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BRIEFING PAPER

OCTOBER 2017

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Aligning the EIB Emissions Performance Standard (EPS) with the Paris Agreement

Main points

Since the EIB set up its initial EPS in 2013, the context has radically changed:

- The Paris Agreement is a game changer and it requires more efforts;
- Climate science is tighter than ever; the IEA stated that the world needs to reach an average of 100 g CO2/kWh for new power generation in 2035;
- Renewable power is becoming more available, competitive and affordable every day;
- The EU is discussing mandatory EPS in two regulations for both new and existing fossil-fuel fired plants;
- In the period 2013-2016 the EIB supported fossil-fuel fired power plants that are far below the EIB EPS level, with two exemptions allowed by the EIB Energy Lending Criteria.

On these bases, our recommendations are as follow:

- The EIB should set its new EPS level at 200 g CO2/kWh in order to send a strong signal to both power industry and investors.
- The two exemptions to the EPS in the EIB Energy Lending Criteria remain applicable, to allow flexibility in exceptional cases. In such cases the EIB should clarify and strengthen the justification provided.

Introduction

The European Investment Bank (EIB) is being reviewing its Emissions Performance Standard (EPS) in 2017. Its EPS is part of the EIB Energy Lending Criteria[1] adopted in July 2013, and set at a level of 550 g CO2/kWh.

The EPS review is a critical opportunity for the EIB to align its energy portfolio with the Paris Agreement. It is also a crucial credibility test before the review of the full EIB Energy Lending Criteria in 2018.

After the EIB EPS was set up in 2013, the game-changing UNFCCC Paris Agreement was signed by 195 countries and ratified. The agreement sets out a global action plan to "hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels". **The Paris Agreement is more ambitious than previously agreed climate targets, and thus requires a step change for adequate implementation.**

In addition, its Article 2-1 (c) highlights the need to make "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development" – in other words, to align financial flows with the well below 2°C climate target.

1. What does latest climate science say on fossil fuels?

Several reports have raised the alarm on the risks of new fossil fuel-fired power generation, given the huge carbon budget already locked in by existing capacity:

- In March 2016 an Oxford University study building upon earlier research finds[2]: "Our core result is that for a 50% probability of limiting warming to 2C, assuming other sectors play their part, **no new investment in fossil electricity infrastructure (without carbon capture) is feasible from 2017 at the latest"**.

- It confirms the analysis of the 2012 World Energy Outlook[3]: from the International Energy Agency (IEA): "Our 450 Scenario finds that almost four-fifths of the CO2 emissions allowable by 2035 are already locked-in by existing power plants, factories, buildings, etc. **If action to reduce CO2 emissions is not taken before 2017, all the allowable CO2 emissions would be locked-in by energy infrastructure existing at that time**."

[1] EIB (2013), Energy Lending Criteria. EIB and Energy: Delivering Growth, Security and Sustainability - EIB's Screening and Assessment Criteria for Energy Projects

[2] Pfeiffer, Millar, Hepburn, Beinhocker (2016), The '2C capital stock' for electricity generation: Committed cumulative carbon emissions from the electricity generation sector and the transition to a green economy, in Nature

[3] International Energy Agency (2012), World Energy Outlook

- In August 2016, Erickson et al.[4] publish a study assessing carbon lock-in and produce two main findings: globally, coal-fired power plants present the greatest carbon lock-in risk globally; the second risk of lock-in is from gas-fired power plants and amounts to 25 GtCO2.

- In the 2016 World Energy Outlook, **the IEA stated that the world needs to reach an average of 100 g CO2/kWh** for new power generation over the next two decades (2015-2035) to reach climate stabilization. It found that "at the current relative shares of low-carbon and fossil fuel capacity investments, the world will not arrive at the 2DS level of 100 kg/MWh by the late 2030s" [5].

Two elements should be noted in addition:

- These studies are focused on a 2°C pathway – which is less ambitious than the Paris Agreement's targets of well below 2°C /1,5°C. Logically the Paris Agreement does now require increased efforts and tighter deadlines[6];
- The IEA target of 100 g CO2/kWh for 2035 is a global average. Given the common but differentiated responsibilities of countries within the framework of the Paris Agreement, the EU countries should increase their efforts relatively and achieve this target sooner, to leave more room to poorer countries.

