALLAS project is necessary.

(190) The complainant states (see recital (66)) that the aid to the PALLAS project is not necessary because the market is already ensuring the production of key medical

([156]) See e.g. the Commission Staff Working Document accompanying the Commission Communication on medical applications of ionizing radiation and security of supply of radioisotopes for nuclear medicine of 6.8.2010, p. 14. (https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2010:0974:FIN:EN:PDF).

([157]) See the following Commission decisions: SA.58207, Dukovany, recitals 404-419; SA.38454, Paks II, recitals 303-313; SA.100338 Nuward 1, recital 112; SA.106964, Nuward 2, recital 106; SA.34947 Hinkley Point C, recital 89.

([158]) See e.g. NucAdvisor 2021, p. 18, p. 146, p. 156.

isotopes in the EU even without any State support, as demonstrated e.g. by the SHINE project. In this regard, the Commission observes that private investors' willingness to build projects such as SHINE, which use technologies other than nuclear research reactors, can call into question neither the above finding that private investors are not willing to take many of the risks associated with nuclear reactor projects (recital (186)), nor the above finding that prices of medical isotopes are too low for private investors to construct new nuclear reactors such as PALLAS (recital (187)).

(191) The complainant considers that, given the existing plans for the construction of additional capacity in Europe and in the world, there will be sufficient Mo-99 production capacity to cover the estimated worldwide demand (including the recommended outage reserve capacity), even without the PALLAS reactor. The complainant states that, even if some of that additional capacity did not materialise as planned, there is the potential to prolong the operation of some of the reactors that are currently foreseen to be decommissioned. Based on its opinion that there will be sufficient Mo-99 production capacity worldwide even without the PALLAS reactor, the complainant holds that the State aid in favour of the PALLAS project may not be justified by the need to remedy a market failure (see recital (62)). In this regard, the Commission observes that it cannot be taken for granted that it will be possible to prolong the operation of some of the reactors that are planned to be closed. The Commission further observes that the data referred to by the complainant concern additional capacity planned *in the whole world* (including Europe) for the production of *one isotope* (namely Mo-99), which cannot call into question the NucAdvisor study's conclusion that the construction of at least one new research reactor *in Europe* is needed to minimise EU reliance on foreign supply concerning *all necessary isotopes* ([159]).

(192) The complainant further considers (recital (62)) that, even assuming that State aid in favour of the PALLAS reactor (the main element of the PALLAS project) may be justified by the need to remedy a market failure, such a market failure however does not exist as regards a processing facility like the Nuclear Health Centre (the other element of the PALLAS project), because, in the complainant's view, a facility like the Nuclear Health Centre (as opposed to a reactor) can be built without major technical and financial difficulties. Therefore, in the complainant's view, any State aid to the PALLAS reactor should not be extended to the Nuclear Health Centre. In this regard, the Commission observes that, as explained by the Dutch Authorities (recital (95)), a major constraint in the supply chain of medical isotopes is their radioactive decay. Logistical efficiency and just-in-time delivery are essential for the economic sustainability of the global supply chain. The Energy & Health Campus in Petten, the location of the current HFR and of the future PALLAS reactor, is a unique site in Europe where both irradiation facilities (HFR/PALLAS reactor) and processing facilities for diagnostic medical isotopes (the Molybdenum Processing Facility ([160])) are located. With the Nuclear Health

([159]) See Scenario B.2 described by NucAdvisor 2021, p. 17, p. 136, p. 155.

([160]) The Molybdenum Processing Facility (MPF) is owned by the NRG and operated by Curium, the world's largest nuclear medicine company. Curium, as a separate legal entity with its own governance structure related to its private equity ownership, is completely independent from the HFR. In the MPF at Petten, Curium processes not only Uranium targets irradiated in the HFR, but also Uranium targets irradiated in other reactors such as the BR-2 reactor in Belgium and the MARIA reactor in Poland.

Centre (NHC), at the same site there will also be processing facilities for therapeutic isotopes ([161]). This makes sure that transport of radioactive material across Europe can be minimised and optimised, which contributes to safety and security for EU citizens. In addition, as explained by the Dutch Authorities (recital (97)), while "dedicated" processing facilities (i.e. processing facilities developed by pharmaceutical companies exclusively for their specific medical isotopes which have already passed all relevant testing and registration requirements) may indeed be attractive for private investors, the NHC will not be such a dedicated facility. Finally, as explained by the Dutch Authorities (recital (98)), the inclusion of the NHC in the PALLAS project makes sense from a financial viewpoint, because the revenues of the NHC will shorten by two years the payback period of the public loans granted to NewCo. Therefore, the Commission concurs with the Dutch Authorities that it is necessary to support the PALLAS project as a whole comprising both the PALLAS reactor and the NHC.

(193) Based on the assessment in recitals (190) to (192), the Commission therefore confirms its finding in recital (189) that the aid in favour of the PALLAS project is necessary.

b) Appropriateness of the aid

(194) As shown above (recitals (185) to (193)), because private investors are unwilling to take many of the risks associated with the construction of a nuclear reactor project such as PALLAS, the latter would not materialise without the notified State aid measures.

(195) Since, absent the State aid, the PALLAS project would not be built, the Commission considers that there is in practice no alternative policy instrument that the Dutch Authorities could implement to fully achieve all the objectives of the PALLAS project identified in recitals (176) to (183). In particular, if the PALLAS project is not built, the objectives of strengthening the strategic autonomy of the EU in the field of medical isotopes and promoting EU research in the field of nuclear power generation could not be achieved.

(196) Indeed, even ignoring the demonstrated failure to attract private market operators to finance the project, possible alternative public policy tools such as public-private partnerships (PPPs) or other regulatory incentives could not have been considered as appropriate to fully achieve the objectives of the PALLAS project for the following reasons:

- As regards PPPs, while they can sometimes be a less distortive form of support than direct State aid, in the case of nuclear reactors, the risks and capital requirements might still deter private investors and partners.

- As regards other regulatory incentives such as tax incentives, guarantees or favourable tariff structures, such measures may still prove insufficient and/or inadequate in attracting sufficient private investment if the underlying risks remain unaddressed.

([161]) However, the Dutch Authorities do not exclude the possibility that, at some point in its lifetime, the NHC will be used to process not only therapeutic, but also diagnostic isotopes.

- As regards other possible non-financial interventions such as, typically, administrative support, while streamlining administrative processes or providing technical assistance can facilitate investments, they are unlikely to mitigate the financial barriers and/or bridge significant financial gaps and therefore constitute a genuine alternative to direct State aid.

(197) The same conclusion applies when other direct State aid measures are considered as possible alternatives to the notified loans and equity measures, for the following reasons:

- As regards grants, while they are a common form of State aid, they can be more distortive as they do not need to be repaid and therefore might be seen as providing undue advantage over competitors thus leading to significant distortions in the market.

- As regards government guarantees on loans, while they can mitigate investment risks and attract private financing, their effectiveness is limited if the market perceives the inherent risks of the (nuclear) project to be too high. In addition, guarantees do not provide upfront capital, which is essential for such capital-intensive projects.

- As regards tax incentives, while benefiting from tax breaks or incentives can reduce the financial burden on the project, tax incentives alone may not provide the immediate capital needed and often fail to address the high-risk nature of investments such as the PALLAS project.

(198) Compared to the possible alternatives considered above in recitals (196) and (197), direct government investments through loans and equity, such as the ones designed by the Dutch Authorities for the PALLAS project, ensure that a project is adequately funded from the outset, addressing both the capital requirement and the risk mitigation needed to make such projects viable and capable of reaching completion. In addition, loans and equity, such as the ones designed by the Dutch Authorities for the PALLAS project, involve a financial commitment that typically requires repayment in the form of interests and dividends, which contribute to making the project less distortive of competition.

(199) In this context, the Commission considers that the [20-60]%/[40-80]% long-term debt-to-equity ratio that will be used to finance the PALLAS project is appropriate for the following main reasons:

- Debt financing typically has a lower cost of capital compared to equity. This is because debt holders have a prior claim on the company’s assets and income, which makes debt less risky from the lender’s perspective and therefore cheaper. In addition, interest payments on debt are usually tax-deductible, which can provide significant tax benefits to the company, reducing the overall cost of capital. Furthermore, for a capital-intensive project like a nuclear reactor, long-term debt can be appropriate because the project is expected to generate stable and predictable cash flows once operational. This stability makes it feasible to service debt over the long term.

- Unlike debt, equity financing does not require immediate repayment. This can be crucial during the initial years of the project when the company might not yet be generating sufficient cash flows to cover large debt payments. In addition, by

financing [40-80]% of the project with equity, the Dutch Authorities ensure that there is a substantial buffer to absorb any cost overruns, delays, or operational challenges (which are common in large infrastructure projects) as equity investors absorb more risk compared to debt holders.

- The [20-60]%/[40-80]% debt-to-equity ratio is a common structure in the financing of large infrastructure projects, including energy projects. This ratio strikes a balance between leveraging the project sufficiently to make it financially viable while maintaining a solid equity base to mitigate risks.

