

GS SUSTAIN

EU Taxonomy Update - Inclusion of Natural Gas and Nuclear

The European Commission has released new plans to include some natural gas and nuclear energy power plants as 'green' under the existing EU Taxonomy's Climate Change Mitigation objective. Despite the political pressure the new proposal appears likely to pass, leading to implications for corporates and investors. We believe the inclusion of natural gas and nuclear power generation would help provide some guarantee to Europe's volatile energy supply, especially as renewables scale and potentially provide an incentive for natural gas to play a larger role in Big Oils transition to Big Energy, helping drive an acceleration in the phasing out of coal. Investors' recognition of nuclear and gas-fired powered generation as green is likely to remain somewhat tempered by existing exclusions in ESG funds, but their inclusion into the EU Taxonomy now opens the door to more nuanced views, potentially giving more credit to the technologies where they meet the strict performance criteria of the Taxonomy.

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Implications of Natural Gas and Nuclear Inclusion into the EU Taxonomy

The European Commission has released new plans to include some natural gas and nuclear energy power plants as 'green' under the existing EU Taxonomy's Climate Change Mitigation and Adaptation objective. The Taxonomy aims to define which economic activities are green by establishing strict carbon performance thresholds, requiring companies to disclose their 'green' revenue, capex and opex and investors to report their exposure to 'green' companies in ESG funds. The intention of the Taxonomy is to facilitate the flow of capital towards more sustainable outcomes.

Below we highlight some of the detail and implications from the draft of Natural Gas and Nuclear's inclusion into the EU Taxonomy.

What's included?: The draft includes pathways for:

- **Nuclear energy production**, including R&D of new advanced nuclear technology, new nuclear power plants with permits received before 2045, and existing nuclear facilities to be considered 'green'.
- **Natural gas power plants** to be considered 'transitional' and green if: **1) existing facilities** produce energy below 100g CO₂e per kWh (requiring CCS technology), or if **2) new facilities** produce emissions below 270g CO₂e per kWh + replace higher emitting facilities (**where renewables are not yet viable**) + only where permits are received before December 31, 2030.

For more detail on the technical screening criteria for each activity please see the Appendix ([Exhibit 1](#) - [Exhibit 6](#)).

Next steps: The EC proposals asks EU Member States and the Platform on Sustainable Finance to provide feedback by January 12th, a much shorter timeline than typical legislative proposals. The EU Commission will then take their contributions and adopt the Delegated Act in January 2022. The European Parliament and Council will then have four months (including a potential extra two) to object to the Delegated Act before it automatically enters into force. If adopted the new Delegated Act would apply from Jan 1st, 2023.

Likelihood of passing: *The inclusion of Natural Gas and Nuclear power production into the Taxonomy appears highly likely.* The topic has been debated for more than a year and has received significant scrutiny from Member States. Germany and Austria remain critical of the inclusion of nuclear energy, while Germany (non-Green party) along with eastern European countries want gas included. France, Finland and Czech Republic are advocates for inclusion of nuclear and remain largely agnostic towards inclusion of gas. Despite the divide it is expected that neither side will have the required 20 countries (65% population of EU) or simple majority in Parliament to block the proposal, which would then see both Gas and Nuclear power included into the Taxonomy.

Our views and implications for corporates and investors:

- **Investor recognition of nuclear and gas power as green will become more nuanced, potentially beginning a shift away from traditional hardline investment exclusions.** Many ESG funds and ESG fund labeling schemes include hardline exclusions around companies with nuclear or fossil fuel exposure that are likely to remain in place. Therefore, even if natural gas and nuclear are included in the Taxonomy, we see investors remaining critical of supporting such technologies outright. However, inclusion into the Taxonomy would add more nuance to the ESG debate and exclusion exceptions may be made where companies with nuclear or gas exposure meet the strict Taxonomy criteria.
- **Gas and nuclear inclusion would help provide guarantee of energy supply to Europe as renewables scale, especially given the existing volatility in energy supply.** We believe inclusion of nuclear and gas into the Taxonomy would help to ensure a smoother transition to a low carbon economy.
- **The recognition of pre-commercial R&D into advanced nuclear technology could provide incentives to develop potential ‘game changing’ energy technology.**
- **The inclusion of existing and new nuclear plants as green could serve as a potential backstop technology for achieving net-zero pathways, especially as renewables, storage, and hydrogen take time to scale.**
- **Inclusion could provide a further incentive for Big Oil to accelerate their transformation to Big Energy, with potentially a bigger role in gas fired power generation as part of their broader power expansion.** Given that revenue generated directly from natural gas and oil exploration and production are not included in the Taxonomy, **the inclusion of natural gas fired power generation could further incentivize Big Oil’s downstream investment into natural gas power production via capex or targeted acquisitions.** Expansion into natural gas power production could expand the revenue mix of Big Oils that could be considered eligible and potentially aligned (green) to the EU Taxonomy. An estimated 33% of natural gas production revenue is linked to power production in Europe, though only incremental gas power replacing coal or existing plants with CCS technology would be covered. This would expand on the existing business activities of petrochemicals, biofuel production, hydrogen production, carbon sequestration, and renewable energy that are already included in the EU Taxonomy.

