



SUMMARY AND ANALYSIS

TAXONOMY DELEGATED ACT OF FEBRUARY 2<sup>nd</sup> ON CLIMATE MITIGATION

**Table of contents**

Summary of the delegated act.....	2
Analysis of the criteria for gas.....	4
Analysis of the criteria for nuclear .....	8

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Summary of the delegated act

	Nuclear	Gas
Included	Yes	
Category	« Transitional activities » (Article 10(2) of regulation UE 2020/852)	
Types of activities included	Construction of new reactors (Generation 3 or above) / Pre-commercial stage of advanced nuclear technology (research and development, Generation 4 reactors) / Power generation in existing reactors	Electricity production / Heat production / Cogeneration (electricity and heat)
Specific technical screening criteria	<p>For advanced nuclear (Generation 4 reactors): no sunset clause</p> <p>For new reactors: construction permit granted by 2045 (for “best-available technology”, Generation 3 reactors or above).</p> <p>For existing reactors: modifications and upgrades for the purposes of lifetime extension until 2040</p> <p>Criteria concerning the storage of waste and the end of activity of reactors:</p> <ul style="list-style-type: none"> <li>• Management and storage of waste in the member state where it was generated or in a partner member state.</li> <li>• Plan for the storage of high-level radioactive waste by 2050 (for reactors already in operation, this plan is only required for projects authorized after 2025).</li> <li>• Storage of low and intermediate level radioactive waste already available.</li> <li>• Creation of funds for waste management and the dismantling of reactors. Member State must also demonstrate that it will have resources available at the end of the estimated useful life of the nuclear power plant corresponding to the estimated cost of radioactive waste management and decommissioning (compliance with Euratom recommendation).</li> <li>• Report to the European Commission every 5 years on the storage plan and the funds dedicated to storage and decommissioning.</li> </ul> <p>Other criteria:</p> <ul style="list-style-type: none"> <li>• Life cycle greenhouse gas emissions below 100 gCO<sub>2</sub>e/kWh.</li> </ul>	<p>Life cycle greenhouse gas emissions below 100 gCO<sub>2</sub>e/kWh.</p> <p>Or, for plants whose construction permit is granted before the end of 2030:</p> <ul style="list-style-type: none"> <li>• Life cycle greenhouse gas emissions below 270 gCO<sub>2</sub>e/kWh or – for power generation only - an average of 550 KgCO<sub>2</sub>e/kW of plant output over a 20-year period.</li> <li>• <b>For power generation: replacement of a fossil-fired power plant with a capacity no more than 15% greater than that of the fossil-fired power plant and generating at least 55% less greenhouse gases over the lifetime of the plant.</b> / For cogeneration and heat/cool: replacement of a fossil-fired power plant with the same capacity and generating at least 55% less greenhouse gases per output of energy.</li> <li>• <b>Power, heat/cool replaced “cannot be generated from renewable energy sources, based on a comparative assessment with the most cost-effective and technically feasible renewable alternative for the same capacity identified”.</b> The result of this comparative assessment is published and is subject to a stakeholder consultation.</li> <li>• <b>Compatibility with "low carbon" gases and commitment and “verifiable plan” to shift to 100% “low carbon gases” by 2035.</b></li> <li>• New power plant built in a country with a commitment to phase out coal.</li> <li>• For cogeneration: primary energy savings of at least 10% compared to</li> </ul>

*Reclaim Finance – Analysis – Taxonomy delegated act of February 2<sup>nd</sup> 2022*

	<ul style="list-style-type: none"><li>• Criteria concerning the safety and operation of the facilities based on European standards.</li><li>• Use of accident-tolerant fuel from 2025.</li></ul>	<p>the separate production of electricity and heat.</p> <p>Other criteria: regular independent verification of compliance with the criteria is carried out.</p>
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**Analysis of the criteria for gas**

