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IOGP response to the targeted Consultation for the Evaluation of the Guidelines on State aid for Environmental protection and Energy 2014-2020 (EEAG)

Question 5. Based on your experience, has State aid granted under the EEAG or the GBER generally achieved the relevant climate and environmental protection objectives while maintaining a competitive internal market?

a) New rules for CCS/CCU are needed

It is now clear that CCS/CCU will be necessary to achieve the EU's Climate and Environmental Protection Objectives and that this will require significant elements of State aid. The practical experience from CCS/CCU projects to date is that the state aid process has not yet delivered sufficient financial support.

Enabling a flexible approach to both investment and operation aid in part of the CCS chain will help encourage investment in CCS/CCU. Widespread investment and deployment of CCS/CCU with State aid assistance will help achieve the EUs climate and energy objectives and stimulate new markets for carbon capture, transport and storage as well as facilitate the transition to hydrogen.

The Guidelines (Section 3.6 EEAG) as they are currently written follow an overly rigid structure for the CCS chain which is not consistent with the likely development of the sector. For example, carbon capture technologies are seen as an attachment to current manufacturing processes (paragraph 164 & 165) or power generation. Whereas in fact , CO2 capture may be an integral part of a production or electricity generation process. Under the current guidelines this type of integral capture process risks being excluded from state funding as it does not correspond to the narrow requirements anticipated.

Furthermore, when the guidelines were written, carbon capture and storage projects were envisaged as being carried out within the same company responsible for the carbon emissions as an integrated project with capture, transport and storage all within one project. More recently, however, alternative business models with a disaggregated value chain have become accepted. For example, for decarbonisation of industrial regions, CO2 transport and storage infrastructure will most likely receive CO2 from a multitude of capture facilities. The State aid guidelines using eligibility costs does not consider how enabling the construction of infrastructure, such as pipelines and injection facilities, may benefit the decarbonisation of several industrial processes.

As drafted, the State aid guidelines don't consider how enabling the construction/retrofit of infrastructure, such as pipelines and injection facilities, may benefit the decarbonisation of several industrial processes.

As CCS/CCU should be perceived as a full chain system - from capturing, through transportation of CO_2 as well as CO_2 storage and utilisation, it is important to reflect this in the future EEAG.

The guidelines need to be updated to allow for a wide range of different circumstances and business models. This may need to involve both investment aid and operating aid with the same degree of flexibly that has been made available for renewable energy investments. In this context, we recommend to consider policy recommendations outlined in the report *'The potential for CCS and CCU in Europe'* available here: https://ec.europa.eu/info/sites/info/files/iogp_-_report_-_ccs_ccu.pdf In particular, contracts for difference, tax incentives for CO_2 storage should be considered.

Question 16. Based on your experience, have the EEAG and GBER adequately addressed recent market developments or technological changes?

It is of key importance that the future EEAG will support the developments related to CCS, CCU, storage, hydrogen, synthetic fuels and low-carbon gases, low- & zero-emission vehicles as they will contribute to the achievement of the Paris Agreement goals and the EU climate & energy objectives:

a) About CCS/CCU

When the 2014-2020 EEAG were drafted, CCS was primarily seen as a technology to produce low-carbon electricity, with the transport and storage infrastructure tied to a gas or coal fired power plant. Although CCS remains an important option to decarbonise electricity, As shown by recent studies, CCS/CCU must now also be considered as an essential technology to decarbonise industry[1] and domestic heat requirements though hydrogen production[2].

All credible scenario modellings (e.g. IPCC Report, IEA, Commission's long-term strategy) show that CCS/CCU will be key for meeting the targets set by the Paris Agreement[3].
We observe several cases in which the rules are outdated and should therefore be upgraded to match future expectations for CCS/CCU projects in the EU:

- The definition of energy infrastructure concerning CO2 as defined in part 1.3 item (31) (d) of the EEAG only concerns pipeline networks, not waterborne solutions. At the same time, the chapter on aid to CCS in part 3.6 item (164) allows for state aid to transport of CO2 without providing a definition of CO2 transport modes. It is therefore unclear that waterborne solutions to transport CO2 for permanent storage can receive state funding. A number of new CCS projects across Europe are based on shipping solutions connecting to pipelines for CO2 storage – as is the case with the Northern Lights project, which has the PCI status. If the definition of energy infrastructure for CO2 is not modified to include shipping, ship-based CCS projects could face difficulties to access public funding. Such provisions could then hamper the

[1] Material Economics (2019). Industrial Transformation 2050: Pathways to Net-Zero Emissions from EU Heavy Industry Available at: https://materialeconomics.com/material-economics-industrial-transformation-2050.pdf?cms_fileid=b9785e8b652ba47f227181543fc5d1e8

[2] Navigant (2019). Gas for Climate: The optimal role for gas in a net-zero emissions energy system. Available at: https://www.navigant.com/-/media/www/site/downloads/energy/2019/navigant2019gasforclimateoptimalrolenetzeroemissio.pdf

[3] IOGP et all (2019). The potential for CCS and CCU in Europe. Report to the thirty second meeting of the European Gas Regulatory Forum 5-6 June 2019. Available at: https://ec.europa.eu/info/sites/info/files/iogp_-_report_-_ccs_ccu.pdf

development of CCS across the EU as CO2 transport by ship is more flexible compared to pipeline, which is important in the scale-up phase.

