Draft Climate, Energy and Environmental protection Aid Guidelines (CEEAG)

SolarPower Europe reply

Introduction

State aid has a critical role to play to drive the deployment of clean energy technologies needed to put Europe on track for achieving climate-neutrality by 2050 and realize a true Green Deal for European citizens.

The competitiveness of clean and renewable technologies compared to conventional solutions is still hampered by continuous public support to fossil or unsustainable alternatives or by the limited pricing of negative environmental externalities in the current European economy. **In this regard, we highly welcome the stronger language of the proposed CEEAG with regards to fostering competition between technologies on the base of their contribution to the overarching target for net CO2 emission reduction, as the Union's primary environmental objective. The introduction of binding commitments on Member States to define concrete measures avoiding the lock-in of fossil-based or CO2 emitting technologies, as well as the displacement of cleaner technologies, is also a true game changer.**

The **'Fit for 55' package presented by the European Commission in July 2021 raises the EU renewable energy target from 32% to 40% by 2030**. To this end, Europe needs to massively ramp up the use of renewables-based electricity, as the most cost-effective and energy efficient way to deliver CO2 emissions reduction across the European economy. The deployment of battery storage solutions as well as the production of renewable-based hydrogen will be critical to support a more flexible and integrated energy system and achieve the full decarbonation of hard to abate sectors such as aviation and shipping.

Although clean technologies as solar PV, battery storage or electrolysis, have achieved important cost reductions in the past decade, public support remains critical to deploy the technologies at scale across European countries with various levels of ambition and uneven regulatory frameworks. On the one hand, public support (e.g in the form of Contracts for Difference) acts as

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a necessary remuneration insurance for project developers, against the volatility of electricity market prices and the uncertainty of future flexibility services remuneration, for project developers to invest. On the other hand, public support granted through technology-specific tenders creates the right conditions for the deployment of dedicated technologies with high social, economic, industrial or environmental benefits. This also needed for innovative technologies with a strong potential for driving the energy transition further, such as agrisolar or floating that allow for a sustainable use of land, or renewable hydrogen. **In this regard, we welcome the further flexibility granted to member states in defining the right frameworks to reach their Union targets, such as the renewable energy target. Such flexibility must be translated by explicitly allowing members states to conduct hybrid auctions or avoiding too prescriptive approaches in the use of selection criteria.**

1 Key recommendations on the proposed revision of the EEAG

While the following documents lays out SolarPower Europe's detailed feedback on the proposed revision for the Energy and Environment state aid guidelines, we would like to highlight the following key points of concern:

1. We support the proposed new framework for State Aid, which intends to foster competition between technologies on the base of their contribution to the overarching target for CO2 emission reduction. It may however strengthen the interactions between State aid and the EU ETS mechanism. **For projects not covered by specific targets, where the main driver for decarbonisation is CO2 pricing, granting state aid can distort the EU ETS price signal and trigger a situation of quota oversupply.** This contradicts the provisions highlighted in point 69. To avoid this, ETS quotas equivalent to the CO2 emission reduction achieved through the aid should be cancelled or transferred to the stability reserve. This is particularly relevant for future state aid to fossil-based hydrogen production, or the decarbonisation of industrial processes.

2. **The proposal to expose large rooftop PV projects to competitive bidding processes from 400 kW as of 2022 and 200 kW as of 2026 will put at a serious risk the potential of the commercial and industrial solar PV market.** Competitive bidding processes create important administrative burdens and increase uncertainty, creating an investment barrier for owners of large rooftops. The introduction of tenders from such a low threshold has already shown detrimental effects on the solar rooftop market in countries like France or Germany, creating a missed opportunity to install renewables on available rooftops areas, and further decarbonize EU businesses. **We strongly recommend increasing the competitive bidding process threshold to 3 MW, while continuing to implement robust claw-back or cost monitoring mechanisms to avoid overcompensation (point 92). Alternatively, a specific state aid framework could be developed for commercial and industrial rooftop installations, which size may vary between 30kw and above the MW size.**

3. **The proposed definition of "energy from renewable sources" (point 18.34) puts at risk the development of hydrid solar and storage projects and prosumer projects**. According to the definition, renewable electricity produced and stored behind the meter and later consumed or reinjected in the grid would lose its renewable electricity rights, such as the support scheme or the Guarantee of Origin on the MWh. This would put a halt to the development of solar and storage business models which are essential to support a more integrated and flexible energy system and rely on the possibility to be used for several services at the same time, as envisioned by the Market Design Directive (Art 15 MDD) to [illegible]

4. **Achieving climate-neutrality requires a stronger approach to ensure that state aid is prioritized towards the most future proof and sustainable technologies avoiding investments into carbon emitting or fossil-based technologies which may become stranded assets or displace investments into cleaner technologies as detailed in point 108**. SolarPower Europe recommends (i) prioritizing supports towards project that deliver a net and significant reduction of CO2 emission reduction, by establishing a “minimum threshold for net CO2 emission reduction” conditional to receiving state aid, and (ii) ensuring that binding commitments from Member States to mitigate or avoid the lock-in of fossil-based technologies or displacement into cleaner technologies are clearly defined and monetized, so that they can be factored in the price of the bid (point 108).

5. **Aid to energy and environmental performance of buildings must incentivise technologies making buildings a net clean energy producer.** Buildings can contribute to climate-neutrality not only by reducing the energy demand, but also by producing clean electricity reducing the system’s CO2 footprint. Rooftops represent a massive, unused potential for solar energy development, which could power one quarter of the EU’s electricity demand. Yet, today, renovation aid is focused on the reduction of building’s primary energy demand. It must evolve and be granted based on both the additional reduction of primary energy demand of the building and the contribution of the building to GHG emissions reduction, by incentivising investment into decentralised clean energy generation (point 118).

6. **State aid support for blending hydrogen with natural gas into the gas network should be approached with caution.** It promotes the use of hydrogen in final uses for which other more effective and efficient decarbonisation options already exist (such as electrification in buildings) and locks-in technologies using gaseous fuels with limited decarbonisation potential. **We therefore call for stronger safeguards on the eligibility of gas infrastructure projects, to avoid investments in stranded assets (point 339).**

7. The EU objectives of the European Green Deal and of an open and strategic autonomy make the case for redeveloping a strong solar PV value chain in Europe, from manufacturing to installation. **To do so, power-intensive PV manufacturing will require access to cost-competitive and clean electricity to be on a level-playing field with competitors.** The rules for granting aid to energy intensives must therefore allow to provide globally competitive conditions for manufacturers. In particular, the level of aid should not be too strictly limited for exceptionally power-intensive industries (points 360 to 362). In addition, the green conditionalities attached to the aid and unrelated to the competitiveness objectiveshould not result into lowering the efficiency of the aid, for instance by imposing too stringent requirements on industrial users where appropriate regulatory frameworks are not fully developed (point 365).

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2 General considerations (category 4.1)

2.1 Public consultations obligations should not come at the expense of further administrative burdens or endanger public acceptance (point 85 to 88)

It is important that relevant stakeholders are appropriately consulted when defining an aid scheme at national level and when evaluating the compatibility of such schemes with EU competition law at EU level. Feedback from stakeholders is critical to better inform the Commission's competition decision, and to ensure a strict compatibility with the EU's competition rules. The Commission already has means do to so, through a direct consultation to companies or during the investigation period.

Nevertheless, we are concerned to see a too stringent public consultation obligations on renewable energy schemes only, while other State aid schemes including for polluting activities outside of the energy sector (transport, agriculture) are exempt from such requirements. This may lead to creating further administrative burdens or slow down the development of renewable energy support schemes, thus the transition to climate-neutrality.

We would therefore request clarification on the impact of the €150 million threshold for the estimated average annual aid in relation to renewable electricity support schemes.

In addition, the proposed consultation period is disproportionate for renewable energy support schemes and might result into delays of implementation. We would therefore suggest reducing the proposed consultation period to 2 to 3 weeks for support to renewable energy.

2.2 Transparency requirements on the subsidy per ton of CO2 equivalent emissions avoided must be aligned with EU methodologies (point 98)

We welcome the further transparency on the cost efficiency of the aid related to the CO2 emissions reductions. Nevertheless, **this indicator must be taken with caution.** In the short-term, it may favor conventional solutions which may prove more cost-efficient in the short-term to reduce CO2 emissions, yet locking-in fossil-based capacities (in the case of CCS based hydrogen) or displacing investments in cleaner and most cost-efficient technologies in the long run. It also fails to grasp the long-term potential of innovative technologies (floating solar, agrisolar or renewable hydrogen).