Criteria	Reclaim Finance’s analysis
<p>Life cycle greenhouse gas emissions below 100 gCO<sub>2</sub>e/kWh</p>	<p><b>Summary: The threshold of 100 g CO<sub>2</sub>e/kWh should have been used without any exception to ensure a contribution to climate change mitigation. However, given the uncertainties surrounding plants falling below this threshold, it would have been preferable to simply exclude gas-fired plants altogether.</b></p> <p>The threshold of 100 gCO<sub>2</sub>e/kWh is in line with the recommendations of the expert group (TEG) originally commissioned to lay the foundations of the taxonomy and is far below the emissions of current gas-fired power plants. Indeed, the most efficient gas power plants in operation would emit around 350-360 g CO<sub>2</sub>e/kWh (<a href="#">352 gCO<sub>2</sub>e/kWh for example</a> for the average French cogeneration plant according to RTE). A <a href="#">recent UN study estimates</a> the emissions of European combined cycle gas power plants at 404-513 g CO<sub>2</sub>e/kWh. The <a href="#">RESET project of the EEB</a> puts its situates these emissions between 380 and 400 g CO<sub>2</sub>e/kWh, while pointing out that these figures are probably underestimated because of the methane emissions caused by the production and transport of fossil gas.</p> <p>Thus, without the massive use of carbon capture or the replacement of fossil gas by gases considered "low carbon" - both of which are unrealistic given their <a href="#">prohibitive cost</a> and <a href="#">low efficiency</a> - this threshold de facto excludes new gas-fired plants</p>
<p>Life cycle greenhouse gas emissions of less than 270 gCO<sub>2</sub>e/kWh or – for power generation - an average of 550 KgCO<sub>2</sub>e/kW of power output of the installation over a 20-year period.</p>	<p><b>Summary: Even with a threshold of 270 g CO<sub>2</sub>e/kWh, a gas-fired power plant remains incompatible with European climate objectives and highly CO<sub>2</sub> emitting.</b></p> <p>The use of this threshold derogates from the "technology neutrality" principle of the taxonomy. Fossil gas is the only energy for which electricity and/or heat production can be included when it generates more than 100gCO<sub>2</sub>e/kWh.</p> <p>The 270 gCO<sub>2</sub>e/kWh threshold is lower than the emissions from gas-fired power plants currently operating in the European Union. However, as <a href="#">the draft revision of the EU Energy Efficiency Directive</a> suggests, <a href="#">efficient CHP plants</a> can fall below this threshold. The <a href="#">EEB's RESET project</a> mentions the possibility for plants to achieve emissions of about 210 g CO<sub>2</sub>e/kWh. More generally, gas-fired power plants could go below this threshold by using carbon capture or "low carbon" gases in a relatively limited proportion. For example, capturing 25% of its emissions would be sufficient for a gas plant emitting 360 gCO<sub>2</sub>e/kWh.</p> <p>This threshold is higher than the one set by the <a href="#">European Investment Bank</a> for its loans (250 gCO<sub>2</sub>e/kWh). It is well above the current average carbon intensity of electricity production in Europe (235 gCO<sub>2</sub>e/kWh in 2019 <a href="#">according to the IEA</a> and 226 gCO<sub>2</sub>e/kWh in 2020 <a href="#">according to Ember</a>) and the emissions of renewable energies (e.g. 8 to 83 g for photovoltaic energy and 7 to 16 for onshore wind energy in Europe according to a <a href="#">recent United Nations study</a>). Building such power plants is clearly incompatible with the necessary achievement of carbon neutrality in the European energy sector by 2035 as called for by the IEA in its <a href="#">World Energy Outlook 2021</a>.</p> <p>Moreover, the 550 kg CO<sub>2</sub>e/kW criterion for power generation is more difficult to assess and could significantly broaden the scope of included plants. For comparison, the <a href="#">2019 EU Electricity Market Regulation</a> allows existing power plants in 2019 to benefit from the capacity mechanism until 2025 if they do not meet a 550 g CO<sub>2</sub>e/kWh threshold only if their average annual emissions do not exceed 350 kg CO<sub>2</sub>e/kW installed.</p>

