Application of the 250 gCO₂e/kWhₑ emission standard for power generation

This document explains how the GHG emissions of power plants are calculated by the Bank to check if projects meet the Emission Standard and are eligible for EIB financing.

The **Energy Lending Policy** (ELP) sets out that, ‘regarding power generation, the EIB will support power projects resulting in specific emissions below a certain threshold. The level of this emission standard is set at 250 gCO₂e per kWhₑ of electricity generated.’

The annex II on Energy Supply of the ELP (p. 32) “In general, the Bank will only support power generation projects which emit less than 250 gCO₂e per kWhₑ. This criterion applies to all technologies including to power generation based on low-carbon energy sources (e.g. geothermal, large-scale hydro, biofuel or biomass), Carbon Capture and Storage (CCS) or using a high proportion of low carbon fuels, combined heat and power (see below) and decentralised energy sources (see annex III). As an exception to this general rule, the Bank will support gas-fired power plants which provide a credible plan to blend increasing shares of low-carbon gas over the economic lifetime of the project, such that the emission standard above is met on average.”

1. **Do the 250 gCO₂e/kWhₑ threshold refer to CO2 emissions only, or also to other CO2-equivalent greenhouse gas emissions?**

   The threshold applies to all greenhouse gas emissions. Emissions of GHGs other than CO2 (e.g. methane, nitrous oxide, HFCs, HFEs, PFCs…) should be converted into CO2-equivalent emissions using the Global Warming Potential Factors listed in the EIB **Carbon Footprint Methodology**.

2. **Does the 250 gCO₂e/kWhₑ limit concern only emissions from fossil-fired power plants?**

   The limit applies to all greenhouse gas emissions irrespective of whether the source is considered fossil or non-fossil. In the case of renewable generation, effective emissions would include significant fugitive emissions from geothermal and reservoir based hydropower for example. Emissions from renewable fuels (e.g. biomass, biogas or biofuels) are based on a lifecycle GHG assessment.

3. **What is the applicable basis for the 250 gCO₂e/kWhₑ threshold? Gross or net generation?**

   The threshold should be compared to a plant’s net generation, i.e. the useful electricity produced by the plant.

4. **Will EIB consider full lifecycle emissions of fuels in determining eligibility, as proposed in the EU taxonomy on Sustainable Finance? What methodology should be used to determine lifecycle emissions?**

   The EIB will consider emissions in line with its **Carbon Footprint Methodology**, which in specific cases such as renewable fuels include full lifecycle emissions. The Carbon Footprint Methodology is subject to regular review and updates.

   In the case of renewable fuels (e.g. biomass, biogas or biofuels), the effective carbon content of the fuel will be based on a lifecycle GHG assessment. The EIB will align with the sustainability criteria of the recast Renewable Energy Directive (RED-II: 2018/2001/EU) in its consideration of emissions values to use for renewable fuels.

5. **Can the EIB finance hybrid solar projects with diesel generators (as backup to PV/biomass or to cover certain hours)? What % of diesel contribution is allowed (if any)?**

   Small-scale renewable-fossil fuel hybrid projects can be financed even if diesel generators are used, subject to the constraint that overall emissions for the power generation result in GHG emissions of power of less than 250 gCO₂ per kWhₑ. This concept supports the financing of backup and peaking fossil fuel generation units that are integrated components of a renewable power project as long as the project complies with the threshold.

   If a renewable-fossil fuel hybrid project does not comply with the 250 gCO₂e/kWhₑ threshold, only the renewable components are eligible for financing.
6. **How will the co-firing of fossil and non-fossil fuels be considered for power generation and the electricity component of cogeneration?**

In case of co-firing fossil and low carbon fuels for power generation or cogeneration, the average greenhouse gas emissions will be determined over the economic lifetime of the project based on a credible and demonstrable fuel mix that meets the 250 gCO$_2$/kWh$_e$ threshold.

7. **How should the threshold be applied to projects with varying levels of emissions over the lifetime of a project?**

The ELP includes an exception to the Emission Standard of 250 gCO$_2$/kWh$_e$:

“As an exception to this general rule, the Bank will support gas-fired power plants which provide a credible plan to blend increasing shares of low-carbon gas over the economic lifetime of the project, such that the emission standard above is met on average”

Declining levels of emissions (e.g. from the gradual introduction of low carbon fuel co-firing) over the lifetime of the project need to be based on credible and acceptable strategies to secure low carbon fuel supplies, or other GHG abatement options (e.g. carbon capture and storage).

For the purpose of determining EIB eligibility under the ELP, the lifetime of a project is the economic life of the project. An operation’s economic lifetime is determined by EIB services in line with its publicly available guide for *The Economic Appraisal of Investment Projects at the EIB*. Economic life is defined at project appraisal, based on technology benchmarks and contractual structure. The default economic life for gas-fired power generation projects is 15 years.