In addition, measures that provide a fully carbon-neutral solution are hardly comparable with those that just represent a partial decarbonisation (e.g. CCS/U with an efficiency lower than 100%), which will require in the future further actions to achieve a comparable result as requested in point 108. In a way, measures that provide a carbon-neutral solution (such as renewable electricity or hydrogen) are bidding upon a (full) decarbonisation costs whereas the full cost of measures delivering just a partial decarbonisation will only fully defined and monetized in the future (e.g. cost of complementing a CCS/U with the employment of a certain proportion of biogas / biomethane in order to deliver a carbon neutral solution). To avoid this distortion, **comparability should be ensured between eligible costs. When granting state aid to projects providing partial decarbonization in the short-term, the bid should factor-in the**

cost of future measures required to abate the residual CO2 emissions, or phase-out residual fossil-fuel consumption as highlighted in point 108.

A common methodology should be established for accounting CO2 emissions reductions and should be in line with EU law. Regarding eligibility criteria for renewable hydrogen projects, the methodology for calculating CO2 content of clean hydrogen technologies (p. 98). should be consistent with the one already in use under Articles 25, 26, and 29 of the Renewable Energy Directive. In addition, only projects contributing to a net and <u>significant</u> reduction of CO2 emission should receive State aid. We propose to complement this proposal by introducing a "minimum CO2 emission reduction criteria" for eligibility, which would i) support prioritizing public funding towards projects with the highest impact on CO2 emission reduction and ii) enhance visibility for project developers on the type of projects eligible.

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Footnote 60 The principles for the calculation of greenhouse gas emissions reductions as used for the EU Innovation Fund provide a useful point of reference, available at [hyperlink]. **For hydrogen projects, the principles for the calculation of greenhouse gas emissions reductions should be based on Articles 25, 26, and 29 of the Renewable Energy Directive.**

The longer the economic lifespan of a transitory measure providing partial decarbonisation, the greater its negative effect in the longer-term. In addition, the longer the lifespan, the stricter the binding commitments to be required to the Member State / beneficiary to render the measure compatible (see point 108). This negative effect should be considered when assessing the eligibility to state aid.

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65. State aid for environmental and energy objectives may have the unintended effect of undermining market rewards to the most efficient, innovative producers as well as incentives for the least efficient ones to improve, restructure or exit the market. This may also result in inefficient barriers to the entry of more efficient or innovative potential competitors. In the long term, such distortions may stifle innovation, efficiency and the adoption of cleaner technologies. These distortive effects can be particularly important when the aid is granted to projects that provide a limited transitory benefit but lock out cleaner technologies for a longer term, including those necessary to achieve the medium-term and long-term climate targets enshrined under the European Climate Law. This can, for example, be the case for support to certain activities using fossil fuels that provide an immediate reduction of green house gas emissions, but lead to slower emissions reductions in the long term. All other things being equal, the closer the aided investment is in time to the relevant target date**, and the longer its economic lifespan,** the greater the likelihood that its transitory benefits may be outweighed by the possible disincentives for cleaner technologies. The Commission will therefore take into account these possible short and long term negative effects on competition and trade in its assessment.

2.3 The reorganization of State Aid for Energy and Environment around the key objective of CO2 emission reduction should not create a distorsion on the ETS price signal. (category 4.1)

We support the proposed new framework for State Aid, which intends to foster competition between technologies on the base of their contribution to the overarching target for CO2 emission reduction.

For projects not covered by specific targets, where the main driver for decarbonisation is CO2 pricing, granting state aid can distort the EU ETS price signal and trigger a situation of quota oversupply. This contradicts the provisions highlighted in p. 69. To avoid this, ETS quotas equivalent to the CO2 emission reduction achieved through the aid should be cancelled or transferred to the stability reserve.

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Footnote 51. This could also be the case where the aid distorts the operation of economic instruments put in place to internalise such negative externalities, **(**for example, by affecting price signals given by the Union ETS or a similar instrument**)**. **In these cases, ETS quotas equivalent to the carbon emission reduction achieved through the aid should be cancelled/transferred to the stability reserve.**

2.4 Claw-back or cost-monitoring mechanisms must prevent overcompensation as well as retroactive changes (point 53)

The level of aid granted to renewables outside of competitive bidding processes must evolve over time to avoid overcompensation. At the same time, **changes on the level of aid should not negatively affect the rights conferred to the beneficiary and undermine the economic viability of projects that already benefit from support**, in line with the Renewable Energy Directive article 6. This is particularly the case for the CAPEX-intensive solar PV technology, which requires certainty on the remuneration to unlock investment at a competitive financing costs. Retroactive changes on the aid level, as recently introduced in France, Czech Republic, Greece or Slovakia, undermine the investors' trust on remuneration certainty and must be avoided in the future.

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53. Where a competitive bidding process is not used and future developments in costs and revenues are surrounded by a high degree of uncertainty and there is a strong asymmetry of information, the Member State may be required to introduce compensation models that are not entirely ex ante. Instead, these models are a mix of ex ante and ex post or introduce ex post claw-back or cost monitoring mechanisms, while keeping incentives for the beneficiaries to minimise their costs and develop their business in an efficient manner over time. **Such mechanisms and their methodologies must not be changed retroactively or result in changes in the aid level where it negatively affects the rights conferred to the beneficiary or undermine the economic viability of projects that already benefit from support.**

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3 Aid to renewable electricity (category 4.1)

Solar PV has achieved important cost reduction in the past years and is now primed to become a critical pillar of the future carbon-neutral energy system. Solar PV is the cheapest electricity source in most world regions according to the IEA, reaching 29 to 42 USD/MWh. According to the 2020 IEA World Energy Outlook, "Solar PV is consistently cheaper than new coal- or gas fired power plants in most countries, and solar projects now offer some of the lowest cost electricity ever seen."

This gain of competitiveness offers new opportunities to deploy more solar PV projects without public subsidies in the near term. However, public support will remain essential to realise the energy transition of the EU.

On the one hand, public support acts as a necessary remuneration insurance for project developers to invest, as electricity markets and regulatory frameworks are progressively modernised. While solar projects are CAPEX-intensive, the electricity market provides an OPEX remuneration. Yet, the increased volatility of electricity markets prices, especially across the lifetime of the solar plants (20 years), impacts investor's long-term visibility and their ability to estimate revenues and return on investments. This uncertainty results in higher financing costs, which can represent half of the total project cost. Public support therefore acts as a de-risking mechanism (the Contract for Difference model complements the market price where the latter does not reach the strike price), allowing project developers to make investments.

On the other hand, public support is shaping the energy transition for the EU and will be needed to support the uptake of more innovative and costly clean energy technologies which can have a substantial contribution to the European Green Deal. Large-scale, ground-mounted solar PV projects break world-record cost competitiveness levels. Yet, some **smaller, more sustainable, or more innovative solar PV projects remain** structurally more expensive to develop. This is the case of:

- **Floating solar projects**[1] **and Agrisolar projects**[2] which **optimise land use and resource efficiency** and hold significant potential to deliver co-benefits supportive of European Green Deal objectives. Floating solar enables to install PV on unused water surfaces with lower lease costs, increase the efficiency of PV panels from cooling effect of water, reducing evaporation from drinking water reservoirs, or creating jobs in coal regions in transition as potential to deploy floating solar in disused coal mines is very high[3].Agrisolar allows an increased land-use and resource efficiency, the preservation of agricultural land, reduced water consumption, improved crop yields, potential to increase

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[1] Floating solar refers to the deployment of PV modules on floating structures over water surfaces.

[2] Agrisolar refers to the integration of solar photovoltaic projects within agricultural activities. Agrisolar projects must be based on sound agronomical, environmental, and socioeconomical analysis. For more information, see SolarPower Europe Agrisolar Best Practice Guidelines.

[3] Fraunhofer ISE (2020) Fraunhofer ISE Analyzes Potential of Solar Power Plants Located on Pit Lakes in Former Lignite Minesv

soil carbon sequestration, the provision of ecosystem services, and contributions to the socio-economic welfare of rural communities.

- **Rooftop PV projects or small- and medium-size projects** are more exepensive than utility-scale installations. Yet, there are typically developed by local project development companies and installed by local installers[4]. They are also more job intensive and have been identified by the Joint Research Center as a suitable economic prospect for workers coming from regions transitioning from coal or other polluting activities[5].

- **Solar projects using products with a low CO2 footprint** or with a higher degree of recyclability are contributing to increasing the sustainability of the solar PV industry along the full value chain.

- **Hybrid projects,** where solar PV is combined with wind or with battery storage, can supply a more dispatchable electricity facilitating their grid integration, and in the future could provide flexibility services to the network.