- The definition of CCS in part 1.3 item (33) refers to CO2 captured from industrial plants based on fossil fuels or biomass. We understand this today also to include natural gas reforming plants producing hydrogen it would be useful to further specifically confirm that such infrastructure is covered.
- The definition of permanent CO2 storage in the definition of CCS could be expanded beyond geological formations to provide a more flexible approach to CO2 storage options.
- The current EEAG doesn't recognise CCU technologies. We encourage the Commission to define a life cycle analysis methodology which will enable a quantification of the climate abatement potential of different CCU technologies to ensure that the future EEAG will facilitate channeling state aid to these technologies.

There are limited options for enabling negative emissions: land use change and afforestation can, and must play a key role, as can bioenergy coupled with CCS (BECCS) when used in combination with industrial processes, such as steel and cement production. Direct air capture of CO2 combined with CCS may also have an important role to play and the updated guidelines should reflect this wide variety of potential uses of CCS\CCU technology.

b) <u>Hydrogen</u>

Hydrogen will play a crucial role as clean energy carrier in various energy-intensive applications for both heat, power generation and transport requirements as well as offering decarbonised solutions to energy storage. The forthcoming revision of internal market rules for gas will aim to create the framework conditions for low-carbon gases. The forthcoming revision of internal market rules for gas will, among others, aim to create the framework conditions for low-carbon gases. Such a framework should be in line with the upcoming EEAG provisions as state funding will be instrumental for major low-carbon gas infrastructure projects and gas grid adjustments to receive low-carbon gases/ gas-hydrogen blends.

Across Europe, there are several large-scale hydrogen projects planned that aim to demonstrate the viability of hydrogen. These include:

- decarbonising baseload power production by converting a natural gas-based power plant to combust hydrogen (H2M project in the Netherlands),
- converting natural gas grid to supply hydrogen to consumers for clean heating (H21 project in the UK) and industrial uses (H2morrow project in Germany).

These projects involve major infrastructure components that are likely to necessitate substantial state funding, which the EEAG must be tailored to.

Hydrogen or low-carbon gases in general are not specifically covered under any of the outlined sections of the EEAG. In our reading, hydrogen could potentially be considered under the energy infrastructure as well as the generation adequacy chapters, given the vast scope of potential hydrogen applications in the energy sector. However, hydrogen / low-carbon gases are not included in the definition of energy infrastructure (part 1.3 item (31), which outlines the power, gas, oil and CCS sectors only) in the EEAG. This hinders future projects from qualifying for financial support as energy infrastructure projects. Given the possible and highly efficient synergy between gas infrastructure and

hydrogen (through injecting hydrogen to the gas grid)., we consider that the EEAG should incorporate hydrogen / low-carbon gases specifically in the definition of energy infrastructure and review the chapter accordingly or create a separate chapter on hydrogen / low-carbon gas applications, in line with the future gas regulatory framework.

Part 3.2.1.2. item (33) of the EEAG lists several additional indicators for individually notifiable aid assessing a project's contribution to decarbonisation, namely GHG abatement technologies, early adaptation to Union standards as well as future Union standards. In principle, hydrogen / low-carbon gas projects would comply with these indicators. However, they are only considered secondary in the EEAG context and are not coordinated with the energy infrastructure and generation adequacy chapters in the context of low-carbon gases.

The future EEAG should establish conditions that would encourage member states to prioritise energy infrastructure able to transport hydrogen/low-carbon gases (including gas blended with hydrogen) and generation adequacy projects, where GHG emission abatement potential is one of the most relevant criteria for granting State aid.

The definition of hydrogen / low-carbon gases should be based on GHG emission performance to enable the scale-up of the most promising technologies to foster energy system decarbonisation in the EU. We are strongly in favour of a technology-neutral approach that would create a level-playing field for low-carbon technologies. Therefore, defining hydrogen / low-carbon gas technologies in the context of the EEAG must be based on life-cycle emissions criteria to allow for a balanced and inclusive approach to potential solutions to enable a realistic decarbonisation of the EU energy system.