

## **Role of gas-fired power generation in maintaining the reliability of electricity supply by contributing to grid stability**

Stakeholder feedback has highlighted that gas-fired power generation plays an important role in guaranteeing the reliability of electricity supply by compensating for times of low generation by intermittent renewable energy generation (wind, solar) and contributing to grid stability.

In the context of a rapid transition of the power system to a decarbonised system, the increasing role of intermittent renewables implies the parallel need for dispatchable and flexible power sources for hours of peaking demand and/or low wind and solar production. This is due to the technical characteristics of the need for a supply-demand balance at all moments over the electricity grid. The balance is measured in available instantaneous power (W) rather than energy produced (Wh). Such a criterion, specifically addressing this specificity of the power system, could be added. The long-term objective is that the flexibility provisions are also decarbonised but the available solutions to date (electricity storage, hydrogen, demand response, power-to-heat, decarbonised e-fuels, etc.) are not yet at scale to fit that purpose. Other electricity production technologies (for example reservoir-based hydropower) can also provide such flexibility but even then, gas plants are expected to play a crucial role, as other available sources of flexibility do not have the sufficient technical and/or economical potential to be scaled up to cover the whole flexibility need.

## **Possible formulation of criteria for gas-fired power generation specifically aimed at maintaining the reliability of electricity supply by contributing to grid stability**

Criteria for gas-fired power generation specifically aimed at maintaining the reliability of electricity supply by contributing to grid stability could be designed as follows.

Based on modelling of some scenario consistent with 1.5C global warming, the flexibility needs that are required to integrate very high levels of wind and solar energy generation are likely to be covered in large part by gas plants (with several gas technologies). A gas-fired power plant used specifically for maintaining the reliability of electricity supply by contributing to grid stability can be assumed to operate 2000 hours per year or less. Such average operating hours for gas-fired electricity plants will decline well below 2000 h per year in 2050 (by when they are expected to provide exclusively electricity supply reliability).

By combining 2000 h of operations per year with the minimum lifecycle emissions from combined cycle gas plants of 410gCO<sub>2</sub>e/kWh, as per IPCC AR5 Annex III, one can propose a threshold in terms of annual lifecycle GHG emissions per kW of capacity of 820 kgCO<sub>2</sub>e/kW per year.

This would correspond to the yearly emissions of a Taxonomy-aligned electricity generating source (emitting 100gCO<sub>2</sub>e/kWh), in the hypothetical scenario where it was to operate at full capacity for 8200 h of a year (93.6%).

# Options for including such criteria in the EU Taxonomy first delegated act

Such criteria could be included in the EU Taxonomy first delegated act in one or both of the two following ways:

## **Option 1: including a criterion recognising the electricity reliability role in the DNSH to climate change mitigation for electricity generation from gaseous and liquid fuels**

This proposal would broaden the Do No Significant Harm (DNSH) criteria to climate change mitigation in Annex II of draft 1<sup>st</sup> Delegated Act for the activity Electricity generation from gaseous and liquid fuels to state that both gas-fired plants that meet the criteria given for all energy sources and those contributing to reliability of the electricity supply and contributing to grid stability would qualify.

### Criteria:

Do No Significant Harm to climate change mitigation (Annex II of draft 1<sup>st</sup> Delegated Act) would require complying with at least one of the two following criteria:

- The direct greenhouse gas emissions of the activity are lower than 244gCO<sub>2</sub>e/kWh; or
- The life-cycle greenhouse gas yearly emissions of the activity are lower than 820 kgCO<sub>2</sub>e per kW of net installed capacity

## **Option 2: including a new activity considering the role of gas-fired electricity generation aimed at maintaining the reliability of electricity supply and contributing to grid stability**

Name of new activity: Electricity generation using gaseous fuels aimed at maintaining the reliability of electricity supply and contributing to grid stability

### Description:

Construction or operation of electricity generation facilities that produce electricity using gaseous fuels with the primary aim to ensure the reliability of electricity supply and contributing to grid stability.

The activity is classified under NACE codes D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

### Criteria:

Substantial contribution to climate change mitigation:

- The activity is associated with life-cycle greenhouse gas emissions that are lower than 820 kgCO<sub>2</sub>e per kW of net installed capacity per year.
- The power plant is compatible with co-firing with low carbon gaseous fuels (hydrogen, biogas).
- Life-cycle GHG emissions are calculated based on project-specific data, where available, using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018. Quantified life-cycle GHG emissions are verified by an independent third party.
- Where facilities incorporate any form of abatement (including carbon capture or use of decarbonised fuels) that abatement activity complies with the criteria set out in the relevant

Section of this Annex, where applicable. Where the CO<sub>2</sub> emitted from the electricity generation is captured as a way to meet the emissions limit set out in this Section, the CO<sub>2</sub> is transported and stored underground in a way that meets the technical screening criteria for transport of CO<sub>2</sub> and storage of CO<sub>2</sub> set out in Sections 5.11 and 5.12, respectively of this Annex.

- The activity meets either of the following criteria:
  - (a) at construction, measurement equipment for monitoring of physical emissions, such as methane leakage is installed or a leak detection and repair program is introduced;
  - (b) at operation, physical measurement of emissions are reported and leak is eliminated.

#### Do No Significant Harm:

- Refer to existing DNSH for Electricity generation using gaseous fuels

#### Notes:

- a. This activity can be assigned the transitional tag given that
  - it lacks technologically and economically feasible low-carbon alternatives;
  - it is the options offering the best performance available (for this reason only gaseous fuels are considered for electricity reliability provision);
  - it does not hamper the development of low-carbon alternatives since its main role is to make the development of wind and solar power possible;
  - it is not a carbon lock-in since the gas plants can be used with low-carbon gases.
- b. The threshold should be updated over time to have it declining at the same rate as the 100gCO<sub>2</sub>eq/kWh threshold for other electricity generation sources.