In purely price-based technology-neutral tenders, such technologies are not able to compete with the price trend set by mainstream projects and are therefore at risk not to be developed, despite their social, economic, or environmental benefits. This creates a missed opportunity to support projects with higher public acceptance, or stronger support to grid stability. **Public support has a critical role to correct this market failure and create the right conditions for the deployment of those projects, while still maintaining a competitive environment to keep costs down.**

[4] SolarPower Europe Job Study
[5] JRC study

3.1 A new approach to competitive bidding processes (points 49, 83, 90, 91)

We welcome the new approach proposed to competitive bidding processes for renewable electricity. Member states will need flexibility in the design of tenders to adapt to future system but also social needs as renewable become mainstream, in line with the Renewable Energy Directive article 6.

We understand the text allows for renewable tenders (point 83 (a)), innovative technologies tenders such as agri-solar specific or floating solar specific tenders (point 83 (d)), solar specific tenders in line with Directive (EU) 2018/2001 Art. 4 (point 83 (e)), as well as hybrid auctions or storage auctions (point 83 (f)). **We would however recommend making a specific reference to hybrid auctions as an example of schemes that can be allowed under point 83 (f).**

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83. The Commission will assess the reasons given as justification and will, for instance, consider that a more limited eligibility does not unduly distort competition where:
(a) a measure targets a specific sectoral or technology based target established in Union law, such as a renewable energy or energy efficiency scheme54;
(b) a measure aims specifically to support demonstration projects;
(c) a measure aims to address not only decarbonisation but also air quality or other pollution;
(d) a Member State provides evidence that eligible sectors or innovative technologies have the potential to make an important contribution to environmental protection and deep decarbonisation in the longer term, particularly in terms of cost effectiveness;
(e) a measure is required to achieve diversification necessary to avoid exacerbating issues related to network stability[55];
(f) a more selective approach can be expected to lead to lower costs of achieving environmental protection (for example through reduced grid integration costs), and/or result in less distortion of competition[55bis].

[55bis] **Such a more selective approach could be, for instance, the design of hybrid auctions coupling renewable and clean technologies such as battery storage likely to provide services to the energy system, currently or in the future.**

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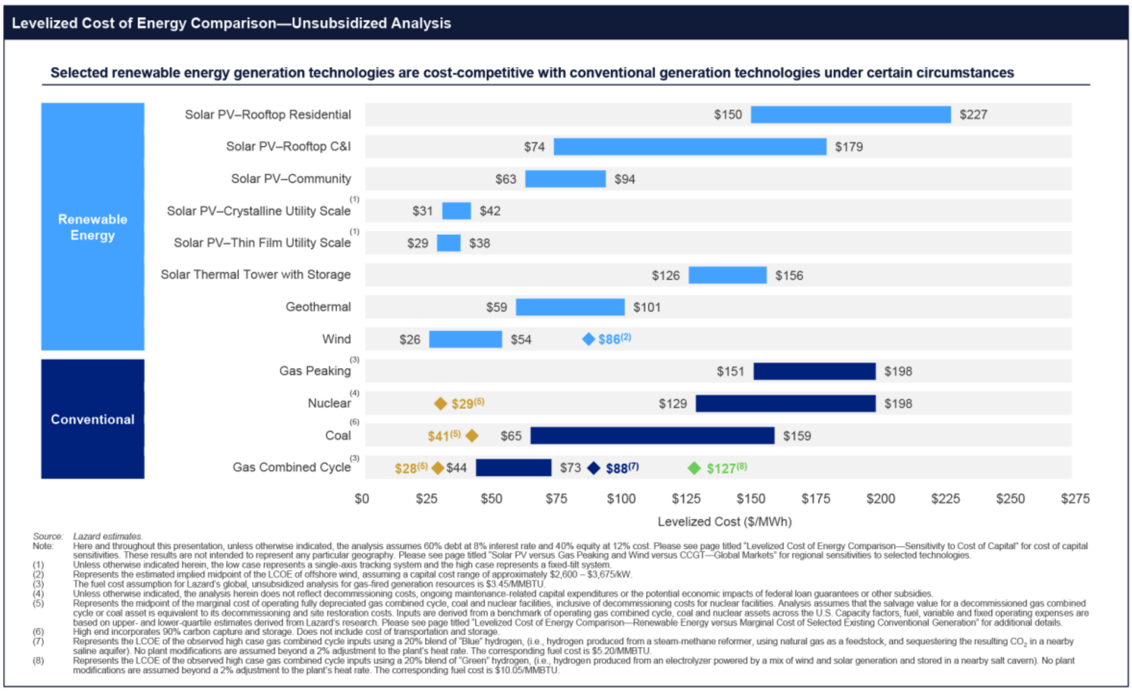
We also welcome the possibility to have segmented tenders for rooftop PV or smaller scale PV projects where the level of support for beneficiaries deviates significantly, as well as the proposed benchmark of 15 % difference on the project costs (points 90 and 91). Segmented tenders allow to develop a variety of projects sizes – such as rooftop PV or smaller ground-mounted solar PV projects, which are typically developed by local and smaller project developers. This allows to deploy a diversified mix of solar PV capacities in the system as well as allow smaller bidders to compete.

However, **we would welcome further clarification on how the cost delta will be evaluated (footnote 59)**. As a benchmark, the following costs for solar PV can be considered. According to our understanding, considering standard costs for rooftop PV of USD 150/MWh and for ground-mounted PV of USD 30/MWh the 15% cost difference could therefore be understood as:

The costs of rooftop PV (USD 150/ MWh) are 400% more important than the cost of groundmounted PV (USD 30/MWh)

The costs of groundmounted PV (USD 30/MWh) are 80% less expensive than rooftop PV (USD 30/MWh)



Source: Lazard Bank (2020). Levelized Cost of Energy 14.0

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We finally welcome the possibility to introduce a non-price selection criterion in competitive processes (point 49), but we recommend introducing more flexibility in the approach to ensure future-proof guidelines. Such criteria have been used to value the CO2 content of projects, the innovative character of project, the possibility for citizens to participate.

Rather than a tool for a few exceptional cases, we view such bonus criteria, particularly environmental criteria, as the future of tenders, which will allow to support ongoing efforts to improve the sustainability profile of photovoltaic systems in the EU and respond to societal expectations beyond prices.

They are successful and beneficial only if they are transparent, clearly defined, non-discriminatory, technology-neutral and not introduced or changed retroactively. They should be introduced in duly justified cases. They should also remain, at least in a first step, a bonus criterion, while the price of bids should remain the main selection criterion. However, defining a strict threshold of 25% is over prescriptive and would not contribute to making the CEEAG future-proof.

SolarPower Europe's amendment proposal

49. The selection criteria in the competitive bidding process should as a general rule be based on the aid amount requested by the applicant put in direct or indirect relation to the contribution to the objective of the measure (for example in terms of unit of environmental protection or unit of energy). ~~In a few exceptional cases,~~ **I**t may be appropriate to include other non-price selection criteria (for instance additional environmental, technological or social criteria). In such cases, such other criteria must **should constitute a bonus and price should remain the main criterion to select bids** ~~account for not more than 25 % of the weighting of all the selection criteria~~. The Member State must provide reasons for the proposed approach and ensure it is appropriate to the objective pursued.

3.2 Undersubscribed tenders must not lead to a decrease of public support to renewables but instead motivate the assessment, and where relevant modernisation of the state aid framework (point 48)

Undersubscription of tenders may take place for different reasons. Conjunctural factors, such as the COVID-19 pandemic, may create too important disruption or uncertainties for companies to form bids. Tenders may not be the appropriate aid allocation mechanisms for certain beneficiaries (for instance small-scale and rooftop PV projects, as in France). Projects may face regulatory barriers that do not allow them to realise further investments (for instance, administrative barriers).

Such situations should not lead to a halt the support to those renewables projects, resulting into a reduction or a cancellation of the budget allocated to the aid. Instead, this should be an incentive to postpone the allocation of the aid, as well as assessing, identifying and addressing the barriers in the competitive bidding process design itself or in the broader state aid framework.

3.3 Provisions to avoid speculative behaviors are necessary but must not create a barrier to entry to newcomers (points 48 and 101)

The introduction of a guarantee mechanism like in France, Germany or Spain, or the introduction of penalties for unrealised projects, should prevent speculative bidding. However, these mechanisms should be designed to avoid generating an additional barrier to entry for smaller players: for example, by setting guarantee or penalty levels too high. The introduction of project milestones, with realistic, concrete deadlines that must be respected by the developers could also ensure a better project realisation rate. When developers are not able to meet their obligations and build their projects, the volume of unrealised projects should be auctioned off during the next tender year.