- Overall, given the high operational risks associated with nuclear reactors, a balanced debt-to-equity ratio, such as [20-60]%/[40-80]% in the case of the PALLAS project, ensures that the company maintains financial stability and flexibility. A higher equity ratio would imply a higher total cost of capital, while a higher debt ratio would increase financial risk and potential insolvency risks.

(200) It is against this background that the appropriateness of the issuance and refinancing of the loans that were granted until the incorporation of NewCo must be assessed. Indeed, as explained above (recitals (196) and (197)), no other public policy tool or measure would have been more appropriate than such loan financing while the Dutch Authorities were trying to raise private funding for the project, which eventually proved to be unsuccessful. Now that the complete funding structure of the PALLAS project has been put in place, those loans, that are already scheduled to be refinanced into long-term debt, will purposely find their place in the [20-60]%/[40-80]% long-term debt/equity financing structure, and thereby efficiently complement the other funding instruments.

(201) On the basis of all the above, the Commission concludes that the [20-60]%/[40-80]% combination of long-term debt and equity, including the refinancing of the loans that were granted until the incorporation of NewCo, is a balanced approach that supports the project's long-term success and must be considered as appropriate for the financing of the PALLAS project due to its ability to balance risk, cost of capital and financial stability, in particular acknowledging that, without such financial contributions, the project would not materialise.

(202) In the light of the considerations in recitals (195) to (201), the notified aid represents an appropriate instrument for achieving the identified objectives.

c) Proportionality of the aid

(203) The principle of proportionality requires that the aid measures do not exceed what is appropriate in order to attain their objectives. Thus, if the planning and construction of the PALLAS project could be achieved with less aid, then the aid would not be considered proportionate.

(204) The Commission determines the maximum aid level with regard to the identified funding gap. The funding gap refers to the difference between the positive and negative cash flows over the lifetime of the investment, discounted to their current value on the basis of an appropriate discount factor reflecting the rate of return necessary for the beneficiary to carry out the project notably in view of the risks involved.

(205) The Dutch Authorities provided a funding gap analysis for the project and limited the aid so that it does not exceed the funding gap. Although, from a procedural point of view, the measures subject of the present Decision can be seen as two separate sets of measures, insofar as they consist, on the one hand, of non-notified measures concerning the past and, on the other hand, of notified measures concerning the future, it is however clear that from, a substantive point of view, the whole public intervention refers to the preparation, the construction and the operation of a single and indivisible project. The assessment of the Commission will therefore consider the project as a whole.

(206) The funding gap analysis is based on a 52-year business plan (for the years between 2019 and 2070) (recital ((105)). The length of the business plan period includes 5 years and a half of preparation phase (until the date of incorporation of NewCo set in the Financial Model at 1 July 2024), 6 and a half years of construction phase, two years of transition in which the production will be shifted to the PALLAS reactor, and 38 years, from 2033 onwards, in which NewCo will be generating revenues from the PALLAS reactor and NHC.

(207) The Commission considers it credible that NewCo would not invest in an alternative project if the aid measures were not provided. Likewise, the Commission considers it credible that the counterfactual to the proposed investment is no alternative investment, therefore the funding gap has been determined exclusively on the basis of the factual scenario.

(208) It therefore needs to be assessed whether the underlying assumptions of the PALLAS funding gap model submitted by the Dutch Authorities are appropriate in view of the nature, scope and risks of the project.

Revenues

(209) The Commission notes that, as described in recitals (112) to (114), following a transition period of two years, production from the PALLAS reactor and NHC is expected to start from 2033. For the period 2033 to 2070, the estimation of revenues is modelled based on key assumptions regarding total market demand and market shares. The Commission considers the relevant evidence specific to the beneficiary to be a reasonable justification for the period 2033 to 2070. In order to assess the estimation of the market price, the Commission took consideration of historical prices and annual increases currently charged by the HFR reactor to its main customers, Curium and IRE. Additionally, the Commission notes that the revenue evolution in the business plan in line with industry expectations, which account for the differing growth rates between the different isotopes markets (e.g., Mo-99 (unprocessed), therapeutic). Therefore, despite inherent market uncertainty, the Commission considers the estimated market prices and revenues to be reasonable.

(210) Based on the above elements, the Commission considers the modelled revenues in the funding gap analysis to be reasonable.

Costs

(211) As to the costs, the Dutch Authorities explained that the financial model includes all costs relating to the operations of the PALLAS reactor and NHC. As described in recital (116), costs include all regular operational expenses (including

personnel, fuel costs, maintenance, overhead etc.), depreciation, financing (interest) costs, as well as provisions, among others. The Commission considers the estimated cost evolution to be reasonable and in line with inflation.

(212) The investment budget amounts to EUR [2-3] billion (in nominal prices) which the Commission considers as an appropriate estimate. As regards investment costs, PALLAS uses a linear depreciation model in line with the accounting practice of the company and the useful life of the assets, which is estimated to be 40 years. The Commission considers this linear depreciation model to be credible as it is the method used by the company and the useful life of the project's assets is in line with the technical lifespan of similar reactors.

Weighted Average Cost of Capital

(213) To compute the funding gap, an appropriate discount rate has to be used to discount the future cash flows. The Dutch Authorities used the WACC as discount rate. The WACC is the weighted average of cost of debt ('Kd') and cost of equity ('Ke') for a company. The weights used are the proportion of Equity ('E') and of Debt ('D') in the capital structure of the company (E+D). The tax rate is denoted by 't'. The WACC is computed as follows:

WACC=Kd*D/(E+D)(1-t)+Ke*E/(E+D).

(214) The estimates for the cost of debt and cost of equity are obtained on the basis of standard approaches according to the following formulas:

Kd = risk-free rate + risk premium on debt, and

Ke = risk-free rate + levered beta * risk premium on equity + project specific risk premia.

(215) The Dutch Authorities have estimated the WACC a typical investor would require for a project with comparable risk characteristics. The figures used for the cost of debt, cost of equity and unlevered beta were updated to the latest information available. On this basis, the Dutch Authorities submit that the WACC in a baseline scenario amounts to [10-20]%.

(216) As regards the cost of debt, the Dutch Authorities have applied a base rate based on the 1-month EURIBOR estimated at 3.579% by Bloomberg, as per 15 June 2024. The Commission considers that the risk rate methodology used by the Dutch Authorities is reasonable. At the same time, it does not fully take into account the long useful life and duration of the project. Hence, the Commission has performed a sensitivity scenario which applies the risk-free rate estimated at [1-5]% based on the 30-year Dutch Government bond rate, as described in recital (224).

(217) In addition, the Dutch Authorities apply an interest margin of [400-800] bps, which corresponds to a […] rating with […] level of security or a […]rating with […] level of security on the basis of the Communication from the Commission on the revision of the method for setting the reference and discount rates (2008/C

14/02) [162]. The Commission therefore considers the estimates of the interest margin reasonable in light of the duration of the project and the investment and operational risks involved ([163]).

(218) As regards the cost of equity, and as described in recital (108), the debt-to-equity ratio of [30-70]% has been determined based on the level of debt that the business case of PALLAS can reasonably bear (given the applicable contractual interest rates). The tax rate of 25.80% corresponds to the corporate tax rate applicable to the Netherlands.

(219) The Commission also considers that the market risk premium set at [1-10]% is reasonable and in line with estimates from well-established sources in financial analysis such as Professor Damodaran and Fernandez et al. ([164]).

(220) The Dutch Authorities have determined an unlevered beta of [0.5-2.5] using data for large, listed companies collected from Capital IQ. The Commission notes that the comparable companies are active mainly in the construction business. In light of the relatively high construction risk of the project the Commission considers that such a benchmarking group is relevant. At the same time, the Commission also notes that the nuclear nature of the project may be associated with some risks, which could justify an increase in the project's riskiness and thus the inclusion of a project-specific risk premium in the cost of equity.

(221) The additional project risk premium has been estimated by the Dutch Authorities at [1-10]%, based upon a size premium of [1-5]% and an additional risk premium of [1-5]% for specific risks related to nuclear construction projects. The size premium was estimated by the Dutch Authorities based upon Kroll's Center for Research in Security Prices Decile Size Study ([165]), and is justified based on specific characteristics of the project, such as its reliance on a single asset (i.e. the PALLAS reactor), its concentration of revenue sources in only two markets (diagnostic isotopes and therapeutic isotopes) and its operation with a limited number of key clients, particularly in the Mo-99 business. The additional risk premium is also justified with reference to the significant uncertainties in the project, for example uncertainties related to offtake in the therapeutic isotopes market.

(222) The Commission considers that, although the level of additional risk premium is subject to uncertainty due to lack of comparable data, it still appears to be high compared to construction projects of similar size and investment budget. In addition, based on market reports and external sources ([166]), the Commission notes that equity returns for nuclear power plants range from 7% to 15%.

([162]) OJ C 14, 19.1.2008, p. 6-9.

([163]) In addition to the typical operational risks, the Commission notes that the company is also subject to competition distortion measures which may limit its commercial ability to set prices.