This leads to the following conclusions:

- New electricity generation should very rapidly become zero carbon, to avoid the risk of carbon lock in;
- In the case this is not done rapidly enough, it is increasingly likely that a substantial part of the existing fossil fuel-fired power plants will have to undergo early closure to achieve the Paris Agreement (asset stranding). This would be a costly and uneconomic pathway, that should be avoided.

The EU High Level Expert Group on sustainable finance, commissioner by Vice-President Dombrovskis of the European Commission, published its interim report in July 2017 in which it notably urges to 'align public funds with sustainability', and, for public banks like the EIB, calls for "ensuring that investments no longer support or de-risk unsustainable investments such as fossil fuels" [7].

What does this imply for fossil-fuel fired power plants?

Carbon intensity at the combustion point (the power plant) for different power sources is as follows:

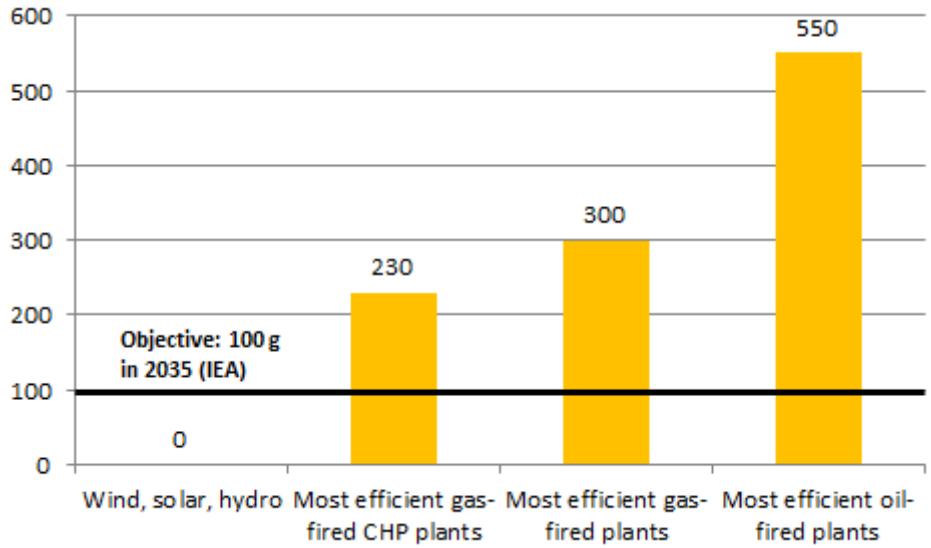
[4] Erickson P., Sivan Kartha S., Lazarus M., Tempest K. (2015), Assessing carbon lock-in, Environmental Research Letters, Volume 10, Number 8

[5] IEA (2016), World Energy Investment 2016

[6] The IEA has published in June 2017 a new and tighter scenario (B2DS) which is presented as a 1.75°C scenario. In June 2018 the Intergovernmental Panel on Climate Change is expected to publish a 1.5°C scenario. Such scenarios should be taken as the new benchmarks to assess decarbonisation efforts and set future milestones

[7] https://ec.europa.eu/info/sites/info/files/170713-sustainable-finance-report_en.pdf

Figure 1. Emissions factors for power plants at combustion point (in g CO2/kWh)



Sources: IEA, Ecofys, IPCC
CHP: combined heat and power

It should be noted that the carbon intensity at combustion point captures only a part of the full life cycle emissions: the upstream emissions are not included. According to Climate Action Tracker, "life-cycle emissions, i.e. taking into account the emissions in the fuel chain and the manufacturing of the energy conversion technology, are estimated at 410–650 gCO2eq/kWh for natural gas combined-cycle plants. This is lower than power from hard coal (710–950 gCO2eq/kWh), but much higher than for most renewable technologies (2–180 gCO2eq/kWh) (IPCC 2014)"[8]. Importantly, assuming that the carbon intensity of gas is 300-350 gCO2eq/kWh at the combustion point, this would imply that **the total carbon intensity of gas is on average 63% higher than its carbon intensity at combustion point**. Given its higher potential to leak than oil (liquid) and coal (solid), gas must therefore be considered with extra care – and gas-fired power plants accordingly.