3.4 Provisions on negative prices must not put at risk remuneration stability for renewables and result into barriers to investment (point 104)

While we acknowledge the issue of negative prices, the maximisation of sector coupling and incentives to flexibility, including incentives on end-users to absorb the oversupply of RES and developing a more complex and a wider range of balancing services, such as those developed by Ireland under the DS3 Programme or the UK, will be the key to address this issue in the medium-term.

In addition to such measures and until flexibility markets are mature, it may be necessary to limit state aid for beneficiaries during periods of negative prices. However, strong safeguards should be introduced to preserve the revenue certainty of project developers, which is essential to trigger investments into new projects. It can be addressed efficiently by a financial compensation for the outage work resulting from negative spot market prices, as it has been in the case in some countries: in France, aid is granted under negative prices in the limit of 15 hours/year; in Belgium, the Netherlands and Austria, aid is not granted for periods of 6 or more consecutive hours of negative prices; in Germany, the same applies for periods of 4 or more consecutive hours of negative prices. It should therefore be ensured that such safeguards are allowed under the State Aid guidelines.

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104. The aid must be designed to prevent any undue distortion to the efficient functioning of markets and, in particular, preserve efficient operating incentives and price signals. For instance, beneficiaries should remain exposed to price variation and market risk, unless this undermines the attainment of the objective of the aid. In particular, beneficiaries should not be incentivised to offer their output below their marginal costs and must not receive aid for production in any periods in which the market value of that production is negative **while not creating barriers to investment** [61bis][62]**.**

[61bis] **Barriers to investment can be created due to the uncertainty regarding the amount of periods in which the market value of production is negative. Safeguards should be allowed to avoid these barriers, for instance the introduction of a minimum period under which aid can be granted when the market value of that production is negative taking the day ahead and the intraday market price into account.**

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4 Aid to rooftop PV and prosumers (categories 4.1 & 4.2)

On-site generation such as rooftop solar PV prosumer business models, supports a climate-proof energy system integration by i) replacing energy generated from combustible sources and promoting the renewable-based electrification of end-uses such as buildings and road transport, ii) minimizing transportation losses and iii) enhancing the flexibility of the energy system through its collocation with battery storage systems. Distributing solar generation capacity also increases the resilience of the energy system, by ensuring electricity is generated where it is consumed.

Prosumers shouldn't be regulated as isolated components of the energy system, but instead as positive energy producers:

- Buildings represent an important surface for an efficient deployment of solar PV on already built surfaces. Deploying rooftop PV on buildings in the EU could generate between 680[6] and 1300 TWh[7] of electricity per year, providing clean electricity to power the energy system and end use sectors.
- Prosumers could provide valuable services for the grid by activating their demand flexibility potential, adapting their energy consumption or making distributed on-site batteries and electric vehicles available when needed.

What is the investment challenge for prosumers?

Costs are mostly capital expenditure.	**Generating revenues to offset financing costs** can be challenging:
• Prosumers do not have the capital available or face **important financing costs.** • **Split incentives**[8][9] – costs are spent by buildings owners / builders, revenues are earnt by consumers. Therefore, investments are not realized • **Prosumers are not renewable energy professionals** and have limited access to information and capacity to bear administrative burdens. As a result of this and challenges 1 and 2, the investment decision is challenging.	Consumers can save on the electricity bill by consuming self-generated electricity, but **some taxes on the self-generated electricity,** such as the renewable energy surcharge in Germany, hinder the business case. Consumers can be remunerated from injected electricity, including: • Feed-in Tariffs, which are not exposed to market signals and *do not create sufficient incentives for prosumers to provide flexibility services.* • Revenues from wholesale markets or from flexibility markets, which *are not yet adapted to small prosumers and not fully accessible to aggregators.*

[6] Joint Research Centre (2019) A high-resolution geospatial assessment of the rooftop solar photovoltaic potential in the European Union. https://www.sciencedirect.com/science/article/pii/S1364032119305179
[7] SolarPower Europe and LUT University (2020) 100% Renewable Europe. https://www.solarpowereurope.org/100-renewable-europe/
[8] Joint Research Centre (2017) Overcoming the split incentive barrier in the building sector. https://publications.jrc.ec.europa.eu/repository/bitstream/JRC101251/ldna28058enn.pdf
[9] Split incentives refer to the lack of fair and reasonable distribution of financial obligations and rewards related to energy efficiency investments among concerned actors, for example the owners and tenants of building units or the different owners or multi-apartment or multi-purpose buildings.

Public support must therefore (1) be accessible with proportionate burdens for rooftop owners, (2) facilitate investments into integrated renovations and (3) ensure competitive remuneration for self-generated electricity and the provision of flexibility.

4.1 Rooftop PV should be exempted from an obligation to go through competitive bidding processes until 3 MW (points 92 and 95), alternatively, a specific state aid framework should be developed for mid-size self-consumption installations

Similarly to buildings renovation, the first barrier to investment in rooftop PV, is often not necessarily the economics, but instead is related to non-financial barriers: the difficulty to access information, the length of the administrative process, etc., ending up discouraging the investor. Tenders represent such non-financial barrier for owners of rooftop PV.

For this reason, we strongly oppose the proposal to expand tendering processes to renewable energy projects from 400 kW as of 2022 and from 200 kW as of 2026 and to allow the exemption from competitive bidding processes for renewable energy projects below 3 MW.

Projects between 200 kW and 3 MW are usually projects installed on rather large rooftops, often owned by businesses.

Such projects often require a feed-in support to consolidate the business case where the electricity price or tax regime does not make self-consumption competitive enough (as in France) and because alternative sources of remuneration (flexibility markets) do not offer a competitive source of revenues.

In addition, some rooftops like agricultural warehouses are purely designed to become renewable energy producers, rather than consumers, either there is no electricity consumption attached to the rooftop or too little to make self-consumption possible.

Tenders are problematic for rooftop PV owners on different fronts.

They represent a **higher administrative burden** for rooftop owners. Tenders require candidates to evaluate their business case over a long-time span, fill in the required papers to submit the bid, then wait for several months for the award decision.

They **increase revenue uncertainty for rooftop PV owners**. At the time of investment, the owner is not sure he will obtain the support, and offset its financing costs or realise its business case. Whereas this can be borne by certain large companies, this is not the case for smaller companies, which are likely to disengage from this investment.

Case study: tendering schemes in Germany and in France

In Germany, a rooftop owner (an SME of 50 employees) is considering investing into rooftop solar PV installation, together with a plan for renovation of the rooftop, so that it is fit to support the installation of the solar panel. As the tender happens twice a year, the owner has to put the whole project (renovation + solar PV generation) on hold for half a year to fit for the timeline of auctions, if not a year if the bid is unsuccessful in the first auction. To develop the bid, the SME will not invest time and resources in gathering information and expertise for a once in a lifetime investment. It will have to contract with a consultant, which represents an additional cost. To minimise the costs, it will likely go to a national or multinational solar company offering cost-competitive services, against its regional engineering company.
For reference, see EuPD Research Sustainable Management GmbH, 'Auswirkungen der geplanten Ausschreibungspflicht'.

In the South of France, a local project developer (5 FTEs) estimates that going through a tender requires 5 times longer than going through an 'open counter' mechanism, due to the increased amount of paperwork required and due to the diversity of contact points involved (instead of one contact point for the open counter mechanisms – the DSO Enedis). In practice the project developer has to resort to a consultancy, resulting into an additional cost of 3 to 4€ on the electricity price of the project. In addition, the tender creates an uncertainty which makes it difficult to conduct commercial negotiations with buildings' owners. Altogether, the situation benefits larger, multinational project developers, likely to cope with the uncertainty and the additional costs.

As consequence, **rooftop PV owners will choose not to invest, or will undersize their installation** to go under the tender threshold. This is what happened in several members states:

- In France, the rooftop PV tender threshold for self-consumption support (Contract for Difference and premium) was lowered to 100 kW. Tenders were largely undersubscribed. The government then decided to increase the tender threshold to 500 kW.

- In Germany, for systems between 300 kW and 750 kW, rooftop owners have two options: either get a Feed-in Tariff through a funding gap approach or a Contract for Difference through tenders. The results of the first auction round (of the second approach) in July 2021 showed an important decrease of the market: the volume of bids was at 210 MW in the first round, which could result into a total ~400 MW in 2021 if the second auction has a similar result in the second round. This a lot lower than the total volume of 800 MW in 2020. In addition, the average size of projects in the July 2021 tender was 1.3 MW, showing that all the smaller projects were not able to compete in the tender.

Is the 400 kW / 200 kW double threshold appropriate?

Balancing responsibility and competitive bidding processes are two different requirements and it is not justified to use the same threshold for both topics.