([164]) See Damodaran On-line Home Page (nyu.edu) and Fernandez, Pablo and Garcia de la Garza, Diego and Fernández Acín, Javier, Survey: Market Risk Premium and Risk-Free Rate used for 80 countries in 2023 (April 3, 2023).

([165]) Kroll, 2023.

([166]) KPMG - Nuclear energy market consultation (2021), TNO (2018), National Audit office (2017), and Imperial College London (2013).

However, these projects mostly relate to time periods with lower risk-free rates, which could justify the lower equity returns. Additionally, these projects often have in-build mechanisms to reduce the level of riskiness (e.g. on the revenues side). ([167]) Hence the Commission considers justifiable to introduce an additional risk premium of around [1-5]% to capture all the project specific risks (i.e. instead of the [1-10]% cumulative premia estimated by the Dutch Authorities for the size premium and the additional risk premium).

(223) Overall, the Commission considers that the components of the WACC as outlined in the above recitals and as submitted by the Dutch Authorities are reasonable in view of the size, the risks, the timing, and the type of activity of the project. At the same time, the Commission has also analysed a scenario it views as a more likely baseline scenario, with an adjusted WACC, as shown in the table below, that reflect assumptions that the Commission considers as more reasonable in light of the observations made above, notably regarding the risk-free rate and additional risk premia.

WACC assumptions	**EC Base case WACC**
Unlevered beta	[0.5-2.5]
E/(D+E)	[40-80]%
D/(D+E)	[20-60%]%
Levered beta	[0-2]
Risk-free rate	[1-5]%
Market risk premium	[1-10]%
Additional risk premium	[1-5]%
CoE	**[10-20]%**
Risk-free rate	[1-5]%
Risk premium on debt	[1-10]%
CoD (after tax)	**[1-10]%**
WACC	**[10-20]%**

(224) Moreover, the Dutch Authorities have also provided a sensitivity analysis in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium of [1-5]%. Results from the sensitivity are shown in recital (234).

Aid element

(225) In order to assess the aid element, the gross grant equivalent of the aid is calculated, and it includes the aid resulting from the State loans and the capital injections.

(226) Concerning the Senior Debt, as described in recital (128)(b), the Dutch Authorities determined the gross grant equivalent on the Senior Debt based on the NPV of the difference in interest charges between Q3 2024 and the full

([167]) The Pallas project instead, is subject to some constraints on the commercial behaviour in light of the Commitments set out in the Trustee Mandate and the present Decision.

redemption of the government loans (end of 2049) applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs that result based on the interest rates from the Draft Credit Agreement. The interest costs in both scenarios are based on the outstanding debt balance resulting from the business case.

(227) Concerning the already granted loans not covered by the 2013 Decision (referred to as Old debt), as described in recital (128)(c), the Dutch Authorities have used the same approach as for the Senior Debt and considered the NPV of the difference in interest charges when applying an assumed market Cost of Debt (pre-tax) and comparing this with the interest costs included in the business case for the PALLAS project, multiplied by the outstanding debt balance resulting from the business case.

(228) The Commission considers it appropriate that, in this case, the aid element corresponds to the difference between the actual interest included in the business case and the scenario where the assumed market parameters are applied. Without aid, PALLAS is expected to pay the market cost of debt. In turn, taking the difference between the two rates captures the overall advantage from the State loans.

(229) For both the Senior debt and the Old Debt, the Dutch Authorities discounted the difference in interest costs using a WACC of [10-20]%, according to their approach as described in recital (128)(b). The Commission has also considered a sensitivity analysis where the cost of debt is used as the discount rate for this calculation ([168]).

(230) Moreover, for both the Senior debt and the Old Debt, the Dutch Authorities assessed the pre-tax difference between the actual returns included in the business case and the scenario where the assumed market returns are applied. However, the Commission believes it is more appropriate to consider the post-tax difference between the actual and the market returns. The Commission has conducted an additional simulation to determine the NPV of the post-tax difference between the actual returns and the assumed market returns. The results of this simulation, summarised in Table 4, confirm that the aid is proportionate.

Table 4: Commission baseline scenario for the proportionality analysis

NPV gap analysis	
WACC assumptions	**EC Base case WACC**
Cost of Equity	[10-20]%
E/(D+E)	[40-80]%
Cost of Debt (after tax)	[1-10]%
D/(D+E)	[20-60]%
WACC	**[10-20]%**
EURk	

([168]) The Commission has conducted a sensitivity analysis based on the scenario it views as a more likely baseline scenario, as described in recital (212). Results from the sensitivity analysis confirm that the aid is proportionate.

Aid element - Equity	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**
funding gap	[1 000 000-2 000 000]
NPV gap	[50 000-400 000]

(231) Concerning the capital injections, as described in recital (128)(a), the Dutch Authorities determined the gross grant equivalent on equity considering the NPV of all equity cash flows (i.e. disbursements to NewCo and dividends paid by NewCo), discounting by the Cost of Equity (of [10-30]%) ([169]).

(232) The Commission has conducted a series of sensitivity analyses ([170]), as outlined in the above recitals, which, lead to results that are close to those provided by the Dutch Authorities, as shown in Table 5 under the column "Base case WACC". Results from this analysis show that the aid element is lower than the funding gap.

(233) In addition, as described in recital (130), the Dutch Authorities have provided a sensitivity analysis in which they used a WACC based exclusively on observable market data, therefore excluding the additional risk premium of [1-5]% (WACC excl. ARP column). It results from the WACC sensitivity that the aid can be found proportionate also under such a scenario, as shown in Table 5.

Table 5: Summary of the proportionality analysis, with sensitivity on the WACC

NPV gap analysis

WACC assumptions	**WACC excl. ARP**	**Base case WACC**
Cost of Equity	[10-20]%	[10-20]%
E/(D+E)	[40-80]%	[40-80]%
Cost of Debt (after tax)	[1-10]%	[1-10]%
D/(D+E)	[20-60]%	[20-60]%
WACC	[10-20]%	[10-20]%

([169]) The Commission conducted an additional simulation to determine the aid element from capital injections by considering the NPV of the equity disbursement, excluding dividend payments. Results from the simulation confirm that the aid can be found proportionate under all considered scenarios. For clarity purposes, it must be pointed out that the Commission's proportionality assessment includes all disbursements from the Dutch Government to the PALLAS Foundation that were not covered by the 2013 Decision, i.e. including those made in the period 2019-2024 for a total of EUR 425.7 million (40 million in 2019, 46 million in 2020, 30 million in 2021, 60 million in 2022, 148.7 million in 2023, 59 million in March 2024 and 42 million in June 2024) as well as the possible further disbursement of EUR 44 million (which, as explained in recital 27 of the present Decision, the Dutch Government could grant to the PALLAS Foundation before the incorporation of NewCo, thereby leading to a total amount of the loans granted to the PALLAS Foundation equalling EUR 469.7 million).

([170]) The Commission has also conducted a sensitivity analysis using a WACC of 16%, which aligns with the complainant's submission based on a study by Oxera estimating the overall return required by a hypothetical private investor to finance the PALLAS project. Results from the analysis confirm that the aid remains proportionate under this scenario.

EURk		
Aid element - Equity	[500 000-800 000]	[500 000-800 000]
Aid element - Senior debt	[100 000-400 000]	[100 000-400 000]
Aid element - Old debt	[200 000-500 000]	[200 000-500 000]
Aid element total	**[800 000-1 700 000]**	**[800 000-1 700 000]**
funding gap	([1 000 000-2 000 000])	([1 000 000-2 000 000])
NPV gap	**([50 000-400 000])**	**([50 000-400 000])**

Source: Information provided by the Dutch Authorities in the Notification

(234) Finally, the Commission notes that, in all the scenarios described above, the aid element is lower than the CapEx of EUR [2-3] billion, as described in recital (104). This indicates that the aid provided by the Dutch Authorities has been granted solely in relation to the CapEx.

(235) The Commission therefore considers that it can be concluded that the aid, including both the State aid associated with State loans (Senior Debt and Old Debt) and the capital injections, is proportionate to achieve the intended objective and to avoid any potential risk of overcompensation.

d) Transparency of the aid

(236) As explained above (recital (34)), the Dutch Authorities commit to publish on the website State Aid Transparency Public Search (europa.eu) the following information: the full text of the individual aid granting decision and its implementing provisions, or a link to it; the identity of the granting authorities; the identity of the individual beneficiary, the aid instrument and amount of aid granted to the beneficiary; the objective of the aid, the date of granting, the type of undertaking (for example SME, large company); the Commission's aid measure reference number; the region where the beneficiary is located (at NUTS level 2) and the principal economic sector of the beneficiary (at NACE group level).

(237) Based on the foregoing, the Commission concludes that the aid in favour of the PALLAS project will be granted in a transparent way.

6.4.2.3.2. Identifying the outstanding distortions of trading conditions which cannot be avoided (despite the aid being necessary, appropriate, proportionate)

(238) By definition, any aid measure distorts competition and trade, even if the measure effectively facilitates the development of a certain economic activity and even if it is necessary, appropriate and proportionate. In particular, aid measures that support the development of the economic activity of a given beneficiary are likely to undermine other operators of the same economic activity and operators of substitutable economic activities.