2. Are renewable power alternatives competitive and affordable?

According to the IEA Renewables 2017 study[9], **renewables accounted for almost 2/3 of net new power capacity around the world in 2016, with almost 165 gigawatts (GW) coming online. Over the next five years, renewables are expected to remain the fastest-growing source of electricity generation worldwide**: through 2022, renewable electricity capacity forecast to expand by over 920 GW, an increase of 43%. While electricity demand growth is slowing in many countries around the world, the deployment of renewable power generation continues to grow dramatically.

[8] Climate Action Tracker – Ecofys, Climate Analytics, New Climate Institute - (2017), Foot off the gas: Increased reliance on natural gas in the power sector risks an emissions lock-in
[9] http://www.iea.org/renewables/

The cost-competitiveness of renewable power generation has reached historic levels. According to IRENA the levelized cost of electricity for wind and solar (LCOE) -- the electricity price at which investment in a new power plant covers capital and operating costs and generates a healthy return on investment -- is already well within the range of fossil fuels power projects in many countries and regions[10], and provides considerable economic and social benefits. Examples include:

- Onshore wind is now one of the most competitive sources of electricity available. Technology improvements, occurring at the same time as installed costs have continued to decline, mean that the cost of onshore wind is now within the same cost range, or even lower, than for fossil fuels. Wind projects around the world are consistently delivering electricity for US $0.05 to US $0.09/kWh without financial support, with the best projects costing even less.

- Solar PV module prices in 2015 were 75 to 80% lower than their levels at the end of 2009. Between 2010 and 2014 the levelized cost of electricity (LCOE) of utility-scale solar PV has fallen by half. The most competitive utility-scale solar PV projects are now regularly delivering electricity for just US $0.08 per kilowatt-hour (kWh) without financial support, compared to a range of US $0.045 to US $0.14/kWh for fossil fuel power. But even lower costs are being contracted for 2017 and beyond:

    - In India, a 500MW section of the Bhadla Solar Park saw a price of just $0.038 USD per kWh (2.44 Indian rupees) in May 2017[11]. Prices for solar PV in India's recent power auctions has led to prices for solar projects that are already cheaper than that for new coal power[12].
    - In Mexico, a 300MW project by Fotowatio saw a price of $0.02699 USD per kWh as of February 2017[13].
    - In the United Arab Emirates, a solar project saw bids as low as $0.0242 USD per kWh in September 2016[14].
    - South Africa, Saudi Arabia, Australia and Chile are all building wind and solar projects that are cheaper or competitive with coal power plants[15].

In the EU, of the 24.5GW of new capacity built across the EU in 2016, 86% was from renewable sources (wind, solar, biomass and hydro), eclipsing the previous high-water mark of 79% in 2014[16].

Concentrated solar power (CSP) and offshore wind are still typically more expensive than fossil fuel-fired power generation options today, with the exception of offshore wind in tidal flats. But these technologies are in their infancy in terms of deployment.

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[10] IRENA. "Levelised Cost of Electricity 2010- 2016," accessed August 8, 2017

[11] Tim Buckley, "IEEFA Asia: India's Electricity-Sector Transformation Is Happening Now," Institute for Energy Economics and Financial Analysis, May 17, 2017

[12] Anindya Upadhyay and Rajesh Kumar Singh, "Cheaper Solar in India Prompts Rethink for Coal Projects," Bloomberg.com, June 1, 2017

[13] Blanca Diaz Lopez, "Mexico signs lowest-price solar contracts to date," PV Magazine, February 6, 2017

[14] Anthony Dipaola, "Cheapest Solar on Record Offered as Abu Dhabi Expands Renewables" Bloomberg.com, September 19, 2016

[15] Giles Parkinson, "Renewables now cheaper than coal and gas in Australia," RenewEconomy, February 7, 2013. http://reneweconomy.com.au/renewables-now-cheaper-than-coal-and-gas-in-australia-62268/; Jeffrey Barbee, "How renewable energy in South Africa is quietly stealing a march on coal," The Guardian, June 1, 2015; Institute for Energy Economics and Financial Analysis, "Saudis Announce $50 Billion Shift to Renewables," IEEFA.org, April 21, 2017; Bloomberg, "Solar Sold in Chile at Lowest Ever, Half Price of Coal," Bloomberg.com (subscription only)

[16] Adam Vaughan, "Almost 90% of new power in Europe from renewable sources in 2016", The Guardian, 9 February 2017

Both represent important renewable power sources that will play an increasing role in the future energy mix, as their costs will continue to come down.