The proposed 400 kW / 200 kW threshold come from the Electricity Market Design Regulation, article 5, which defines the type of installations which can be exempt from balancing responsibility. However, balancing responsibility, which is a responsibility which comes together with electricity market obligations.

Coping with electricity market realities, such as balancing responsibility or direct marketing (the obligation to sell the electricity on markets before receiving support scheme), require having access to a third party which can perform this service at a competitive cost for the owner of the rooftop. The availability of such service provider depends on the implementation of EU electricity market design rules and the openness of markets for aggregators. On the contrary, competitive bidding processes related to non-financial barriers prior to the investment and depend on the capacity of the rooftop PV owner to cope with uncertainty and administrative burdens when making investment decisions.

Will exemption to competitive bidding processes lead to overcompensation?

Competitive bidding processes are an appropriate mean to reveal the right costs of projects. However, the risk of overcompensation can be efficiently tackled through other means such as claw-back or cost monitoring mechanisms, through which the level of the aid is reevaluated regularly, for instance on the basis of electricity market prices.

SolarPower Europe's amendment proposal

92. Exceptions from the requirement to allocate aid and determine the aid level through a competitive bidding process can be justified where evidence, including that gathered in the public consultation, is provided that one of the following applies:

(a) there is insufficient potential supply to ensure competition; in that case, the Member State must demonstrate that it is not possible to increase competition by reducing the budget or expanding the eligibility of the scheme;

(b) beneficiaries are small projects, defined as follows:
(i) for electricity generation or storage projects – projects below ~~the threshold in Article 5 of Regulation (EU) 2019/943~~ **3 MW**;
(ii) for electricity consumption – projects with a maximum demand less than 400kW;
(iii) for heat generation and gas production technologies – projects below 400kW installed capacity.

4.2 Aid to energy and environmental performance of buildings should incentivise and provide the right conditions to investment into decentralised solar PV generation in the buildings (category 4.2).

4.2.1 Support scheme Key Performance Indicators (KPIs) should reflect the contribution of decentralised generation to climate-neutrality.

Buildings can contribute to climate-neutrality by implementing energy efficiency measures, reducing their total energy demand and related emissions. A recent study from GdW[10] has shown that building renovation measures focused solely on energy efficiency did not achieve expected energy consumption reductions, due to a rebound effect in consumption patterns.

To ensure building renovation measures contribute to reducing the emissions originating from buildings they must be combined with measures to drive the deployment of decentralised energy resources (DERs) such as solar and storage and facilitate buildings becoming active energy producers:

- Consumption of self-generated electricity (for example by a PV system on the roof) reduces the electricity consumption from the grid and allows for a reduction of the carbon intensity of the electricity consumption.
- Injection of self-generated electricity in the grid increases the integration of zero-carbon energy production in the grid and reduces the CO2 intensity of the energy system.
- Assets integrated in the building, such as the battery storage, the EV charging point, or other demand assets, can provide local flexibility services which will facilitate the integration of decentralised energy resources and of electrified end uses.

All these dimensions should be considered when tailoring state aid frameworks to energy and environmental performance of buildings. However, in the draft guidelines, aid for the improvement of the energy and environmental performance of buildings is only required to induce reductions of primary energy demand (energy efficiency perspective). This is a missed opportunity to consider the contribution of buildings to the decarbonisation of the energy system.

SolarPower Europe therefore recommends that:

(i) Renovation aid must be granted on <u>Building performance</u> improvements which include both the additional reduction of primary energy demand of the building <u>and</u> the contribution of the building to greenhouse gases emissions reduction.

The reduction of primary energy demand should account for the self-consumed zero-carbon electricity (which is deducted from the final energy demand of the building). The indicator used to assess the reduction of primary energy demand, used in the draft Guidelines and defined in the Energy Performance of Buildings[11] can, but does not

[10] GdW - Die Wohnungswirtschaftat in Deutschland (2020): Daten und Trends der Wohnungs- und Immobilienwirtschaft 2019/2020.
[11] EPBD 2010/31/EU Article 2.5: 'primary energy' means energy from renewable and non-renewable sources which has not undergone any conversion or transformation process.
EPBD 2018/844 Annex: The energy performance of a building shall be determined on the basis of calculated or actual energy use and shall reflect typical energy use

automatically include, the contribution of decentralised energy resources to the primary energy demand reduction. However, some member states already allow for such a calculation: the German Building Energy Act allows for 150kWh of energy consumption per kW of on-site solar installed capacity. When combined with storage, the value increases to 200 kWh per KW of on-site solar installed capacity. In systems without storage, up to 30% of the annual primary energy consumption may be deducted. Systems which combine solar and storage may deduct up to 45% of the annual primary energy consumption.

A new indicator on the contribution of the aid to reduce the Greenhouse gases emissions reduction of the buildings should be introduced, as made possible by the EPBD[12]. It should measure the annual greenhouse gas emission reduction per square meter of the energy used in the building and produced by the building and injected in the grid, expressed in kgCO_2eq/m2/year. Some member states already use his metric: in France the "Diagnostic de Performance Energétique" introduced a double rating system for energy performance of buildings, based on both primary energy demand and the annual GHG emissions from the building[13]. This methodology should however be improved to account for the GHG emissions reduction of the energy generated in the building and reinjected in the grid.

A methodology for the calculation of the GHG emissions reduction KPI of energy produced in the building and injected in the grid should be established. Such a methodology could be established according to the principle in the example below.

Case study: Calculating the GHG emissions reduction contribution of a building

Benchmark Business as Usual Building, considering a 100 sq. m residential building connected to the EU electricity mix (CO2 intensity of approx. 300 tCO2/GWh).
Total annual energy consumption (using EU averages): 200 GWh

Total CO2 intensity of the building is 60 ktCO2 over one year.

Energy performant Building (energy efficient and annual 45 GWh rooftop PV)
(1) Renovation reduces annual energy consumption by 10%, i.e total energy consumption is 180 GWh over one year.

(2) 2/3 of the rooftop PV production (including production stored and later self-consumed) is used for self-consumption, i.e 30GWh over one year. The total CO2 emissions of the energy consumption is (180-30)*300 = **45 ktCO2 over one year, avoiding 15 ktCO2 emissions**.

(3) 1/3 of the rooftop PV production (including production stored and later reinjected) is injected in the grid, i.e 15GWh over one year, avoiding GHG emission reduction. The building has avoided an additional **15*300= 4.5 ktCO2 emissions over one year.**

→ The GHG emissions reduction allowed by the aid is 19.5 ktCO2 over one year.

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for space heating, space cooling, domestic hot water, ventilation, built-in lighting and other technical building systems. (…) In the calculation of the primary energy factors for the purpose of calculating the energy performance of buildings, Member States may take into account renewable energy sources supplied through the energy carrier and renewable energy sources that are generated and used on-site, provided that it applies on a non-discriminatory basis.'

[12] EPBD 2018/844 Annex I 2a. "For the purpose of expressing the energy performance of a building, Member States may define additional numeric indicators of total, non-renewable and renewable primary energy use, and of greenhouse gas emission produced in kgCO 2 eq/(m 2 .y)."

[13] https://www.ecologie.gouv.fr/diagnostic-performance-energetique-dpe

Where it does not result into disproportionate administrative or financial burdens for end-users[14], member states should be encouraged to use a dynamic calculation of building performance measures. This would reflect the real-time contribution of buildings to decarbonisation and incentivise consumers to adopt smart behaviours and deploy innovative smart digital technologies, in line with the EU Energy System Integration Strategy. Such a calculation could measure, at hourly intervals, the amount (MWh) of renewable electricity generated and/or stored on-site that the building feeds into the grid, the amount (MWh) of renewable electricity from the grid that is consumed and/or stored by the building, and the carbon content of the grid (GHG) at any services. given time[15]. Google's 24/7 Carbon-Free Energy Methodology is a good example of how to measure the impact of using GHG-free energy on an hourly basis[16]. This requires the provisions by system operators of adequate real-time data GHG intensity data of the energy grid.

It should be allowed to couple energy performance of buildings with aid not limited to storage systems used *only* for self-consumption, but instead open to storage systems which could be used to provide needed demand-side flexibility services. Storage systems have a value that goes well beyond the only support self-consumption but can instead optimise grid connection by flattening generation or provide grid services.

4.2.2 Incentives should be provided for integrated renovations, ensuring energy efficiency improvements are combined with the deployment of on-site renewable energy and flexibility assets.

Integrated energy renovations are complex undertakings that require a wide variety of interventions to reduce energy consumption, deploy DERs, and drive the smart electrification of energy end-uses such as heating, ventilation and cooling, or transport. To realise their projects, building owners and residents must often finance projects with sometimes uncertain future savings, engage with multiple service providers, and face technical regulatory considerations[17].