(239) Despite their being necessary, appropriate and proportionate (as shown in recitals (185) to (235)), the aid measures in favour of the PALLAS project could have a negative impact on other producers of medical isotopes. Given the at least EU-wide (and, in fact, even global) character of the market for medical isotopes, such a negative impact could affect, not only operators established in the Netherlands,

such as for example the company SHINE Europe B.V. (see recitals (55) to (59)), but also operators established in other EU and EEA countries.

(240) However, the impact of the aid in favour of the PALLAS project on competition and trade will be reduced by some mitigating factors, as shown in the following recitals.

(241) Firstly, given the importance of the HFR (which serves approximately 30% of the world market and 70% of the European market: recital (39)) and given the capacity limitations of the other existing or planned research reactors (recitals (39) to (41); recital (54)), it cannot be expected that the latter will be able to fill the supply gap if the HFR is not replaced by the PALLAS reactor. Further, the history of the project has shown that purely private investment into the construction of any other research reactor is currently highly unlikely (recitals (46) to (48)). Therefore, the State aid in favour of the PALLAS project is not likely to have any inappropriate crowding-out effect vis-à-vis other reactor projects.

(242) Secondly, as regards a potential crowding-out effect vis-à-vis alternative technologies, the Commission observes that, given the expected increase in world demand for medical isotopes (recitals (36) and (37)) and given the foreseen closure of many of the existing research reactors (recital (40)), the construction of the PALLAS reactor (as replacement for the HFR) is unlikely to lead to a situation where there would be no room for innovative projects in a market, such as the medical isotopes one, where purchasers need the presence of multiple producers. The following should in fact be considered: (i) it is uncertain whether and to what extent it will be possible to prolong the operation of some of the existing multipurpose research reactors that are foreseen to be closed; (ii) in the medical isotopes industry, it is important to maintain a production capacity exceeding demand (outage reserve capacity) so as to cope with both planned and unexpected production breaks (recitals (40) and (41)); (iii) due to their short decay times and to the strict rules for their transportation, at least certain medical isotopes (especially Mo-99 and Tc-99m) cannot be stockpiled and must be produced continuously (recital (37)) so as to be able to reach the patients on time. The above considerations corroborate the view that purchasers of medical isotopes need the presence of multiple producers in the market. This is the reason why the NucAdvisor study recommends diversified investments in Europe including a combination of at least one new reactor, such as PALLAS, and of innovative projects, such as SHINE. In this regard, the Commission notes that, according to the available information, the SHINE project has been supported by both the Dutch Authorities (see point 5) in recital (131)) and the US Authorities (recitals (60), (86) and (132)).Finally, as regards the complainant's statement (recital (60)) that the demise of the SMART project was mainly due to the State aid in favour of PALLAS, the Commission observes that the available information ([171]) suggests that, while plans for new research reactors, including PALLAS, have probably been taken into account in deciding that demise, there

([171]) ASML's medical-isotope brainchild doesn't make it to the finish line – Bits&Chips (bits-chips.nl) and Escalating complexity thwarts industrialization of non-nuclear radioisotope production – Bits&Chips (bits-chips.nl).

were indeed intrinsic technical difficulties hindering the industrial scale-up of the SMART project.

(243) Thirdly, according to a 2022 report made for the Dutch Government by KPMG (see point 2) in recital (131)), the market shares of NewCo, the operator of the PALLAS reactor, in the worldwide markets for diagnostic and therapeutic isotopes will be roughly the same as the current market shares of NRG, the operator of the existing HFR.

(244) Fourthly, as explained by the Dutch Government (see point 4) in recital (131)), NewCo will allocate costs in such a way as to avoid any cross-subsidisation between its R&D&I activities and the production of medical isotopes. Furthermore, in case of effective collaboration with undertakings, NewCo will comply with section 2.2.2. of the R&D&I Framework, including in particular the provisions under paragraph 29 of the Framework aimed at ensuring that no indirect State aid is awarded through NewCo to the participating undertakings due to favourable conditions of the collaboration. These measures will further diminish potential distortions of competition and trade caused by the aid in favour of the PALLAS project. In addition, as explained in recitals (152) and (153), part of the research activities carried out by NewCo will be of a non-economic nature.

(245) Finally, as pointed out by the Dutch Authorities (see point 3) in recital (131)), any distortions of competition and trade caused by the aid in favour of the PALLAS project will be lessened by the fact that NewCo will repay the public funding, and will charge prices for its medical isotopes that reflect the full production costs. Further, the prices charged by NewCo will include a reasonable profit margin. NewCo will thus implement an FCR model, in line with the objectives of the OECD-NEA and of the European Observatory on the Supply of Medical Radioisotopes, thereby contributing to making the medical isotope sector economically sustainable.

(246) Concerning the implementation by NewCo of the FCR principle (mentioned in recital (245)), the Commission takes note that the Dutch Authorities foresee that this shall be monitored by an independent Trustee who shall act on behalf of the Commission in compliance with the Mandate submitted to the Commission by the Dutch Government, which is attached to the present Decision (recital (133)). The Trustee Mandate foresees in particular a "Full Cost Coverage Commitment" and a "No Lowest Price Leader Commitment" to be complied with by NewCo and to be monitored by the Trustee. Pursuant to the Mandate, the monitoring and reporting by the Trustee will enable the Dutch State to demonstrate to the Commission that the Commitments under the Mandate are properly implemented and enforced, so as to confirm in particular that NewCo – when executing the PALLAS programme – behaves in a commercially appropriate manner and does not implement predatory pricing strategies through e.g. cross-subsidisation across commercialised isotopes because of its public funding.

(247) As regards specifically the "Full Cost Coverage Commitment", also referred to as "FCC", foreseen by the Trustee Mandate, the Commission considers that it is in line with the spirit of the FCR principle developed by the OECD-NEA. In particular, the "Full Cost Coverage Commitment" proposed by the Dutch

Authorities takes due account of the OECD-NEA Guidance Document proposing an FCR methodology ([172]), which (on page 8) contains the following indications: "*It is not mandatory that a reactor operator applies this methodology exactly as described in this document. The methodology provides consistent guidance to all reactors, but some reactor operators may already be using their own full-cost identification and recovery methodology. If they can demonstrate that their methodology is compliant with the full-cost recovery principles established and described in this guidance document, such that all relevant costs are identified and recovered, that will be sufficient. [...] Operators have the responsibility to adhere to the principle of full-cost recovery and to ensure it is implemented, respecting applicable domestic accounting law and competition rules. It should be recognised that there may be differences in how such analyses are performed to align with accounting standards and financial reporting. However, this guidance document is for a different purpose and should not be seen as incompatible with those other reports; they all have specific objectives and therefore do not need to be perfectly consistent*". Indeed, the Commission considers that the "Full Cost Coverage Commitment", as proposed by the Dutch Authorities and monitored by the Trustee, ensures that "*all relevant costs are identified and recovered*", as required by the OECD-NEA Guidance Document ([173]).

Assessment of the complainant's allegations about the actual implementation by NewCo of the FCR principle

(248) As regards the actual implementation by NewCo of the FCR principle, the complainant expresses several doubts, which are discussed in the recitals here below.

(249) The complainant states (see point 1) in recital (61)) that, despite the KPMG's 2021 market consultation and an Oxera study indicating that market rates for financing a project like PALLAS are in the range "above 12% to 18.2%" interest per annum (on a nominal basis), the Dutch Authorities' loans to the PALLAS Foundation bear a significantly lower interest rate, i.e. 1.5%. The complainant further states (see point 2) in recital (61)) that, by providing subsidised financing, the Dutch Government lowers the level of return that PALLAS needs generate to remunerate its capital, thus decreasing NewCo's LCUM ([174]) and allowing the

([172]) Full-cost Recovery for Molybdenum-99 Irradiation Services: Methodology and Implementation (oecd-nea.org), 2012.

([173]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the lifetime of the PALLAS programme).

([174]) The so-called 'levelised unit cost' (LCUM) measures the average net present cost of a unit of Mo-99 (i.e. a 6-day Ci) for a reactor, over its lifetime.

company to set a lower price to comply with the FCR principle, compared to a competitor that faces a higher cost of capital.