As highlighted in our **Green Capex: Making Infrastructure Happen** report, we believe meeting Net Zero requires a diverse set of technologies that includes nuclear and carbon capture. The inclusion by the EU Taxonomy of natural gas (with restrictions that will likely warrant carbon capture) and nuclear should provide greater incentive for investment in these areas. Overall, we believe we will need to see \$6.0 trillion per year of Green Capex to support Net Zero, infrastructure and Clean Water (\$3.0 trillion/year

towards Net Zero), up \$2.8 trillion vs. the annual average in 2016-20 (\$1.8 trillion of the incremental towards Net Zero).

Appendix

Exhibit 1: Pre-commercial stages of advanced technologies with minimal waste from the fuel cycle

Description of the activity and Technical screening criteria

Pre-commercial stages of advanced technologies with minimal waste from the fuel cycle	
Description of the activity	Research, development, demonstration and deployment of innovative electricity generation facilities, licenced by Member States' competent authorities in accordance with applicable national law, that produce energy from nuclear processes with minimal waste from the fuel cycle.
Technical screening criteria	<p>General criteria pertaining to substantial contribution to climate change mitigation and Do no significant harm ('DNSH')</p> <p>1. The project related to the economic activity ('the project') is located in a Member State which complies with all of the following:</p> <ul style="list-style-type: none"> (a) has fully transposed Council Directive 2009/71/Euratom and Council Directive 2011/70/Euratom; (b) complies with the Euratom Treaty and the Union legislation adopted on its basis, in particular, Council Directive 2009/71/Euratom, Council Directive 2013/59/Euratom, and Council Directive 2011/70/Euratom as well as applicable Union environmental law adopted under Article 192 TFEU, in particular Directive 2011/92/EU; (c) has in place, as of the approval date of the project, a radioactive waste management fund and a nuclear decommissioning fund which can be combined; (d) has demonstrated 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 in compliance with Commission Recommendation 2006/851/Euratom; (e) has operational final disposal facilities for all very low-, low- and intermediate-level radioactive waste, notified to the Commission both under Article 41 Euratom Treaty and included in the national programme updated under Council Directive 2011/70/Euratom; (f) has a plan with detailed steps to have in operation, by 2050, a disposal facility for high-level radioactive waste. <p>2. The project is part of a EU-financed research programme or the project has been notified to the Commission, the Commission has given its opinion on it and all the issues raised in the opinion in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed. No separate notification is required where the project has been notified in accordance with Article 41 of the Euratom Treaty, the Commission has communicated its views in accordance with Article 43 of the Euratom Treaty and all the issues raised by the Commission in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed.</p> <p>3. The Member State concerned has committed to report to the Commission every five years for each project:</p> <ul style="list-style-type: none"> (a) the adequacy of the accumulated resources referred to in point 1(c); (b) actual progress in the implementation of the plan referred to in point 1(f). <p>4. The activity complies with national legislation that transposes the Union legislation referred to in point 1(a) and (b), including as regards the evaluation, in particular through stress tests, of the resilience of the Union nuclear power plants against extreme natural hazards, including earthquakes. Accordingly, the activity takes place on the territory of a Member State where the operator of a nuclear installation:</p> <ul style="list-style-type: none"> (a) has submitted a demonstration of nuclear safety, whose scope and level of detail is commensurate with the potential magnitude and nature of the hazard relevant for the nuclear installation and its site (Article 6, point (b), of Directive 2009/71/Euratom); (b) has taken defence-in-depth measures to ensure, inter alia, that the impact of extreme external natural and unintended man-made hazards is minimised (Article 8b(1), point (a) of Directive 2009/71/Euratom); (c) has performed an appropriate site and installation-specific assessment when the operator concerned applies for a licence to construct or operate a NPP (Article 8c(1) of Directive 2009/71/Euratom). <p>The activity fulfils the requirements of the of Directive 2009/71/Euratom, supported by the latest international guidance through IAEA and WENRA, contributing to increasing the resilience of the ability of new and existing NPPs to cope with extreme natural hazards, including floods and extreme weather conditions.</p> <p>5. Radioactive waste referred to in points (e) and (f) of paragraph 1 is disposed of in the Member State in which it was generated, unless there is an agreement between the Member State concerned and the Member State of destination, as established in Directive 2011/70/Euratom. In this case, the Member State of destination has radioactive waste management and disposal programmes and a suitable disposal facility in operation in compliance with the requirements of Directive 2011/70/Euratom.</p> <p>Additional criteria pertaining to substantial contribution to climate change mitigation</p> <p>The activity aims at generating or generates electricity using nuclear energy. Life cycle greenhouse gas (GHG) emissions from the generation of electricity from nuclear energy below the threshold of 100 g CO₂e/kWh.</p> <p>Life cycle GHG emission savings calculated using Commission Recommendation 2013/179/EU20on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018.</p> <p>Quantified life cycle GHG emissions are verified by an independent third party.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 2: Construction and safe operation of new nuclear power plants, for the generation of electricity or heat, including for hydrogen production, using best-available technologies