As a result of this complexity, renovations are either undertaken in a single stage, wherein the entire set of interventions are executed together, or in several stages which take place over several years. In the latter case, individual energy performance improvements may have lower payback period than five years, while still contributing to reduce the overall energy and environmental impact of the building.

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[14] Administrative and financial burdens could be disproportionate reporting obligations or unavailability of affordable metering systems.
[15] As proposed in Article 1(10) of 2021/0218 (COD) Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652.
[16] Google. "24/7 Carbon-Free Energy: Methodologies and Metrics" https://www.gstatic.com/gumdrop/sustainability/24x7-carbon-free-energy-methodologies-metrics.pdf
[17] EIT-ClimateKIC (2021). How blended finance can catalyse building renovation. https://www.climate-kic.org/wp-content/uploads/2021/05/White-Paper-How-Blended-Finance-Can-Catalyse-Building-Renovation-EIT-Climate-KIC-2021.pdf

SolarPower Europe therefore recommends that:

(i) The payback period for projects should be estimated on the entire package of renovation interventions. Interventions to electrify buildings such the installation of heat pumps, taken alone, can have a payback period shorter than 5 years, which could make these ineligible for support according to the current guidelines. Alternatively, member states could consider different payback times depending on the type of measures considered.

(ii) Aid for the energy performance of building should be coupled not only with investments for charging infrastructure or for improving the smart readiness of buildings but **should also cover investments support also of charging stations (V2G)**.

4.2.3 The aid must be designed to meet the specific needs of different building sector segments and address the challenge of split incentives.

Non-residential buildings can decarbonise at a lower cost due to larger economies of scale, among other factors. Integrated renovations of non-residential buildings on average lead to higher energy performance improvements and GHG emission reductions than residential buildings[18].

Residential buildings face more important barriers to investment than non-residential building. They are usually financed with own capital, while non-residential building renovations are more often financed with external capital[19].

In line with the Renovation Wave Strategy, we therefore recommend that aid level and design is adapted to the specificities of building sector segments and income levels of the building owners or tenants. **Member states should be able to provide full financing to vulnerable households to avoid negative distributional effects stemming from high upfront investment requirements**. Aid intensity for small scale renovations should be 100% of the eligible costs, particularly for the residential building sector.

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[18] JRC (2019) Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU. https://op.europa.eu/en/publication-detail/-/publication/97d6a4ca-5847-11ea-8b81-01aa75ed71a1

[19] Ibid.

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116. This aid may be combined with aid for any or all of the following measures:
(a) the installation of integrated on-site renewable energy installations generating electricity, heat or cold;
(b) the installation of equipment for the storage of the energy generated by on-site renewable energy installations **and for the provision of demand-side flexibility to the electricity grid**;
(c) the construction and installation of recharging infrastructure for use by the building users, and related infrastructure, such as ducting~~,~~ and **smart inverters**, where the car park is located either inside the building or it is physically adjacent to the building;
(d) the installation of equipment for the on-site digitalisation of the building, in particular to increase its smart readiness. Eligible investments may include interventions limited to passive in-house wiring or structured cabling for data networks and, if necessary, the ancillary part of the passive network on the private property outside the building. Wiring or cabling for data networks outside the private property is excluded;
(e) other investments that improve the energy or environmental performance of the building, including investments in green roofs and equipment for the recovery of rain water.

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118. The aid must induce:

(a) in the case of renovation of existing buildings, energy performance improvements leading to a reduction in primary energy demand of at least 20 % **and at least [XX]% GHG emission reduction,** as compared to the situation prior to the investment. By way of derogation, where the improvement is part of a staged renovation, the latter must lead to an overall reduction in primary energy demand of at least 30 % as compared to the situation prior to the investment, over a period of 3 years;

(b) in the case of new buildings, energy performance improvements leading to at least 10 % of primary energy savings **and [XX]% of GHG savings** compared to the threshold set for the nearly zero-energy building requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council[65].

(c) in the case of integrated renovations which include the installation of integrated on-site renewable energy installations generating electricity, heat or cold, and/or the installation of equipment for the storage of the energy generated by on-site renewable energy installations; the amount of on-site energy generated and/or stored shall be deducted from the primary energy saving requirement in (a) and (b).

**

119a. Aid for the improvement of the energy performance of buildings may also be granted for projects which incentivise smart prosumer behaviour to abate GHG emissions through the self-consumption, storage, and injection into the grid, of on-site renewable electricity.

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121. The Commission considers that, in principle, aid to projects with a payback period of less than five years does not have an incentive effect. However, the Member State may provide evidence to demonstrate that aid is needed to trigger a change in behaviour, even in the case of projects with a shorter payback period. **The five-year payback period shall be estimated on the entirety of interventions needed to reach the required building performance improvement, not on the payback time of each specific intervention.**

4.3 Aid to prosumer projects should ensure appropriate remuneration, considering the limited modernization of electricity markets and competitiveness of aggregators models (category 4.1).

4.3.1 Feed-in support to electricity injected in the grid is still necessary to realise the prosumer business case and to ensure prosumers can also support decarbonisation of the energy system.

The current text prevents *flat* Feed-in Tariffs above 400 kW as of 2022 and above 200 kW as of 2026, which instead will have to either (i) receive *variable* Feed-in Tariffs or (ii) sell electricity on markets before receiving support.

First, although the self-consumption business model (maximising the consumption of electricity self-produced behind the meter) is developing, it should be highlighted that **feed-in support remains important to develop the rooftop PV market**. First, self-consumption schemes do not always provide a sufficient business case for all consumers, for instance residential consumers that have a limited capacity for self-consumption (average self-consumption levels without storage at 30%). In addition, relying on self-consumption only leads consumers to undersize their installation, creating a missed opportunity for the deployment of renewables on unused rooftop surfaces. Supporting the feed-in also reflects the contribution of prosumers to the decarbonisation of the energy system.

In addition, **the obligation to go through direct marketing for smaller projects might be at the detriment of local and small- and medium-sized project developers**. Those project developers face higher barriers to develop projects based on direct marketing. The volatility of electricity market prices as well as the unpredictability of future negative prices events create an important uncertainty on the total project revenue, with which SMEs are less likely to deal due to their lower information level on market dynamics. In addition, concrete and competitive aggregation services are not always available for decentralised generation.

Therefore, **we recommend conducting a thorough impact assessment before introducing a phase out of Feed-in Tariffs and an obligation to go through direct marketing for smaller solar PV generation, in particular assessing the impact on SMEs**. In particular, direct marketing should not be mandatory where prosumers cannot access a third party service provider at a competitive price.

4.3.2 As electricity and flexibility markets are not fully developed, prosumers equipped with solar & storage must retain for the electricity self-produced and stored, the rights entitled to renewable electricity.

Prosumers have a real potential to support the flexibility of the energy system, as digital technologies coupled with battery storage systems allow them to react to market signals.

Yet, today many obstacles remain to this theorical model: electricity and flexibility markets are not fully open to storage and to aggregators, local flexibility markets where prosumer's flexibility could be valued are not yet fully realised, double taxation of storage still puts it at a competitive disadvantage with other flexibility sources.

Consequently, stored renewable electricity cannot be fully economically valued in electricity and flexibility markets today. Stored and reinjected renewable electricity should therefore retain its “rights” and access feed-in support, to reflect its societal value (future potential for flexibility provision, optimisation of grid connection needs, etc.).

Such a renewed support should not lead to greenwashing but strictly focus on *renewable* electricity stored and later reinjected. Thanks to submeters and digital technologies, which are likely to become common practice as homes electrify, renewable electricity stored and reinjected can be easily traced.

➔ For more information, see the following section 4 “Aid to energy storage”.

5 Aid to energy storage (category 4.1)

Energy storage technologies, and in particular battery storage, will play an important role in the functioning of the future, renewable-based electricity system, as recalled by the Energy System Integration Strategy[20]. Energy storage will allow the further integration of new large- and small-scale solar PV projects in grids and markets, providing alternative sources of revenues to project developers. It will provide critical sources of clean flexibility services to compensate for the variability of renewable generation and of an increasingly electrified demand. It will finally support the technical functioning of the electricity grid in systems with limited or no thermal generation and allow for a large-scale penetration of renewables.

Yet, the current text of the draft Climate, Energy and Environmental protection Aid Guidelines threatens the development of co-located solar and storage projects in the EU. Indeed, under our interpretation, the current definition of energy storage in point 18 (34) does not allow electricity produced from renewable energy sources, stored in a battery storage behind the meter and later reinjected behind the meter or in the grid to be qualified as renewable energy, and therefore lose its right for support and its traceability (Guarantee of Origin).