(250) Concerning the complainant's allegations summarised in recital (249), the Commission observes that, if the Dutch Authorities expected a market return for their investment, then there would be no State aid. This is why the present intervention is under the assessment of the Commission under the EU State aid rules. The Commission notes that, while the loans disbursed by the Dutch Government to the PALLAS Foundation in the period 2019-2024 carried a 1.5% interest rate, as described in recital (28) and highlighted by the complainant, the loans to be disbursed from 2024 onwards will bear a higher interest rate, as described in recital (31)1)c). This adjustment results in rates closer to the market rate, although still below, as these loans continue to constitute State aid. In addition, the Commission has conducted its own assessment of the market return that a typical investor would require for a project with comparable risk characteristics, as described in recitals (215) to (223). The Commission has verified the proportionality of the aid under these assumptions. Moreover, as described in recital (232), the Commission has conducted a sensitivity analysis based on the market return suggested by the complainant and has confirmed that proportionality is met under this scenario as well. Furthermore, the Commission considers that the Commitments proposed by the Dutch Authorities in the Trustee Mandate provide a reasonable reassurance that NewCo has no incentive to price below its full costs and that any deviation can be effectively remedied. The design of the Full Cost Coverage Commitment aims to ensure that, over every financial year, NewCo as a corporation (i.e. not at product level) will cover all costs associated with the PALLAS programme, including a reasonable return to the Dutch State. Moreover, the commitment to Full Cost Coverage aligns with the business plan to ensure that NewCo will not price below its full costs, while also ensuring that it is close to breaking even in its initial years of operation and continues to make profits while operating the PALLAS reactor.

(251) The complainant additionally argues (see point 3) in recital (61)) that a genuine FCR pricing should cover certain cost items.

(252) Concerning the complainant's allegation summarised in recital (251), the Commission observes that, as explained by the Dutch Government (see point b) in recital (132)), the business case for the PALLAS project foresees a far-reaching FCR model, or FCC ([175]), whereby the prices charged by NewCo for the PALLAS products and services will reflect in particular the following costs: preparation phase ahead of the construction of the reactor, licensing, regulatory changes, insurances and taxes, location and ground costs, all regular operational

([175]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the life time of the PALLAS programme).

expenses (personnel, fuel, maintenance, overhead, utilities, etc.), refurbishments, financing, depreciation, security, radioactive waste management, decommissioning. This is a far-reaching FCR model in that it covers costs that are often not reflected in the prices charged by other reactors for their medical isotopes ([176]), meaning that the prices for the PALLAS isotopes will likely be higher than average market prices. In any case, a comparison of the above-listed costs (covered by the PALLAS FCR model) with the cost items mentioned by the complainant as necessary elements of a genuine FCR pricing shows that the latter are covered by the PALLAS FCR model. Indeed, the FCC proposed by the Dutch Authorities in the Trustee Mandate foresees the effective coverage over every financial year, by NewCo as a corporation (i.e. not at product level), of all the following costs:

A. All the costs typically associated with the production, marketing and commercialisation of the PALLAS products, whether directly or indirectly (via depreciation and amortisation of capitalised amounts) expensed into the corporate profit and loss statement of the company. All provisions, but in particular those for the costs associated with the future decommissioning of the PALLAS reactor, should also be included.

B. All the costs that were incurred prior to the Commercial Operating Date and that are directly related to the PALLAS programme. In that context, such costs will need to be taken into account in the full cost coverage verification to be performed by the Trustee through an adjustment (e.g. an allocation/depreciation of those costs over the useful life of the PALLAS reactor or any other relevant process) to the periodic corporate profit and loss statement established by the company.

C. All the costs related to the financing of the construction and operation of the PALLAS reactor and related commercial activities, such as the interest charges (whether expensed or accrued) on the debt capital provided to NewCo and an amount corresponding to either i) the dividends paid by NewCo to the providers of the equity capital or, in case of no dividend payment, ii) a reasonable remuneration of such equity capital.

(253) Moreover, the complainant considers (see the last sentence of point 3) in recital (61)) that a genuine FCR pricing by PALLAS should ensure the allocation of costs to the irradiation of specific medical isotopes: the percentage of costs to be charged to medical isotope customers should take into account the fraction of thermal neutrons needed for the irradiation of those products in relation to the total number of thermal neutrons used for other products and services.

(254) Concerning the complainant's allegation summarised in recital (253), the Commission observes that, as explained by the Dutch Government (see point c) in recital (132)), there is still no international consensus on how to allocate costs to

([176]) An example of this is decommissioning. Depending on the country where the reactor is located, the responsibility for decommissioning costs is subject to different national regimes, ranging from full responsibility of the government to full responsibility of the reactor operator. As mentioned above, according to the FCR model adopted for the PALLAS project, decommissioning costs will be borne by NewCo and reflected in the prices of the products and services provided by PALLAS. Another such example is the costs for the radioactive waste management.

individual products and services, as it is difficult to develop a consistent and auditable model for such a cost allocation: the majority of the cost components are not driven by the specific products and services, and do not scale with the volume of these products and services, but they are common costs of the infrastructure relating to e.g. fuel, cooling, staff, financing, decommissioning, etc. Many countries participating in the OECD-NEA HLG-MR have therefore confirmed that such common costs of the infrastructure – if at all reflected in the prices – are typically allocated on the base of the turnover related to the products and services, and not on the base of the amount or volume of the products and services. This means that the common market practice consists in implementing FCR at the company level, not at the level of individual products and services. In addition, allocating costs to specific irradiation positions is made problematic by the variety of the possible utilisation scenarios over time, the difficulty in counting neutrons and the interference between various positions within the core of the reactor. This is why the FCR model designed by the Dutch Government for the PALLAS project, i.e. the FCC ([177]), follows the abovementioned market practice, whereby FCR is implemented at the company level, not at the level of individual products and services.

(255) Finally, the complainant states (see point 4) in recital (61)) that the Dutch Authorities might want to pursue public policy objectives rather than operate PALLAS in compliance with the FCR principle, especially if it turns out that market prices for medical isotopes are lower than PALLAS's FCR-compliant prices.

(256) Concerning the complainant's allegation summarised in recital (255), the Commission observes that, under Dutch law, a State-owned business such as NewCo is required to charge at least the integral cost for its goods and services (see point e) in recital (132). This law is enforced by the ACM which is an independent authority empowered to investigate any violation thereof and, in case of violation, is empowered to impose fines until the State-owned business ensures compliance. In addition, the Commission observes that the Dutch Government will appoint a Trustee, which shall be tasked with monitoring the implementation by NewCo of the FCR principle as of the commercial operating date of the PALLAS reactor (see point f) in recital (132)). The Commission therefore considers that there are sufficient guarantees that NewCo will implement the FCR principle.

(257) Based on the assessment in recitals (241) to (255), the Commission concludes that the aid in favour of the PALLAS project will only have limited effects on competition and trade.

([177]) The Commission considers that the "Full Cost Coverage Commitment", or FCC, proposed by the Dutch Authorities in the Trustee Mandate is substantively in line with the FCR principle, which (as indicated on page 8 of the OECD-NEA Guidance Document proposing an FCR methodology) allows taking into account national specificities. Therefore, the present Commission Decision, when discussing NewCo's obligation to identify and recover "*all relevant costs*" (as required by the OECD-NEA Guidance Document), refers to this specific "Full Cost Coverage Commitment", and not to the FCR principle as such. This approach ensures legal certainty and aims at avoiding that the commitments in the present Decision could be modified ex post, as several aspects of the FCR principle, which have not yet been definitively determined at OECD level, evolve in the future (over the life time of the PALLAS programme).

6.4.2.4. Weighing up the positive effects of the aid with the negative effect on the internal market

(258) As shown in recitals (175) to (184), the aid to the PALLAS project, besides facilitating the development of the production of medical radioisotopes, will have several positive effects for society at large and the Union as a whole.

(259) On the other hand, as shown in recitals (240) to (257), the aid to the PALLAS project will have limited impacts on competition and trade.

6.4.2.5. Conclusion on the weighing up exercise

(260) Based on the considerations in recitals (258) and (259), the Commission considers that the positive effects of the notified measures outweigh their potential adverse impact on competition and trade.

7. CONCLUSION

The Commission finds that the Netherlands has not observed the standstill obligation laid down in Article 108(3) TFEU and has unlawfully granted part of the notified measures. However, the Commission concludes that the aid, including the part unlawfully granted, is compatible with the internal market pursuant to Article 107(3), point (c), TFEU.

The Commission has accordingly decided not to raise objections to the aid in favour of the PALLAS project, on the grounds that it is compatible with the internal market pursuant to Article 107(3)(c) of the Treaty on the Functioning of the European Union.

If this letter contains confidential information which should not be disclosed to third parties, please inform the Commission within fifteen working days of the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to the disclosure to third parties and to the publication of the full text of the letter in the authentic language on the Internet site: http://ec.europa.eu/competition/elojade/isef/index.cfm.

Your request should be sent electronically to the following address:

European Commission,
Directorate-General Competition
State Aid Greffe
B-1049 Brussels
Stateaidgreffe@ec.europa.eu

Yours faithfully,

For the Commission

Margrethe VESTAGER
Executive Vice-President

CERTIFIED COPY
For the Secretary-General

Martine DEPREZ
Director
Decision-making & Collegiality
EUROPEAN COMMISSION

[...]

MONITORING TRUSTEE MANDATE

BETWEEN:

1. The Dutch State, represented by the Minister of Economic Affairs and Climate Policy (hereafter [***X***]), established at the Bezuidenhoutseweg 73, 2594 AC, The Hague

AND

2. [*Insert name, address, and, as the case may be, company details of the Monitoring Trustee*], (the "Trustee").