Description of the activity and Technical screening criteria

Construction and safe operation of new nuclear power plants, for the generation of electricity or heat, including for hydrogen production, using best-available technologies	
Description of the activity	Construction and safe operation of new nuclear installations, for which the construction permit has been issued by 2045 by Member States' competent authorities in accordance with applicable national law, to produce electricity and/or, process heat, including for the purposes of district heating or industrial processes such as hydrogen production (new nuclear installations or NNIs), as well as their safety upgrades.
Technical screening criteria	<p style="text-align: center;">General criteria pertaining to substantial contribution to climate change mitigation and Do no significant harm ('DNSH')</p> <p>1. The project related to the economic activity ('the project') is located in a Member State which complies with all of the following:</p> <ul style="list-style-type: none"> (a) has fully transposed Council Directive 2009/71/Euratom and Council Directive 2011/70/Euratom; (b) complies with the Euratom Treaty and the Union legislation adopted on its basis, in particular, Council Directive 2013/59/Euratom, Council Directive 2009/71/Euratom and Council Directive 2011/70/Euratom as well as applicable Union environmental law adopted under Article 192 TFEU, in particular Directive 2011/92/EU; (c) has in place, as of the approval date of the project, a radioactive waste management fund and a nuclear decommissioning fund which can be combined; (d) has demonstrated 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 in compliance with Commission Recommendation 2006/851/Euratom; (e) has operational final disposal facilities for all very low-, low- and intermediate level radioactive waste, notified to the Commission both under Article 41 of the Euratom Treaty and included in the national programme updated under Council Directive 2011/70/Euratom; (f) has a plan with detailed steps to have in operation, by 2050, a disposal facility for high-level radioactive waste. <p>2. The project fully applies the best-available technology and accident-tolerant fuel. The technology is certified and approved by the national safety regulator.</p> <p>3. The project has been notified to the Commission, the Commission has given its opinion on it and all the issues raised in the opinion in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed. No separate notification is required where the project has been notified in accordance with Article 41 of the Euratom Treaty, the Commission has communicated its views in accordance with Article 43 of the Euratom Treaty and all the issues raised by the Commission in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed.</p> <p>4. The Member State concerned has committed to report to the Commission every five years for each project:</p> <ul style="list-style-type: none"> (a) the adequacy of the accumulated resources referred to in point 1(c); (b) actual progress in the implementation of the plan referred to in point 1(f). <p>5. The Commission shall review starting in 2025 and at least every 10 years the technical parameters corresponding to the best-available technology on the basis of the assessment by the European Nuclear Safety Regulators' Group (ENSREG).</p> <p>6. The activity complies with national legislation that transposes the Union legislation referred to in point 1 (a) and (b), including as regards the evaluation, in particular through stress-tests, of the resilience of the Union nuclear power plants against extreme natural hazards, including earthquakes. Accordingly, the activity takes place on the territory of a Member State where the operator of a nuclear installation:</p> <ul style="list-style-type: none"> (a) has submitted a demonstration of nuclear safety, whose scope and level of detail is commensurate with the potential magnitude and nature of the hazard relevant for the nuclear installation and its site (Article 6, point (b), of Directive 2009/71/Euratom); (b) has taken defence-in-depth measures to ensure, inter alia, that the impact of extreme external natural and unintended man-made hazards is minimised (Article 8b(1), point (a), of Directive 2009/71/Euratom); (c) has performed an appropriate site and installation-specific assessment when the operator concerned applies for a licence to construct or operate a NPP (Article 8c(1) of Directive 2009/71/Euratom). <p>The activity fulfils the requirements of Directive 2009/71/Euratom, supported by the latest international guidance through IAEA and WENRA, contributing to increasing the resilience of the ability of new and existing NPPs to cope with extreme natural hazards, including floods and extreme weather conditions.</p> <p>7. Radioactive waste referred to in points (e) and (f) of paragraph 1 is disposed of in the Member State in which it was generated, unless there is an agreement between the Member State concerned and the Member State of destination, as established in Directive 2011/70/Euratom. In this case, the Member State of destination has radioactive waste management and disposal programmes and a suitable disposal facility in operation in compliance with the requirements of Directive 2011/70/Euratom.</p> <p style="text-align: center;">Additional criteria pertaining to substantial contribution to climate change mitigation</p> <p>The activity generates electricity using nuclear energy. Life cycle greenhouse gas (GHG) emissions from the generation of electricity from nuclear energy below the threshold of 100 g CO₂e/kWh.</p> <p>Life cycle GHG emission savings calculated using Commission Recommendation 2013/179/EU36 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018.</p> <p>Quantified life cycle GHG emissions are verified by an independent third party.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 3: Electricity generation from nuclear energy in existing installations