The next stage of the remarkable story of renewables will be driven by their underlying competiveness. In a growing number of countries renewable energy is now often the most economic source to meet their electricity demand. Renewable power has never cost so little and it is increasingly the option that will save consumers money today and even more in the long run. It provides an immediate, viable and affordable solution to the challenge of climate change.

The unprecedented opportunity of growing competitiveness and availability of renewable energy globally should lead the EIB to fully refocus its power generation support on renewables to meet the goals of a secure, reliable, affordable and environmentally sustainable power sector.

3. Will the EU implement regulatory EPS?

The EU is putting into place a whole new regulatory framework to implement its 2030 climate and energy targets and to operationalize the Energy Union.

Two regulations being currently discussed and negotiated by the EU institutions set up an Emissions Performance Standard:

- The legislative proposal of the European Commission for the Regulation on the internal market for electricity (Art 23§4) introduces an EPS of 550g CO2/kWh for capacity mechanisms[17];
- The plenary vote of the European Parliament for the ETS regulation (amendments 94 and 104) introduces an EPS of 450g CO2/kWh for funding mechanisms (Modernisation Fund and Art 10c) for the post-2020 period[18].

If these EPS are finally confirmed by EU institutions, they will equal or exceed the EIB EPS from 2013. **Importantly, in both regulations the EPS will ultimately apply to existing fossil fuel fired-plants – while the EIB EPS only applies to new plants or significant retrofits, and can therefore be tighter.**

This would mean that the EIB EPS becomes less ambitious than the ones from these EU regulations, if confirmed. Our view is that the EIB, as the public policy driven bank of the EU, should be at the forefront and show exemplarity - as it did initially in 2013. **This therefore calls for a significant improvement of the EIB EPS, ensuring that it goes well below the tightest level discussed for the future EU regulatory framework - that is 450g CO2/kWh.**

[17] https://ec.europa.eu/energy/sites/ener/files/documents/1_en_act_part1_v9.pdf
[18] http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2017-0035+0+DOC+PDF+V0//EN

4. What fossil fuel fired plants did the EIB support since the introduction of its EPS?

In the period 2013-2016 the EIB has been financing 11 power plants: (the year 2013 is limited here to the period after the introduction of the EIB EPS)

NAME	COUNTRY	DATE	SIGNED AMOUNT (€)	CATEGORY	Carbon intensity	MW power
Raahe plant	Finland	2014	60.000.000	CHP (blast furnace gas)	390 g CO2/kWh	115
PPC power project on Greek islands *	Greece	2014-2015	190.000.000	Diesel & heavy fuel oil power generators	650 gCO2/kWh **	290
PGE power generation	Poland	2015	114.168.550	CHP (gas)	247 and 282 g CO2/kWh	135
El Shabab power plant	Egypt	2015	205.000.000	OCGT to CCGT conversion (gas)	431 g CO2/kWh	1500
Elering Emergency reserve power plant	Estonia	2015	32.000.000	Gas plant (peaking/reserve unit)	475 gCO2/kWh	250
Damanhour power plant	Egypt	2015	550.357.733	CCGT (gas)	353 gCO2/kWh	1800
Maldives sustainable energy development	Maldives	2015	45.000.000	Diesel generators (+ 21 MW solar PV and accumulators)	600 gCO2/kWh **	40
Kiel plant	Germany	2016	105.000.000	CHP (gas)	230 gCO2/kWh	200
Lahti biomass plant	Finland	2016	75.000.000	CHP (forest residue biomass)	0 g CO2/kWh	110
Kilpilahti plant	Finland	2016	175.000.000	CHP (refinery oil residue)	302 gCO2/kWh	30
Lietuvos Energija Vilnius project	Lithuania	2016	104.500.000	CHP (biomass and waste)	0 g CO2/kWh	88