> *(34) 'energy from renewable sources' means energy produced by plants using only renewable energy sources as defined in Article 2, point (1), of Directive (EU) 2018/2001 of the European Parliament and of the Council31, as well as the share in terms of calorific value of energy produced from renewable energy sources in hybrid plants which also use conventional energy sources and includes renewable electricity used for filling storage systems connected behind-the-meter (jointly installed or as an add-on to the renewable installation), but excludes electricity produced as a result of storage systems;*

We are highly concerned by this proposal, and would propose a clarification of the guidelines, for the reasons below.

5.1.1 This definition is not in line with the Electricity Market Design Directive (EU) 2019/944 below.

According to this definition, energy storage stresses a delay in consumption *of the same energy* to a later point, without the energy losing its renewable quality.

*(59) 'energy storage' means, in the electricity system, **deferring** the final use of electricity **to a moment later than when it was generated**, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier;*

[20] COM(2020) 299 final - Powering a climate-neutral economy: An EU Strategy for Energy System Integration

5.1.2 Renewable electricity stored should retain access to renewable energy support schemes, to maintain the business case for solar PV and storage until electricity markets develop.

Energy storage collocated with solar PV can improve the business case of solar PV plants, reducing or refocusing the need for public subsidies. First, it improves the market remuneration of solar PV by making it more flexible: solar and storage can perform price arbitrage on electricity markets (storing when electricity prices are low and reinjecting when electricity prices are high) or by providing flexibility services on markets[21]. Second, it allows solar PV projects to save on grid costs, with benefits for the public infrastructure costs. For instance, coupling of a solar plant with battery storage allows to undersize the grid connection necessary to connect the project, reducing the associated connection fees. In the case of a prosumer, battery storage allows increasing the self-consumption rate and therefore the amount of kWhs on which the prosumer can save taxes and grid fees.

Yet, **in practice, electricity markets and regulatory frameworks are not fully adapted to storage and the business case of solar PV and storage is facing several obstacles**:

- Electricity and flexibility markets designs are not fully adapted to storage and to aggregators of decentralised battery storages, not allowing these producers to sell services.

- Electricity and flexibility markets design are not putting battery storage at a level playing field with other technologies (for instance, not valuing its capacity for a very fast response), not allowing storage to fully value its services.

- Markets particularly suitable for prosumer storage, such as markets for decentralised flexibility (i.e flexibility used in certain area of the grid by distribution system operators) or non-frequency ancillary services markets, are simply not existent and should be developed in the coming ten years.

- Due to unsuitable taxation rules, battery systems remain subject to double taxation, which put them at a competitive disadvantage with other sources of flexibility. In addition, where double taxation is prohibited, it comes with additional burdensome conditions, such as the installation of too expensive equipment (industrial meters) resulting into a concrete financial barrier to entry to prosumers.

Until electricity markets are fully modernised, regulatory frameworks are adapted and affordable technical solutions are found, renewable electricity when stored cannot find a proper remuneration on markets – see case studies below.

A loss of the "green quality" for stored electricity would consequently hamper even further the market remuneration of stored renewable electricity, contradict the Market Design Directive and lead to more dependence on subsidies in most European markets.

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[21] Grid-intelligent solar report

Case study 1 – prosumer solar and storage

Sources of revenues for a prosumer are threefold:

A. Taxes and fees exemption on the kWhs when RES-E is consumed behind-the-meter immediately or stored and consumed later behind-the-meter
B. Revenues from the injection of the renewable electricity on the network, generally benefitting from public support for small-scale projects (Feed-in Tariff or Feed-in Premium on top of the electricity market price)
C. Revenues from price arbitrage on electricity markets or balancing services when the solar PV electricity is stored and later injected on the grid

According to the current definition, solar PV electricity produced and later consumed behind the meter would not be considered renewable and not be eligible to access taxes and fees exemptions (A) nor to Feed-in Tariff / Premium when injected in the grid (B). The only revenue possible is therefore from markets (C). Yet, as demonstrated earlier, electricity and flexibility markets are not fully developed and do not constitute a good source of revenues for the prosumers. As a consequence, prosumer would tend not to use their battery storage, but instead undersize their solar PV system to satisfy a low rate of self-consumption.

Maintaining access to stored solar electricity to support scheme on the contrary would incentivise consumers to use their battery to increase their self-consumption level, provided that the remuneration A remains more attractive than remuneration B. Prosumers would also not be disincentivised to do demand side flexibility, as they will still receive price signals through their electricity bill. In addition, prosumers would not be incentivised to undersize their installations and will use their full rooftop surface to develop solar PV projects

Case study 2 – large-scale solar and storage plants

The sources of revenues of the project are threefold:

A. Revenues from the injection of the renewable electricity on the network, either benefitting from public support (Feed-in Tariff or Feed-in Premium on top of the electricity market price) or under a Power Purchase Agreement, based on the electricity market price
B. Revenues from price arbitrage on electricity markets or balancing services when the solar PV electricity is stored and later injected on the grid
C. Possible savings on the grid connection cost if the storage system is used to undersize the grid connection contract compared to the solar PV plant capacity

According to the current definition, solar PV electricity produced, stored and later reinjected in the grid would not be considered renewable and not be eligible to public support (A). The only revenue possible is therefore from markets (B), which are not fully developed yet, and the possible savings on the grid connection (C). As revenue A is likely to be higher than revenue C, project operators would tend to inject electricity in the network without storing it and without providing a dispatchable renewable electricity feed-in.

Maintaining access to stored solar electricity to support scheme on the contrary would incentivise project operators to use their battery to provide a dispatchable renewable feed-in, and optimise their grid connection allowing them to oversize the solar park. It would also allow for a large-scale deployment of a parc of solar and storage which could in the future provide key flexibility services.

5.1.3 Renewable electricity stored should retain access to the Guarantee of Origin to enable renewable corporate sourcing schemes or renewable hydrogen production projects.

Guaranteeing the traceability of renewable electricity is critical as Europe's economic system electrifies. This is the basis for renewable Power Purchase Agreements contracts, where corporates buy renewable electricity from a solar plant over long term periods, unlocking private investments into additional capacities. This is also critical to allow for renewable electrolytic hydrogen, where a baseload electricity supply could come from a co-located solar storage plant supplying electricity either through a direct line or a Power Purchase Agreement.

5.1.4 Metering and tracing of renewable electricity can be ensured where necessary, in order not to lead to overcompensation or greenwashing.

Member States can take appropriate measures to avoid overcompensation or greenwashing. For instance, solar and storage directly connected to a consumption point (direct line PPA, self-consumption). In addition, in some auctions or regulatory frameworks, and although this is not the ideal case, it is strictly forbidden for a co-located battery together with solar PV to charge from the grid – this is the case of the hybrid auction taking place in Germany. In such case, the inverter is programmed to do unilateral injection of electricity in the grid. In other cases, many solutions exist to trace renewable electricity and are being defined now by energy regulators.

**

The guidelines should ensure that the "green quality" of renewable electricity isn't lost simply because that electricity is stored in a co-located battery, or the co-located battery happened to also charge from the grid to provide other services that are valuable to the efficient, safe and reliable operation of the system.

SolarPower Europe's amendment proposal

(34) 'energy from renewable sources' means energy produced by plants using only renewable energy sources as defined in Article 2, point (1), of Directive (EU) 2018/2001 of the European Parliament and of the Council31, as well as the share in terms of calorific value of energy produced from renewable energy sources in hybrid plants which also use conventional energy sources and includes renewable electricity used for filling storage systems connected behind-the-meter (jointly installed or as an add-on to the renewable installation) **and the deferral of the final use of this renewable electricity to a moment later than when it was generated**~~, but excludes electricity produced as a result of storage systems~~;

6 Aid to hydrogen production (category 4.1 and 4.3)

Concerning renewable hydrogen, Solar Power Europe is providing feedback to the draft guidelines on State Aid for CEEAG 2022 in the areas of production and mobility.

6.1.1 The CEEAG must allow for technology specific tenders for Renewable Hydrogen (category 4.1)

Member states must have the possibility to issue technology-specific tenders for renewable hydrogen, to achieve the targets established by the European Hydrogen Strategy.

We acknowledge that only technologies for which costs and level of support are similar can compete with a level playing field in the same auction: this is likely to be very relevant for clean hydrogen technologies where the costs of renewable-based hydrogen solutions will be higher in the short-term, compared to electricity-based and fossil-based low-carbon hydrogen production. **Further clarity should be given to the industry on whether the 15% cost delta (p.90) is considered as the general rule for including or excluding technologies from a specific auction, and what could be other criteria applying beyond the "general principle".** Given the current lack of visibility on cost evolutions for clean hydrogen technologies, a flexible approach and clarification on the eligible costs would also be welcome.