The Dutch State and the Trustee are hereafter referred to as the "***Mandate Parties***".

WHEREAS

In [PALLAS SA.103925 and SA.103926] and pursuant to State Aid Decision of [PM] of [PMdate] the Dutch State entered into commitments (the "***Commitments***"), attached hereto as [Annex PM], vis-à-vis the European Commission (the "***Commission***") with a view to achieve compatibility of the capitalization and financing of the PALLAS Programme with the internal market and the functioning of the EEA Agreement in line with article 107, paragraph 3, sub c, of the Treaty on the Functioning of the European Union.

The Commission approved the state aid for NewCo by its decision pursuant to Article 107, paragraph 3, sub c, TFEU (the "***Decision***"), subject to full compliance with the Commitments, which are included in the Decision as a condition for approval and attached to the present Mandate.

According to the Commitments the Dutch State undertakes to establish independent monitoring of the competitive behaviour by NewCo - when executing the PALLAS Programme - on the Union market(s) for medical isotopes by means of the appointment of the Trustee in addition to already existing legal frameworks and the financial covenants with NewCo. The monitoring and reporting of the Trustee will enable the Dutch State to demonstrate to the Commission that the Commitments are properly implemented and enforced through, among others, confirming that NewCo - when executing the PALLAS Programme - behaves in a commercially appropriate manner and does not implement predatory pricing strategies through e.g., cross-subsidization across commercialised isotopes because of its public funding.

The Trustee shall carry out the duties under this Mandate in accordance with a Work-Plan it has submitted during the selection process whereby it was selected as Trustee as well as any revision(s) of that Work-Plan, approved by the Commission.

On this basis, with the express approval of the Commission, the Dutch State undertakes to appoint a Trustee in the period between a year before the Commercial Operating Date of the PALLAS Programme and the Commercial Operating Date of the PALLAS Programme for the monitoring of the compliance of NewCo with the Commitments, included in the Decision and annexed to the present Mandate as Annex 1, which the Dutch State has provided to the Commission to ensure normal competitive and commercial behaviour by NewCo when executing the PALLAS

Programme. In accordance with the Commitments, the Dutch State hereby engages the Trustee and this agreement forms the mandate referred to in the Commitments (the "***Mandate***").

IT HAS BEEN AGREED AS FOLLOWS:

Section A. Definitions

1. Terms used in this Mandate shall have the meaning as set out below:

Commercial Operating Date: the date the PALLAS Programme will be executed and will first produce isotopes which are marketed and sold to commercial clients.

Decision: the Commission's decision pursuant to Article 107, paragraph 3, sub c, TFEU, *SA* [PM] of [PM date] not to object the state aid for the PALLAS-project.

Market segments: any combination of a product and geographic dimension where competition conditions are homogeneous and where NewCo is active when executing the PALLAS Programme. For the purpose of the present Mandate, the following Market segments have been identified:

i. Diagnostic isotopes (unprocessed);
ii. Therapeutic isotopes (unprocessed);
iii. Diagnostic isotopes (processed into radio chemicals or radiopharmaceuticals in the PALLAS facilities);
iv. Therapeutic isotopes (processed into radio chemicals or radiopharmaceuticals in the PALLAS Programme facilities);
v. Industrial isotopes.

An approximation of the geographic dimension will be given for each Market segment in the Trustee reports. This list may change from time to time due to market evolutions and/or changes in NewCo's commercial strategy when executing the PALLAS Programme. The Dutch State shall ensure that NewCo has properly informed the Trustee in case of such a change, at the latest by the time it has become effective.

NewCo: the legal entity whose shares are held by the Dutch State, and which executes the PALLAS Programme.

Normal competitive and commercial behaviour: the behaviour of a normal market economy operator which, in particular, does not implement predatory pricing strategies through e.g., cross-subsidisation across product segments because of its public funding.

PALLAS Programme: the production of isotopes at the PALLAS-reactor, the marketing and sale of those isotopes to commercial clients, the activities of the Nuclear Health Centre.

Trustee Partner Firms: the other firms belonging to the same organisation of individual partnerships and/or companies as the Trustee.

Trustee Team: the person or group of persons, all and individual independent from the Dutch State and NewCo or any of its affiliated undertakings, responsible for carrying out the tasks assigned by this Mandate and identified in Section D.

Work-Plan: the outline of the work-plan submitted to the Dutch State prior to the result of the competitive selection procedure and as communicated by the Dutch State to the Commission before the approval of the Trustee and attached hereto as [Annex PM].

Section B. Appointment of the Trustee

2. The Dutch State hereby appoints, in line with the results of the competitive selection procedure, the independent Trustee to monitor compliance with the Commitments regarding the normal competitive and commercial behaviour by NewCo when executing the PALLAS Programme and report to both the Dutch State and the Commission. The Trustee accepts the said appointment in accordance with the terms of this Mandate.

3. The appointment and this Mandate shall become effective on the date of signature by both Mandate Parties hereof.

4. The Trustee Team shall consist of the following key person [keypersons]: [*name and title of each of the key persons (partners/leading persons)*]. The Trustee shall not replace the members of the Team without prior approval of the Dutch State's Minister of Economic Affairs and Climate Policy and the Commission.

Section C. General Duties and obligations of the Trustee

5. The Trustee shall act on behalf of the Commission to allow the Dutch State to ensure NewCo's compliance with the Commitments and assume the monitoring duties specified in the Commitments. The Trustee shall carry out the duties under this Mandate in accordance with the Commission's Decision and with the Work-Plan as well as revisions of the Work-Plan, approved by the Dutch State and the Commission.

6. The Trustee will, prior to providing any report or recommendation to the Commission or the Dutch State consult NewCo to confirm (the completeness of) the facts and figures used by the Trustee for its report or recommendation.

7. The Trustee shall recommend to the Dutch State such measures as the Trustee considers necessary to ensure NewCo's compliance with the Commitments following prior consultation with the Commission.

8. The Trustee shall provide to the Commission, sending the Dutch State a confidential copy and sending NewCo a non-confidential copy at the same time, a written report within thirty (30) days after the approval by the external auditor of the annual accounts but no later than six (6) months after the end of each financial year in relation to the implementation of and compliance with the Commitments.

9. The Trustee shall promptly report in writing to the Commission and to the Dutch State, if it concludes on reasonable grounds that NewCo is failing to comply with any feature of the Commitments.

10. The Commission may, on its own initiative or on the basis of a report of the Trustee order the Dutch State to undertake measures to ensure compliance with the Commitments. The Trustee shall only receive instructions from the Commission.

11. If the Trustee, based on his monitoring activities, considers that the Commitments are not properly implemented and/or complied with, the Trustee may recommend the execution of one or more of the Remedies identified in the present Mandate (the "***Remedies***") to the Commission

and the Dutch State. In the event that the Commission approves the recommendation of the Trustee, or any variation thereof, following possible consultation with the Trustee, the Dutch State will be responsible for the implementation of the relevant Remedies under the supervision of the Commission. The Trustee shall monitor the execution of the Remedies and report on this in accordance with paragraph 18.

Section D. Duties and obligations of the Monitoring Trustee

D.1. Monitoring the Commitments

12. The Trustee oversees the competitive and pricing behaviour of NewCo in conformity with the Commitments. To that end, the Trustee shall in particular:

(a) Monitor and verify, at the end of every financial year:

(i) financial forecasts used for audit purposes (for impairment testing of the facilities);

(ii) the effective coverage over every financial year, by NewCo as a corporation[1], of all of the costs associated with the PALLAS Programme by the revenues generated from the commercialisation of the various isotopes into the various market segments where NewCo is active (the "***Full Cost Coverage Commitment***"). In that context, costs must be understood as:

- All costs typically associated with the production, marketing, and commercialisation of the PALLAS Programme's products whether directly or indirectly (via depreciation and amortisation of capitalized amounts) expensed into the corporate profit and loss statement of the company. All provisions, but in particular those for the costs associated with the future decommissioning of the PALLAS-reactor, should also be included;
- all costs that were incurred prior to the Commercial Operating Date and that are directly related to the PALLAS Programme. In that context, such costs will need to be taken into account in the full cost coverage verification to be performed by the Trustee through an adjustment (e.g., such as an allocation/depreciation of those costs over the useful life of the PALLAS-reactor or any other relevant process) to the periodic corporate profit and loss statement established by the company;
- all costs related to the financing of the construction and operation of the PALLAS-reactor and related commercial activities such as the interest charges (whether expensed or accrued) on the debt capital provided to NewCo and an amount corresponding either to i) the dividends paid by NewCo to the providers of the equity capital or, in case of no dividend payment, ii) a reasonable remuneration of such equity capital;

(iii) that the following process will be followed in order to provide the relevant information to the Trustee in order to comply with the Full Cost Coverage Commitment:

- The complete set of Audited and Certified Financial Statements of NewCo, audited and certified by the auditors appointed by NewCo's Board of Directors ("the Financial Statements of NewCo") will be provided to the Trustee within 5 working days. In case, due to unforeseen circumstances, an Audited and Certified Financial statement is not available, Newco will provide the financial statements to the Trustee no later than six months after each financial year. The

[1] That is, not at product level.