<p>Construction permit granted before the end of 2030</p>	<p><b>Summary: The chose date means that Europe will have to choose between closing down new plants quickly - thus incurring financial losses - to meet its climate objectives or not closing them and not meeting those same objectives.</b></p> <p>The investments required to build a gas-fired power plant generally take more than 10 years (from <a href="#">9 to 17 years</a> in several North American states, for example) to be amortized, and plants operate for easily more than 20 years and up <a href="#">to 40 to 50 years</a>.</p> <p>It is therefore reasonable to estimate that the proposed date would lead to the construction of new gas-fired power plants that would continue to emit greenhouse gases until at least 2042 if they come on line as early as 2022 and 2051 for the latest ones that would come on line in 2031. In the absence of specific political or strategic decisions - such as national decisions to phase out gas or company decisions to close plants early - these plants would emit quantities of GHGs that are incompatible with European climate objectives. On the other hand, such political or strategic decisions would lead to the depreciation of these infrastructures. The risk of stranded assets is therefore major, as <a href="#">Carbon Tracker points out</a> in its analysis regarding new gas power plants.</p> <p>Building new gas-fired power plants is also clearly incompatible with <a href="#">the IEA's goal of achieving carbon neutrality</a> in electricity generation by 2035 in economically advanced countries to limit global warming to 1.5°C.</p>
<p>Plant built in countries that have committed to phase out coal</p>	<p><b>Summary: The lack of a requirement to phase-out coal by 2030 makes this criterion worthless for EU countries. In addition, there is no indication of how compliance with an exit commitment would be ensured or whether non-compliance could be penalized.</b></p> <p>The criterion does not set a date to exit coal. Yet, in order to align with the Paris Agreement, coal-fired power generation must be phased out by 2030 in the EU/OECD and 2040 globally.</p> <p><a href="#">In Europe today</a>, only Poland would not meet this criterion in the absence of a specific exit date. If an exit date of 2030 or earlier were set, Bulgaria (2038 or 2040), Germany (2038 with a possible advance to 2035), the Czech Republic (2033), Slovenia (2033), Croatia (2033) and Romania (2032) would also be excluded.</p> <p>In addition, countries that nominally commit to moving away from coal can easily renege on their pledge or postpone such an exit, but the delegated act does not specify the consequences of such a setback for plants that would have already received "taxonomy-aligned" financing. It is necessary to ensure that states are truly committed to phasing out coal - notably through the adoption of an official phase-out date validated by the Parliament and of a detailed plan for the closure of coal-fired power plants - and that any state that reneges on its commitment while having benefited from taxonomy-aligned funding can be sanctioned.</p>
<p>For power generation: replacement of a fossil-fired power plant with a capacity no more than 15% greater than that of the fossil-fired power plant and generating at least 55% less greenhouse gases over the lifetime of the plant.</p>	<p><b>Summary: This criterion is deliberately vague. If the objective of the taxonomy is indeed to promote the development of sustainable activities in a logic of transition and in coherence with European objectives, renewable energies can replace coal and fossil gas has no place in the taxonomy.</b></p> <p>This criterion aims to ensure that gas-fired plants replace coal-fired plants, even if it does not theoretically exclude the replacement of other power plants such as those running on fuel oil.</p>

<p>For cogeneration and heat/cool: replacement of a fossil-fired power plant with the same capacity and generating at least 55% less greenhouse gases per output of energy.</p> <p><b>Weakened</b></p>	<p>This criterion is extremely imprecise. It does not indicate at what level the replacement is to be made (country, company, site, region), even though this criterion is critical to assess the number of plants that could benefit from inclusion in the taxonomy. Depending on how it is defined, this criterion could concern a significant number of plants in Italy, Germany, Poland and Romania.</p> <p>Moreover, the criterion of a 55% reduction in emissions compared to the replaced coal-fired power plant is easily achievable with gas plants that are below the 270 g CO<sub>2</sub>e/kWh threshold. Indeed, recent coal plants typically emit more than 800 gCO<sub>2</sub>e/kWh and the carbon intensity of coal plants reached <a href="#">900 gCO<sub>2</sub>/kWh in 2018</a> according to the IEA. It is also worth noting that for power generation – and unlike in the draft DA published on December 31<sup>st</sup> - the 55% reduction ought to be measured over the lifetime of the plant, which makes this criterion difficult – if not impossible – to assess ahead as we do not know this lifetime in advance.</p> <p>Above all, coal-fired power plants can be directly replaced by renewable energy, including in Eastern European countries, as shown for example by the <a href="#">Instrat study in Poland</a>. Plans to replace coal-fired power plants with gas-fired power plants denies the <a href="#">real impact of fossil gas</a> on the climate and <a href="#">all scientific evidence</a> that show that it is necessary to immediately and drastically reduce the production and consumption of gas if we want to comply with the Paris Agreement.</p> <p>For Europe, leaving gas behind is also a way to promote its energy security and the stability of energy prices in the longer term, as <a href="#">suggested by the IEA's analyses</a>.</p>
<p>Power, heat/cool replaced “cannot be generated from renewable energy sources, based on a comparative assessment with the most cost-effective and technically feasible renewable alternative for the same capacity identified”. The result of this comparative assessment is published and is subject to a stakeholder consultation.</p> <p><b>Reviewed</b></p>	<p><b>Summary: Renewable energy can replace coal-fired power plants with lower greenhouse gas emissions than gas-fired power plants and at a lower cost. This vague criterion does not capture this reality.</b></p> <p>This criterion is vague and can have very different impacts depending on how it is defined. For example, the criterion does not specify how the “cost effectiveness” and “feasibility” of replacement will be evaluated, nor how the environmental benefits from renewables will be integrated to this assessment.</p> <p>Renewable energy emits far less greenhouse gas than gas-fired plants and can provide electricity <a href="#">at a lower cost</a>. Even taking into account the need for electricity storage and grid flexibility, renewables can be far more competitive than gas-fired power plants coupled with CO<sub>2</sub> capture, as recent assessments by <a href="#">Australia's CSIRO show</a>, for example. As <a href="#">Carbon Tracker</a> and the <a href="#">Global Energy Monitor</a> indicate, most new gas infrastructure built would not be economically viable and/or could generate significant amounts of stranded assets.</p> <p>If the result of the assessment must be published and subjected to stakeholder consultation, ensuring that every project effectively complies with this criterion would require a massive involvement of NGOs and civil society. Furthermore, the criterion itself makes economical considerations prevail on environmental ones.</p>
<p>Compatibility with low-carbon gases and a commitment and verifiable plan to shift to 100% “low carbon gases” by the end of 2035</p> <p><b>Weakened</b></p>	<p><b>Summary: This criterion looks like yet another diversion attempt. It simply aims to signal that new power plants will no longer run on fossil gas by 2035, even though such an eventuality is unlikely and would remain a major problem for the European transition.</b></p> <p>With this criterion, new gas power plants could continue to run 100% on fossil gas until 2035, thus emitting important amounts of GHG until then. The intermediary targets for the blending of fossil gas with “low-carbon gases” (30% by 2026 and 55% by 2030) set in the draft DA from December 31<sup>st</sup> have been removed.</p>