Notes:
* The PPC project was supported by the EIB in two tranches: in 2014 (80 million €) and in 2015 (110 million €)
** Small island exemption (see below)
This table does not include heating plants, that are not covered by the EIB EPS
CHP: Combined Heat and Power
The data were checked by the EIB

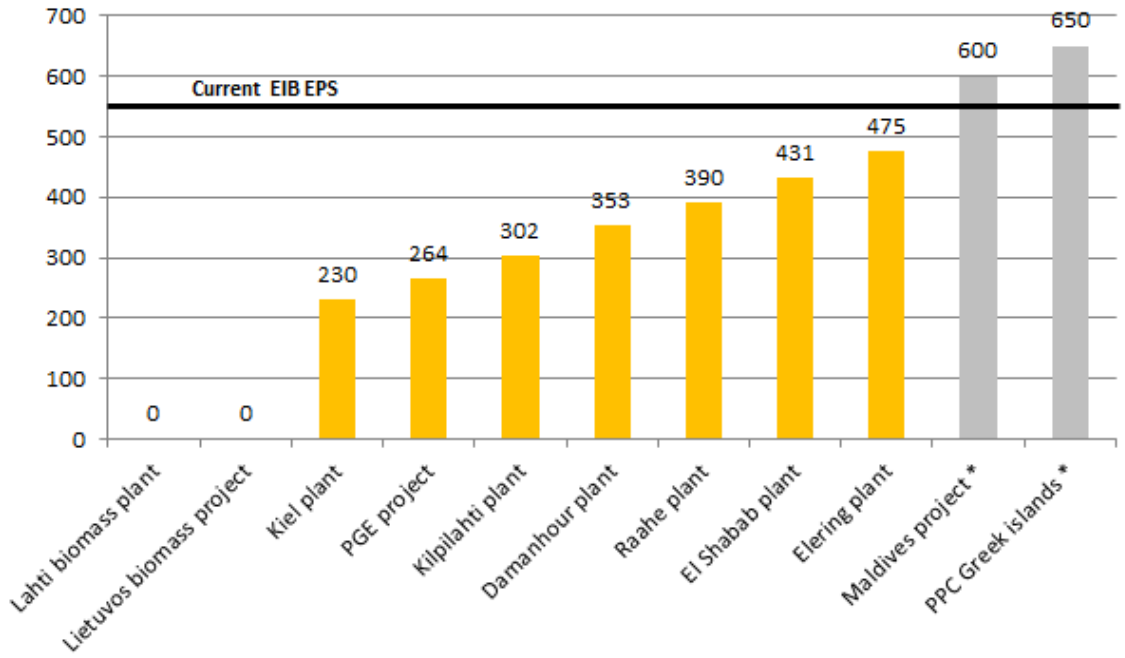
In term of geographies:
- 8 plants are in the EU, for a total of 856 million €;
- 3 plants are outside Europe, for a total of 800 million €.

In term of fuel:
- 6 are burning gas;
- 3 are burning oil and diesel;
- 2 are burning biomass.

The projects have a carbon intensity that is way below the EIB EPS set at 550 g CO2/kWh, with two exemptions: the two projects of Greek islands and Maldives have a carbon intensity above the EIB EPS; they represent 14% of the total EIB financing for power plants in 2013-2016. The Greek project will target 17 islands and the Maldives project will target 160 islands. To support these two projects the EIB

has been using an EPS exemption allowed in its Energy Lending Criteria for isolated energy systems such as small islands.

Figure 2. Carbon intensity of EIB-supported plants in 2013-2016 (in g CO2/kWh)



* Small island exemption to the EIB EPS

We believe that such findings give a significant room for manoeuver to the EIB to lower its EPS:

- All plants supported by the Bank in the past four years are already significantly below the current EPS level (with two exemptions);
- The exemption criteria are working for specific projects (small islands) – although a clearer justification about why the exemption criteria are used and deemed relevant would be welcome.