Audited and Certified Financial Statements of NewCo will be drawn up in compliance with Dutch GAAP or IFRS.

- Necessary adjustments in respect of the monitoring of the Full Cost Coverage Commitment ("the annual adjustments") will be made and included in a Full Cost Coverage Statement in order to account for the inclusion of the annual portion of the (full) costs incurred prior to the actual commencement of the commercial operation of the PALLAS Programme i.e., in the years 2019 to 2032 (i.e., non capitalised portion of the 'CAPEX' related to the PALLAS Programme, operational expenditures (if any) and non-capitalised interest charges) which will be provided to the Trustee. The Full Cost Coverage Statement will be audited and certified by NewCo's auditors and provided to the Trustee ultimately within 30 days after the provision of the Financial Statements of NewCo. The Trustee shall agree with the auditors appointed by NewCo's Board of Directors and agree upon procedures with respect to the audit of the elements of the Full Cost Coverage Statement.
- A pre-agreed detailed list of the relevant cost natures (based, among others but not exclusively on the Financial Model provided by the Dutch authorities to the Commission) will be included in the annual adjustments.
- The cost of equity will be included in the above-mentioned list of costs and to reflect, on an annual basis, a reasonable and adequate return for the Dutch State's equity investment in NewCo. The cost of equity will be based on the benchmark provided by the Dutch State when acting as an equity investor in State-owned companies, the "target return" (in Dutch: normrendement) as included in the Policy for State-owned enterprises).[2]
- The complete set of Audited and Certified Financial Statements of NewCo as well as the Full Cost Coverage Statement as audited and certified by the auditors appointed by NewCo's Board of Directors will be provided to the Trustee for the purposes of the verification of NewCo's compliance with the Full Cost Coverage Commitment as included in the Commission's Decision and will be the result of the combination of the Financial Statements of NewCo with the annual adjustments (both as described above).

(iv) the internal pricing policies applied by NewCo when executing the PALLAS Programme for the different isotopes produced by NewCo, where possible accompanied by a comparison with the pricing policies applied by other irradiators (in Europe and relevant third countries); and

(v) if the marketing, pricing and investment policies of NewCo are based on market principles, where possible accompanied by a comparison with the marketing, pricing and investment policies applied by other irradiators (in Europe and relevant third countries).

(b) In the event the monitoring and verification as described above is insufficient to ensure compliance with the Full Cost Coverage Commitment the Trustee may verify at the same time as and in the context of the above:

[2] It is understood and agreed upon as permissible between the European Commission and the Dutch State that by applying this point, a technical breach will most likely occur in the early years following COD of the PALLAS-reactor (probably first 2 years of operations) regarding Full Cost Coverage with regard to the cost of equity due to the long term nature of this project and required ramp-up post COD, among others. Historical unachieved returns do not lead to adjustments in the annual target return.

(i) the contents of the contracts of NewCo with the largest clients or a representative sample of contracts;
(ii) the process through which NewCo closes a contract;
(iii) the commercial terms of a contract, and;
(iv) based on the above, more specifically, request from NewCo, every financial year, a comparison of the evolution of the effective average prices NewCo will have charged its customers, over the last financial year, on each of the Market segments where NewCo is active, with the evolution of the average market price observed over that same period on each of the Market segments mentioned, to the extent this information is publicly available and/or can be sourced by the Trustee with or without the help of NewCo and/or advisors at the reasonable expense of NewCo, with the view to verify whether NewCo is generally not acting as a price leader on the Market segments (the "***No Lowest Price Leader Commitment***").

(c) Report to the Commission, with a confidential copy of the reports to the Dutch State, on the compliance of NewCo with the Commitments.

D.2. Imposing Remedies and Monitoring their Execution

13. If the Trustee, based on his monitoring activities, considers that, over a period of minimum 12 months, the Commitments are not properly implemented and/or complied with, the Trustee may recommend to the Commission and the Dutch State, the execution of one or more of the following Remedies:

(a) In the case the Trustee concludes that the net profit level (following the process described in point 12 (a) (iii)) of NewCo is in breach of the proper implementation of the ***Full Cost Coverage Commitment*** at company level for a full financial year or for a period of at least 12 months (consecutive or not, even if they overlap 2 financial years), the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedy and notifying it to the Commission for a new approval:

the interest paid by NewCo on its loans from the Dutch State will be increased by a punitive interest, in addition to the existing and agreed upon interest rate, to be proposed by the Trustee for the period during which NewCo will be considered to be in breach of the Full Cost Coverage Commitment with regard to one or more loans provided by the Dutch State in such a way as to increase the need of NewCo for sufficient revenue. The punitive interest rate will increase the costs for NewCo at least to the amount NewCo should have additionally calculated to its clients in line with the ***Full Cost Coverage Commitment,*** on top of the revenue amounts actually charged to those customers.

(b) In the case the Trustee concludes that NewCo is in breach of the proper implementation of the ***No Lowest Price Leader Commitment*** for a period of at least 6 months over the last 12-month period (consecutive or not, even if they overlap 2 financial years) on any of the various Market segments, the Trustee informs the Commission and recommends the Dutch State to amend the measure by imposing the following remedies and notifying it to the Commission for a new approval:

(i) […]

(ii) […]

[…].

14. In the event that the Commission approves, in writing, the recommendation of the Trustee, or any variation thereof, following possible consultation with the Trustee, the Dutch State and/or NewCo, the Dutch State shall:

    a. In case of a recommendation pursuant to paragraph 13, subparagraph a, apply article 6 of the Dutch State Aid Recovery Act and;
    b. in case of a recommendation pursuant to paragraph 13, subparagraph b, under i), […]; and
    c. in case of a recommendation pursuant to paragraph 13, subparagraph b, under ii) […].

15. In consultation with the Commission and the Dutch State, the Trustee may consider that NewCo is in compliance with the ***No Lowest Price Leader Commitment*** even if it were failing to meet the test of that Commitment if and only if NewCo can justify its failure to meet the Commitment over any relevant period as a result of (i) properly justified non-predatory volume-based rebates claimed by customers over the period, (ii) force majeure such as a sanitary/supply crisis, or (iii) a supply shortage due to the lack of capacity to meet the required demand on one or more of the various Market segments where NewCo is active, or (iv) any other particular reason(s) cleared by Trustee (ideally in advance of commercialisation). The applicability of any and all of the above exceptions are always subject to the review and formal approval (or rejection) of the Commission.

D.3. Rights of the Trustee in Performing the Mandate

16. When performing the above duties, the Trustee shall have the following rights vis-à-vis NewCo, its officers and personnel:

(a) The management board of NewCo shall keep the Trustee informed as to the implementation of, and compliance with, the obligations deriving from the Commitments, in particular regarding the ***Full Cost Coverage*** as well as the ***No Lowest Price Leader Commitment***;

(b) Every year, the Trustee shall receive a periodic report on the implementation of, and compliance with, the obligations deriving from the Commitments, in particular regarding ***Full Cost Coverage Commitment*** as well as the N***o Lowest Price Leader Commitment*** from the management board;

(c) The Trustee shall have the right to request to attend (when considered necessary), which will not be unduly withheld and speak at all meetings of the Audit Committee and the Supervisory Board;

(d) The Trustee shall not have the right to vote nor the right to be counted in the quorum. The Trustee shall however be entitled to propose items on the agenda of the meetings held by the Audit Committee and/or Supervisory Board in relation with its task and duties;

(e) The Trustee shall receive copies of the relevant documentation of the Audit Committee and the Supervisory Board in the same manner and at the same time as the members of the Audit Committee and the Supervisory Board. Aside from these communications, the Trustee will receive all other information deemed relevant by the Management Board;

(f) The Trustee shall have the right to meet with the Management Board in advance of all meetings of the Audit Committee and the Supervisory Board in order to prepare for such meeting and receive any information necessary for the performance of its task and duties;

(g) In respect of the other committees of the Supervisory Board, the Trustee may request to attend meetings of these committees, to the extent relevant in carrying out its duties.

Section E. Reporting obligations

17. After thirty (30) days of the approval by the external auditor of the annual accounts but no later than six (6) months after the end of each financial year or as otherwise agreed with the Commission, the Trustee shall submit a written report to the Commission (the "***Report***"), sending to the Dutch State a confidential copy at the same time as well as a non-confidential version to NewCo.

18. The Report shall cover the Trustee's fulfilment of its obligations under the Mandate and the compliance of Dutch State with the Commitments and, more particularly, all the topics listed under paragraph 12 above with the view to assess and conclude on the effective compliance by NewCo to the Commitments entered into by the Dutch State.

    The Report may contain recommendations about how the implementation of the topics listed under paragraph 12 above may be improved and, as a result, how compliance with the Commitments may become more effective.

19. When applicable, a confidential version of the Report will be presented to the Dutch State before the Annual General Meeting of the Company where the annual accounts are approved and adopted as well as the discharge of the executive board members is decided.

20. A confidential version of the Report of the Trustee will be provided to the Dutch State's Parliament and may therefore become public. A non-confidential version of the Report may become public.