Moreover, this criterion implies that hydrogen and other so-called "low-carbon" gases will increasingly be used in new gas-fired power plants. However, there are doubts about the availability of these gases in the short/medium term, which could call into question the real application of this criterion. Today, only [1% of the gas produced](#) worldwide is biomethane or biogas and [0.5% of the hydrogen](#) production is green hydrogen.

Above all, as the industrial sectors are already betting massively on these so-called "low carbon" gases to decarbonize their production, the use of these gases in power plants is very inefficient or even counterproductive: [Bellona Europe](#) indicates that a power plant using 100% green hydrogen could consume 2.8 times the energy it produces. Renewable energies are therefore to be preferred for electricity production.

The lack of a precise definition of "low carbon" gas also means that some biogases with a high carbon footprint or "blue" hydrogen - generated from fossil fuels - could be used.

Analysis of the criteria for nuclear

Criteria	Reclaim Finance’s analysis
<p>Building permits granted by 2045 for new reactors</p>	<p><b>Summary: <i>The length of time that nuclear power plants take to be built makes them inadequate to deliver the GHG emission reductions needed in the short to medium term. However, new reactors will continue to be used well after 2050, challenging the narrative of a transitional activity.</i></b></p> <p>In its 1.5°C report, the IPCC mentions a 10 to 19 year delay between the decision to build a plant and its commissioning. According to the <a href="#">World Nuclear Report 2021</a>, the 63 nuclear reactors that came on line between 2011 and 2020 took an average of 9.9 years to build. Delays are frequent: they concern 31 of the 53 nuclear units currently under construction, and 10 of these construction sites date back a decade or more. In France, the Flamanville EPR project started 15 years ago and is now more than ten years behind schedule, notably triggering the <a href="#">life extension of a coal power plant</a>.</p> <p>As a result, some power plants licensed until 2045 will not start operating until well after 2050. Even the first reactors that benefit from the taxonomy classification - which would begin construction as early as 2022-2023 - will not provide electricity for at least a decade and thus will not contribute to the necessary reduction of GHG emissions by 2030. While nuclear power plants are being built, states and companies will continue to rely on their GHG-intensive fossil fuel plants.</p> <p>Moreover, nuclear power plants have a long life span, estimated between 40 and 60 years depending on the type of reactor and the possibility of extension, which commits states over a long period of time. It can be estimated that the plants built under this criterion will close at the earliest in 2070, and probably much later, even after 2100. Nuclear power plants can therefore hardly be seen as "transitional" activities that would allow for a temporary contribution, especially while waiting for a massive deployment of renewable energies and the implementation of an energy sobriety approach.</p> <p>All of these elements call into question the status of transitional activity granted to new reactors that will arrive too late to allow the necessary reduction in emissions in the short and medium term, while remaining in operation for decades.</p>
<p>Management and storage of waste in the member state where it was generated or in a partner member state</p>	<p><b>Summary: <i>The EU member states will have to take responsibility for the storage of the radioactive waste they produced.</i></b></p> <p>Today, nuclear waste is stored in inadequate interim facilities and in some cases may even be exported abroad. This criterion should theoretically prevent such exports and oblige member states to assume responsibility for their radioactive waste themselves.</p> <p>However, EDF has been <a href="#">exporting radioactive waste to Russia</a> by circumventing French law, which prohibits the export of such waste but allows it if it is presented as a material that can still be processed, even though it is stored for long periods without being transformed. As it stands, the criterion does not prevent this type of practices and should be clarified.</p>
<p>Plan for the disposal of high-level radioactive waste (for reactors already in operation, this plan is only required for</p>	<p><b>Summary: <i>Today, Finland and France appear to be the only two states able to meet this criterion in the EU. However, given the long time given to states to have actually operational facilities, the impact of this criterion will depend largely on the requirements set by the Commission for the waste disposal plans.</i></b></p>