Note that the contractual obligation of an EIB loan will be limited to the loan tenor, which in turn may not exceed economic lifetime. For practical purposes, EIB loan tenor may therefore be used as an approximation of project lifetime.

8. **What is a credible and acceptable demonstration of abatement? Are “low carbon ready” projects eligible even if they do not meet the 250 gCO$_2$/kWh$_e$ threshold today?**

All power generation and cogeneration projects must comply with the 250 gCO$_2$/kWh$_e$ threshold to be eligible. Abatement options include the use of carbon capture and storage, co-firing with low carbon fuels, cogeneration, or any other technology which allows significant and sustained greenhouse gas reduction.

Being “low carbon ready” is not sufficient. The proposed emissions trajectory and fuel use scenarios for a given project need to be based on contractual commitments with fuel suppliers for physical flows through the network or verified reputable Guarantees of Origin, and, in the longer term, credible market assessments that confirm the future existence and availability of underlying low carbon fuel or other abatement assumptions.

The proposed emissions trajectory will be included as a contractual commitment in the EIB finance contract.

9. **How will the EIB track varying emissions levels?**

Projects under the EU ETS will be obliged to communicate to the EIB annual ETS reports to verify their commitments over the lifetime of the EIB support (e.g. loan tenor). Energy projects outside the ETS will also be required to annually report to the EIB on emissions and energy indicators, where relevant. These indicators will be confirmed as part of the project appraisal, and the resulting obligations will apply for the duration of the EIB loan tenor.

**Cogeneration (Combined Heat and Power)**

10. **How does the threshold apply to cogeneration projects? What is the Heat Bonus method?**

The Heat Bonus method is a way of allocating fuel consumption (and GHG emissions) to the heat and power generated by a cogeneration plant. The EIB applies the following approach when verifying eligibility of combined heat and power (CHP) plants under its new energy lending policy (ELP):

$$\text{Unit specific GHG emissions of power generation in a CHP plant}$$
$$= \frac{\text{(Total GHG emissions CHP plant} - \text{Total GHG emissions of an alternative heat source)}}{\text{Total net electricity generation of the CHP plant}}$$
The alternative heat source is a heat-only boiler with a standard efficiency for the type of fuel and boiler, as per the harmonised efficiency reference values for separate production of heat in Annex II of Commission Delegated Regulation (EU) 2015/2402, reviewing harmonised efficiency reference values for separate production of electricity and heat.

CHP worked example:
A proposed gas-fired combined heat and power project has an expected net annual electricity generation of 100 GWh(e), to be exported to the grid, and 300 GWh(th) of steam to an on-site industrial off taker. It consumes 1650 TJ of natural gas annually. Natural gas has an emissions factor of 56.10 tCO2 eq/GJ. The reference efficiency for a gas-fired heat only steam boiler is 87%.

- To produce the same amount of heat, the reference gas boiler would consume 300/87% = 345 GWh of gas, or 1241 TJ.
- Subtract this from the total CHP fuel consumption (1650 TJ) to determine the share of the CHP fuel consumption attributed to power generation: 1650 - 1241 = 409 TJ.
- Multiply by the emissions factor of gas: 409 * 56.1 = 22,924 tCO2eq annual GHG emissions
- Divide by the annual electricity production: 22,924/100 = 229 tCO2eq/GWh or gCO2e/kWh
- 229 < 250, therefore the project is eligible.

11. Which value should be used for a cogeneration plant that is able to vary its relative heat and power output, e.g. backpressure plants?
The EIB will consider the expected operation parameters defined by the promoter’s base case at the time of appraisal.

12. Can the EIB finance gas-fired small or micro-CHP installations?
Small gas CHP installations, which are part of an energy efficiency investment under Annex I of the ELP, may be eligible if they fulfil all of the following conditions:

- They serve space heating functions; and
- They qualify as small efficient gas-fired cogeneration units under the Eco-Design Directive, with a rated heat output below 400 kW; and their energy label is A or above; or, if no energy label is available, they meet the equivalent efficiency requirement (seasonal space heating efficiency of at least 90%); or
- They qualify as eligible central air heating products under the Eco-Design Directive, with a rated heat output below 1MW, and efficiency requirements depending on technology. In practice, installations with an overall efficiency above 90% should be able to meet this condition.

13. Does the 250 gCO2e/kWh(e) threshold apply to heat-only boilers?
No, the threshold only applies to power generation and co/tri-generation projects.

14. Can the EIB finance Carbon Capture and Storage retrofits to existing coal, oil or gas power plants?
Yes, Carbon Capture and Storage retrofits are eligible for EIB financing, providing they meet the Bank’s Emission Standard for power generation and result in power plant emissions levels below 250 gCO2e/kWh(e).