Description of the activity and Technical screening criteria

Electricity generation from nuclear energy in existing installations	
Description of the activity	Modification of existing nuclear installations for the purposes of extension, authorised by Member States' competent authorities by 2040 in accordance with applicable national law, of the service time of safe operation of electricity generation facilities that produce electricity from nuclear energy ('nuclear power plants' or 'NPPs').
Technical screening criteria	<p style="text-align: center;">General criteria pertaining to substantial contribution to climate change mitigation and Do no significant harm ('DNSH')</p> <p>1. The project related to the economic activity ('the project') is located in a Member State which complies with all of the following:</p> <ul style="list-style-type: none"> (a) has fully transposed Council Directive 2009/71/Euratom and Council Directive 2011/70/Euratom; (b) complies with the Treaty establishing the European Atomic Energy Community ('Euratom Treaty') and the Union legislation adopted on its basis, in particular, Council Directive 2013/59/Euratom, Council Directive 2009/71/Euratom, and Council Directive 2011/70/Euratom as well as applicable Union environmental law adopted under Article 192 TFEU, in particular Directive 2011/92/EU of the European Council and of the Parliament; (c) has in place, as of the approval date of the project, a radioactive waste management fund and a nuclear decommissioning fund which can be combined; (d) has demonstrated 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 in compliance with Commission Recommendation 2006/851/Euratom; (e) has operational final disposal facilities for all very low-, low- and intermediate-level radioactive waste, notified to the Commission both under Article 41 of the Euratom Treaty and included in the national programme updated under Council Directive 2011/70/Euratom; (f) has for projects authorised after 2025 a plan with detailed steps to have in operation, by 2050, a disposal facility for high-level radioactive waste. <p>2. The upgraded project implements any reasonably practicable safety improvement and makes use of accident-tolerant fuel. The technology is certified and approved by the national safety regulator.</p> <p>3. The project has been notified to the Commission, the Commission has given its opinion on it and all the issues raised in the opinion in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed. No separate notification is required where the project has been notified in accordance with Article 41 of the Euratom Treaty, the Commission has communicated its views in accordance with Article 43 of the Euratom Treaty and all the issues raised by the Commission in respect of the application of Article 10(2), Article 17 of Regulation (EU) 2020/852 and of the technical screening criteria laid down in this Section have been satisfactorily addressed.</p> <p>4. The Member State concerned has committed to report to the Commission every five years for each project:</p> <ul style="list-style-type: none"> (a) the adequacy of the accumulated resources referred to in point 1(c); (b) actual progress in the implementation of the plan referred to in point 1(f). <p>5. The activity complies with national legislation that transposes the Union legislation referred to in point 1(a) and (b), including as regards the evaluation, in particular through stress-tests, of the resilience of the Union nuclear power plants against extreme natural hazards, including earthquakes. Accordingly, the activity takes place on the territory of a Member State where the operator of a nuclear installation:</p> <ul style="list-style-type: none"> (a) has submitted a demonstration of nuclear safety, whose scope and level of detail is