<p>projects authorized after 2025)</p>	<p>This criterion requires the development of operational geological disposal capacity by 2050 for the most radioactive waste. Today, only Finland and France have relatively advanced geological disposal projects that would meet this criterion. The French Cigéo project remains widely criticized and its construction has not yet begun. In other EU countries, the development of such capacities is particularly uncertain.</p> <p>If applied drastically to ensure the credibility of storage plans, this criterion could significantly restrict the scope of nuclear projects benefiting from taxonomy-aligned funding. However, the 2050 date seems remote, leaving high-level radioactive waste to accumulate in inadequate infrastructures for at least 30 years and reinforcing the uncertainties surrounding the concretization of disposal plans.</p>
<p>Storage of low and intermediate level radioactive waste already available</p>	<p><b>Summary: This criterion is intended to ensure that low- and intermediate-level waste is stored and is expected to have a limited impact.</b></p> <p>In the absence of specifics, this criterion is expected to have a limited impact. While some specific sites exist, it is also common practice to store low- and intermediate-level waste at nuclear power plant sites and/or in interim facilities. The criterion is not expected to significantly change these practices.</p>
<p>Creation of funds for waste management and the dismantling of reactors</p>	<p><b>Summary: By making it mandatory to account for the cost of waste management and the dismantling of reactor, the Commission could force states to better consider the real cost of nuclear energy. However, several uncertainties remain.</b></p> <p>As the work of <a href="#">the French court of accounts</a> has shown, nuclear power plant operators and governments have had difficulties taking into account the cost of processing and storing nuclear waste and dismantling power plants.</p> <p>Yet this cost is particularly important, especially in the context of geological disposal of highly radioactive waste. The cost of construction of the major French geological storage project Cigéo has been set at 25 billion euros, but had previously been estimated at 34.5 billion by the national agency responsible for radioactive waste management (ANDRA). In Finland, the Onkalo storage project is estimated at 2.6 billion euros. In addition to these construction costs, there are other costs that increase with the volume of waste generated, such as the cost of treating the waste and managing the repository over its entire lifespan, i.e. potentially over several hundred years.</p> <p>The cost of dismantling is also major. According to a 2017 <a href="#">parliamentary report</a>, EDF estimated in 2015 that dismantling its 58 reactors would cost more than 30 billion euros. According to the same report, European nuclear operators make provisions of 900 million to 1.3 billion for the dismantling of a reactor.</p> <p>This criterion should therefore lead to a better reflection of the full cost of nuclear energy while ensuring - at least partially - the financing of the storage plans requested. However, the methods for calculating the amounts to be set aside for waste management and reactor dismantling and the method for calculating the final costs of these activities are not specified.</p> <p>Moreover, the fact that member states must also demonstrate that they will have “resources available at the end of the estimated useful life of the nuclear power plant corresponding to the estimated cost of radioactive waste management and decommissioning” is not reassuring as it mainly requires compliance with Euratom recommendations.</p>

<p>Report to the European Commission every 5 years on the storage plan and the funds dedicated to storage and decommissioning</p>	<p><b>Summary: The European Commission will be responsible for monitoring the implementation of the radioactive waste disposal plan and the constitution of specific financial provisions.</b></p> <p>This criterion makes the European Commission the body that controls the storage plans requested from the States and the provisions made to ensure this management and the dismantling of the reactors. However, the Commission's powers of sanction are not explicit and should be clarified to guarantee effective control.</p>
<p>Use of accident-tolerant fuel from 2025.</p> <p><b>New</b></p>	<p><b>Summary: This new criterion merely requires nuclear plants to run with best-available fuels after 2025. This does not improve the sustainability of the technology.</b></p> <p>After Fukushima, “accident-tolerant” fuels have been touted by the nuclear industry to reduce the risks of accidents. Such fuels are still being researched and not deployed at large scale. In the “best-case scenario”, they will contribute to nuclear safety but do not improve the sustainability of the technology.</p>