21. If the Trustee considers that an intermediate report is needed because of a significant breach of the NewCo's compliance with the Commitments, the Trustee may issue such a report or some advice to the Commission with a confidential version to the Dutch State.

Section F. Duties and obligations of the Dutch State and NewCo

22. The Dutch State shall provide and shall cause NewCo to provide the Trustee with all such cooperation, assistance and information as the Trustee may reasonably require to perform its tasks. This includes, but is not limited to, the powers and rights listed in Section D, paragraph 12.

23. NewCo shall provide and – as the case may be the Dutch State – the Trustee with all managerial and administrative support that it may reasonably request.

24. The Dutch State and its officials shall in conformity with legal obligations laid down in Dutch law not divulge any and all commercially sensitive information received from the Trustee – including the confidential report – to NewCo and/or its employees nor make that information public unless ordered to do so by a court decision.

Section G. Trustee related provisions

G.1. Conflict of Interests

25. The Trustee, the Trustee Team and the Trustee Agent Partner Firms shall disclose current relationships with NewCo and Affiliated Undertakings in [Annex PM]. On this basis, the Trustee confirms that, as of the date of this Mandate, the Trustee and each member of the Trustee Agent Team is independent of NewCo and Affiliated Undertakings as well as of the Dutch State and has no Conflict of Interest.

26. The Trustee undertakes not to create a Conflict of Interests during the term of the Mandate. The Trustee, the members of the Trustee Team and Trustee Partner Firms may therefore not during the term of this Mandate:

    a. have or accept any employment by or be or accept any appointment as Member of the Board or member of other management bodies of NewCo or Affiliated Undertakings other than appointments pertaining to the establishment and performance of the Mandate;

    b. have or accept any assignments or other business relationships with or financial interests in NewCo or Affiliated Undertakings that might lead to a Conflict of Interests;

    c. have or accept any other appointments, assignments or other business relationships that may, in view of the circumstances of the particular case, be regarded as impairing the Trustee's objectivity and independence in discharging its duties under the Mandate.

27. Should the Trustee, the Trustee Partner Firms or members of the Trustee Team wish to undertake an assignment, business relationship or investment that may reasonably give rise to a Conflict of Interests, such a person shall seek the prior approval of the Commission and the Dutch State. Should the Trustee become aware of a Conflict of Interests, the Trustee shall promptly inform the Commission and the Dutch State of such Conflict of Interests. In the event that the Dutch State becomes aware that the Trustee or the Trustee Partner Firms have or may have a Conflict of Interests, the Dutch State shall promptly notify the Commission and the Trustee of such Conflict of Interests. Where a Conflict of Interests occurs during the term of the Mandate, the Trustee undertakes to resolve it immediately. Where the Conflict of Interests cannot be resolved or is not resolved by the Trustee in a timely manner, the Mandate may be terminated in accordance with paragraph 36 below.

28. The Trustee, the Trustee Partner Firms or members of the Trustee Team shall be prohibited from communicating any information relating to this Mandate to any other of the Trustee's personnel, except for information of a general nature (e.g. Trustee's appointment, fees accounting, etc.), and except for information whose disclosure is required by law.

G.2. Remuneration

29. [PM will be inserted after the selection procedure]

30. The Trustee shall be remunerated by the Dutch State in such a way that it does not impede its independence and effectiveness in fulfilling the Mandate.

G.3. Indemnity

31. The Dutch State shall indemnify the Trustee and the members of the Trustee's Team and hold each Indemnified Party harmless against liabilities resulting from the fulfillment of the Mandate, except to the extent that such liabilities result from the willful default, recklessness, gross negligence or bad faith of the Trustee and the members of the Trustee's Team.

G.4. Confidentiality

32. The Trustee and the members of the Trustee Team shall treat and protect all information and communication received from NewCo and the Dutch State as confidential information.

33. The Dutch State will be entitled to disclose any confidential information it receives in relation to, or for the purposes of, this Mandate to the European Commission, General Accounting Office or the States-General in accordance with the obligations laid down in the Dutch Constitution and relevant legislation.

Section H. Termination of the Mandate

34. This Mandate may only be terminated under the conditions set out in paragraphs 35-37.

H.1. Regular Termination of the Mandate

35. This Mandate shall terminate automatically if the Dutch State is no longer either a shareholder or a creditor of NewCo.

H.2. Termination of the Mandate before the Discharge

36. The Dutch State may only terminate the Mandate before the discharge of the Trustee in case of a Conflict of Interests that could not resolved in a timely fashion. The termination shall be subject to the approval of the Commission.

37. The Trustee may only terminate the Mandate for good cause, by giving written notice to the Dutch State and the Commission. The Trustee shall continue to carry out its duties under this Mandate until it has effected a full handover of all relevant information to a new Trustee approved by the Commission on the proposal of the Dutch State pursuant to the competitive procedure laid down in the Commitments.

H.3. Surviving Provisions

38. Paragraphs 31 – 33 shall survive the termination of the Mandate.

Section I. Additional Provisions

I.1. Amendments to the Mandate

39. This Mandate may only be amended in writing. The Mandate Parties agree to amend this Mandate if required by the Commission, after consultation with the Mandate Parties, in order to secure compliance with the Commitments, in particular if the amendment is necessary in order to adapt this Mandate to amendments of the Commitments.

I.2. Governing Law and Dispute Resolution

40. This Mandate shall be governed by and construed in accordance with Dutch civil law.

41. In the event that a dispute arises concerning the Mandate Parties' obligations under this Mandate, such dispute shall be submitted to the non-exclusive jurisdiction of the District Court of The Hague.

I.3. Notices

42. All notices sent under this Mandate shall be made in writing and be deemed to have been duly given if served by personal delivery upon the party for whom it is intended or delivered by registered or certified mail, with request of return receipt, or if sent by fax, upon receipt of oral confirmation that such transmission has been received, to the person at the address set forth below :

    If to the Minister of Economic Affairs and Climate Policy, addressed as follows: [·] If

    to the Minister of Health, addressed as follows:

    [·]

    If to the Trustee, addressed as follows:

    [·]

    If to the Commission, addressed as follows:

Or to any such other address or person as the relevant party may from time to time advise by notice in writing given pursuant to this section. The date of receipt of any such notice, request, consent, agreement or approval shall be deemed to be the date of delivery thereof.

[*Indicate place and date*] By:
Title:

By:
Title:

Annex [·]

Disclosure of current relationships between the Trustee, the Trustee Team and the Trustee Partner Firms and NewCo and Affiliated Undertakings.

Annex [·]

Annex [·]

EUROPEAN COMMISSION
DIRECTORATE-GENERAL
ENVIRONMENT
Compliance, Governance & Support to Member States
Environmental Compliance – Implementation

Brussels
ENV.E.2/ [redacted]

[redacted]
On behalf of Mobility for the Environment

[redacted]
On behalf of Grootouders voor het Klimaat

[redacted]

Subject: Your letter to Commissioners Sinkevičius and Hoekstra on nitrogen in the Netherlands

Dear [redacted],

On behalf of Commissioners Sinkevičius and Hoekstra, I would like to thank you for the letter of 1st of February 2024, sent on behalf of 'Grootouders voor het Klimaat' (Grandparents for Climate) and Mobility for the Environment (MOB).

In the letter you express your concerns over the state of the Dutch nature as a consequence of high levels of deposition of nitrogen. This is also recognised at political level, as is clear from the letter of Minister van der Wal of 31 August 2023 to the Dutch parliament[1], in which she states that studies show that, on the one hand, total deposition of nitrogen is higher than previously calculated and that, on the other hand, the critical deposition value for 32 out of 81 habitat types is to be set at a lower level than currently, as the habitats may already deteriorate at lower level of nitrogen deposition. More recently, the Minister for Nitrogen underlined the need for action in another letter to the Dutch Parliament of 23 January 2024[2].

The Dutch courts have been asked, among others by MOB, to ensure the correct application of EU nature legislation as regards the impact of nitrogen deposition on protected sites which are sensitive to nitrogen deposition. Relevant cases are still pending, including one started by Greenpeace in summer 2023[3]. National courts are indeed responsible for the correct application of EU law at national level and the competent Dutch courts are fulfilling their role in the above context.

The Commission will continue to monitor the evolution of the state of nature in the Netherlands and the application of, *inter alia,* EU nature and water legislation. In this regard,

[1] Kamerbrief nieuwe kritische depositiewaarden en actualisatie depositiecijfers | Kamerstuk | Rijksoverheid.nl
[2] Kamerbrief over voortgang aanpak piekbelasting | Kamerstuk | Rijksoverheid.nl
[3] See: Waarom Greenpeace een rechtszaak voor de natuur start (en tegen het trage stikstofbeleid) | Greenpeace Nederland - Greenpeace Nederland

we will also continue to provide guidance and technical support to the Dutch authorities to ensure full compliance with EU law, without prejudice to any enforcement action that the Commission may consider in the future.

Yours sincerely,

Electronically signed

[redacted]

Head of Unit