6.1.2 There should be stronger safeguards to avoid lock-in of inefficient and expensive technologies

The safeguards and provisions included in paragraph 108 are among the strongest points of the draft guidelines. To ensure a level playing field between partial decarbonisation solutions (such as Blue Hydrogen combined with CCS or grey hydrogen) and full decarbonisation solutions (such as renewable hydrogen) competing in similar auctions, **it is essential that, in the case of bids for partial decarbonisation solutions, the future costs associated with achieving climate-neutrality (plant closure, replacement of fossil-based feedstock with renewable-based etc.) are (i) clearly identified and monetised and (ii) factored in the bid.**

It is equally necessary to define clearly i) the responsible party for enforcing the safeguards, ii) a strong monitoring and reporting process and ii) the consequences of not fulfilling them, which should introduce significant disincentives or penalties. The binding commitments defined in point 108 must be assumed by the beneficiary and its legal successors, who must be clearly identified and reported by the Member State to the Commission. The fulfilment of the binding commitments must be duly reported by the beneficiary or its successor to the Member State and Commission.

Finally, decarbonisation is about using cleaner alternatives, but also more energy efficient alternatives. This is important in the context of energy system integration in which competition between direct electrification and other alternatives, including indirect electrification is developing. **We should therefore assess the relevance of clean technologies in relation with the end-uses and the possible displacement of more energy efficient alternatives.**

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SolarPower Europe's amendment proposal

108. Aid for decarbonisation may unduly distort competition where it displaces investments into cleaner alternatives**, including more energy efficient alternatives,** that are already available on the market, or where it locks in certain technologies, hampering the wider development of a market for and the use of cleaner solutions. The Commission will therefore also verify that the aid measure does not stimulate or prolong the consumption of fossil-based fuels and energy[63], thereby hampering the development of cleaner alternatives and significantly reducing the overall environmental benefit of the investment. Member States should explain how they intend to avoid that risk, including by way of binding commitments to use mainly renewable or low carbon fuels or phase out fossil fuel sources **or undertake decommissioning under a predefined timescale. Such commitments must be clearly defined and subject to reporting.**

6.1.3 There should be a robust framework for hydrogen production for refuelling stations (category 4.3)

The proposed provisions for State Aid related to mobility projects are very positive. SolarPower Europe welcomes the inclusion of on-site renewable hydrogen production facilities into the eligible costs.

However, the proposed framework could be further improved and in particular:

- **State aid for renewable hydrogen in mobility must be restricted to mobility segments where hydrogen has been identified as the most efficient solution** compared to other options – namely electrification (p. 140), and
- **OPEX support should be included as part of the eligible costs** (pp. 177-178). OPEX, and in particular electricity, is one of the main cost components of electrolysers, and is vital to accelerate technology ramp-up. In our view, Member States should have the possibility to cover OPEX costs and/or provide direct support to end-users for a determined period (i.e. until 2030), with the possibility of periodical revisions.

7 Aid for the security of electricity supply (categories 4.8)

We welcome the revised provisions on the aid granted for the security of electricity supply and their further alignment with the provisions of the Clean Energy Package. Capacity mechanisms should be introduced as a last resort mechanism and be preceded by a thorough evaluation of the potential of alternative, clean technologies. We also welcome the further safeguards introduced against the risk to finance activities that aggravate negative environmental externalities in the long term.

Finally, the encouragement to member states to introduce additional criteria or features to promote the participation of greener technologies (point 304) is a much-needed improvement. Some features are critical to support the participation of renewables and clean technologies in capacity mechanisms, such as the de-rating factor. Used in the UK, it acknowledges the intermittency of RES or the limited energy capacity/duration of storage. At the same time, it allows these technologies to participate if their bids (including their derating factor) still make economic sense based on the relative contribution they can make to supporting the system at times of system stress.

8 Aid to energy infrastructure (category 4.9)

We welcome the possibility for **electrolysers to be eligible for infrastructure aid** if it is a PCI under the TEN-E regulation. In other cases, electrolysers can be supported under section 4.1 on aid for the reduction of GHG emissions. **We also support the inclusion of pipelines for the local distribution of hydrogen** in the CEEAG, as well as the inclusion of dispatch facilities.

Blending hydrogen with natural gas into the gas network should be approached with caution. It could end up feeding final uses for which other more effective and efficient decarbonisation options already exist and lock-in technologies using gaseous fuels with limited decarbonisation potential. **We therefore call for stronger safeguards on the eligibility of gas projects**, to avoid investments in stranded assets.

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339. (c) In addition to the approach above outlined, the Commission considers that for natural gas infrastructure investments, the positive effects on competition manifestly outweigh its negative effects on competition where the resulting infrastructure is fit for use for **pure** hydrogen and renewable gases or fuels of nonbiological origin. Where this is not the case, in order to off-set the negative effects on competition, the Member State concerned needs to demonstrate the following: (i) why it is not possible to design the project so that it is fit for use for **pure** hydrogen and renewable gases or fuel of non-biological origin; (ii) why the project does not create a lock-in effect for the use of natural gas; and (iii) how the investment contributes to achieving the Union's 2030 climate target and 2050 climate neutrality target.

Should blending with natural gas be allowed, it should only be so under the following conditions:

- Only during a "transitional period", in line with Council General Approach on the TEN-E Regulation. We support the introduction of a sunset clause for blending, following the direction of the TEN-E: at the latest by 31st December 2029, these facilities "will cease to be natural gas assets and become dedicated hydrogen assets; (…) Any eligibility for Union financial assistance [under TEN-E] shall end on 31st December 2027".
- Only renewable hydrogen should be injected into gas grids.
- Only if an additionality criterion can be ensured and verified.
- Only if electrolysers are connected to grid branches that will surely be repurposed for pure hydrogen.

9 Aid to energy intensives (category 4.11)

Solar PV is set to be one of the major electricity generation in Europe's future energy system, becoming the first installed electricity capacity as of 2025 according to the IEA. Redeveloping a strong solar PV value chain in Europe, from manufacturing to installation, increasingly becomes of strategic and economic interest for governments and for the solar PV industry. This has driven a momentum to reinvest into solar PV manufacturing facilities, driven by positive framework conditions. The domestic market demand is growing exponentially (19GW/y by 2030 according to the NECPs, an average 30 GW/y by 2024 only according to SolarPower Europe forecasts). Europe's state of the art R&I ecosystem has enabled technological leadership in key segments of the value chain, especially in wafers (i.e. NexWafe) and cells (Heterojunction and Perovskites). Investors' appetite is strong, with sizeable new investments in Europe (Oxford PV, July 2019, +70 M€; Meyer Burger, July 2020, 160M€, at least 3 major projects finalizing financing in Europe).

Redeveloping solar PV manufacturing activities will require establishing a competitive business environment to allow for solar PV manufacturing activities to compete with foreign manufacturers until a level playing field is established. This is even more relevant considering that the upstream part of the PV manufacturing industry (polysilicon production, cells and modules manufacturing) is strongly energy intensive and highly exposed both to electricity and CO2 prices. To relocate PV manufacturing in Europe, power-intensive **PV manufacturing will require access to cost-competitive and clean electricity.**

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We would therefore like to share the following comments:

Regarding proportionality (points 360 to 362), the guidelines must allow for a compensation of >75% for production that is exceptionally power-intensive. In particular, it is important that Member States are allowed to continue their reduction schemes based on interpretations made in the past to ensure legal certainty.

Regarding eligibility (points 360 to 362), we stress that "undertaking" should be considered as a unit/division within a company that can act independently.

Regarding the conditions (point 365), we would like to share some concerns related to the attachment of "green" conditionalities to receiving aid in the form of reductions. We generally promote these conditionalities, such as the use of renewable PPAs, as this is necessary to steer policy instruments towards climate neutrality in the long-term. However, the original purpose of the reductions is to safeguard competitiveness of energy-intensive industrial consumers exposed to global competition. Too many "green" obligations, while frameworks are not fully developed, such as that of corporate sourcing, could result into policy instruments that are inefficient and unpredictable in achieving their original purpose.

In particular, the obligation to reduce the carbon footprint of the electricity consumption should consider the remaining barriers in some countries to corporate sourcing of renewable electricity. In addition, the obligation to reinvest 50 % of the aid amount in projects that lead to substantial reductions of the installation's greenhouse gas emissions is not proportionate to the original rationale of the levy reduction aimed at safeguarding competitiveness.