5. What new EPS level for the EIB?

The previous chapters show that the context since 2013 has radically changed:

- The Paris Agreement is a game changer and it requires more efforts;
- Climate science is tighter than ever; the IEA stated that the world needs to reach an average of 100 g CO2/kWh for new power generation in 2035;
- Renewable power is becoming more available, competitive and affordable every day;
- The EU is discussing mandatory EPS in two regulations for both new and existing fossil-fuel fired plants;
- In the period 2013-2016 the EIB supported fossil-fuel fired power plants that are far below the EIB EPS level, with two exemptions allowed by the EIB Energy Lending Criteria.

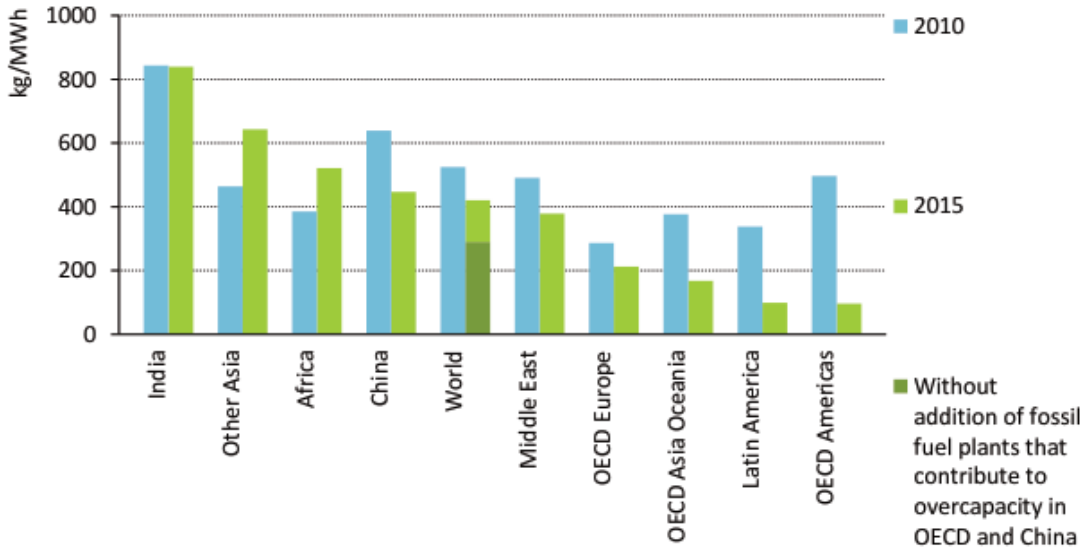
Two exemptions to the EPS in the EIB Energy Lending Criteria
The EIB Energy Lending Criteria contains two exemptions to the EIB EPS:

- "Isolated energy systems such as small islands with no feasible mainland energy connection - and only where there is no economically viable alternative" (paragraph 115). This is the exemption used twice by the Bank in the period 2013-2016 for the Greek island and the Maldives projects;
- "Projects outside the EU located in the poorest countries where it can be demonstrated that projects with carbon emissions above the threshold will have a significant and material positive impact on poverty alleviation and economic development" (paragraph 116).

Given that these exemptions are part of the EIB Energy Lending Criteria not reviewed this year, they will remain applicable. Given the proven flexibility these exemptions provide to the EIB in exceptional cases, they should contribute to enable the Bank to set up a new meaningful EPS level.

The IEA analysis shows that power generation additions in OECD Europe in 2015 reached an average carbon intensity of slightly above 200 g CO2/kWh (see Figure 3) – and set the need to reach a global average of 100 g CO2/kWh for new power generation in 2035 to be on a 2°C pathway.

Figure 3. Average CO2 emissions intensity of commissioned power capacity (IEA)



Source: IEA World Energy Investment 2016, p163

For the EIB, these are important points of comparison to set the level of its new EPS and ensure consistency with the Paris Agreement.

Recommendations:

- The EIB should set its new EPS level at **200 g CO2/kWh** in order to send a strong signal to both power industry and investors.
- The two exemptions to the EPS in the EIB Energy Lending Criteria remain applicable, to allow flexibility in exceptional cases. In such cases the EIB should clarify and strengthen the justification provided.

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