commensurate with the potential magnitude and nature of the hazard relevant for the nuclear installation and its site (Article 6, point (b), of Directive 2009/71/Euratom); (b) has taken defence-in-depth measures to ensure, inter alia, that the impact of extreme external natural and unintended man-made hazards is minimized (Article 8b(1), point (a), of Directive 2009/71/Euratom); (c) has performed an appropriate site and installation-specific assessment when the operator concerned applies for a licence to construct or operate a NPP (Article 8c(1) of Directive 2009/71/Euratom). <p>The activity fulfils the requirements of Directive 2009/71/Euratom, supported by the latest international guidance through IAEA and WENRA, contributing to increasing the resilience of the ability of new and existing NPPs to cope with extreme natural hazards, including floods and extreme weather conditions.</p> <p>6. Radioactive waste referred to in points (e) and (f) of paragraph 1 is disposed of in the Member State in which it was generated, unless there is an agreement between the Member State concerned and the Member State of destination, as established in Directive 2011/70/Euratom. In this case, the Member State of destination has radioactive waste management and disposal programmes and a suitable disposal facility in operation in compliance with the requirements of Directive 2011/70/Euratom.</p> <p style="text-align: center;">Additional criteria pertaining to substantial contribution to climate change mitigation</p> <p>The activity generates electricity using nuclear energy. Life cycle greenhouse gas (GHG) emissions from the generation of electricity from nuclear energy below the threshold of 100 g CO₂e/kWh.</p> <p>Life cycle GHG emission savings calculated using Commission Recommendation 2013/179/EU52 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018.</p> <p>Quantified life cycle GHG emissions are verified by an independent third party.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 4: Electricity generation from fossil gaseous fuels

Description of the activity and Technical screening criteria

Electricity generation from fossil gaseous fuels	
Description of the activity	Construction or operation of electricity generation facilities that produce electricity using fossil gaseous fuels. This activity does not include electricity generation from the exclusive use of renewable non-fossil gaseous and liquid fuels referred to in Section 4.7 of this Annex and biogas and bio-liquid fuels referred to in Section 4.8 of this Annex.
Technical screening criteria	<p style="text-align: center;">Substantial contribution to climate change mitigation</p> <p>1. The activity meets either of the following criteria:</p> <p>a) Life-cycle GHG emissions from the generation of electricity using fossil gaseous fuels are lower than 100 g CO₂e/kWh.</p> <p>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 CO₂ that would otherwise be emitted from the electricity generation process is captured for the purpose of underground storage, the CO₂ is transported and stored underground, in accordance with the technical screening criteria set out in Sections 5.11 and 5.12 of this Annex.</p> <p>b) for facilities, for which the construction permit is granted by 31 December 2030:</p> <p>i. direct GHG emissions of the activity are lower than 270 g CO₂e/kWh of the output energy, or annual GHG emissions of the activity do not exceed an average of 550 kg CO₂e/kW of the output energy of the facility's capacity over 20 years, and</p> <p>ii. the power generated by the activity may not yet efficiently be replaced by power generated from renewable energy sources, for the same capacity, and</p> <p>iii. the facility replaces an existing high emitting electricity generation facility that uses solid or liquid fossil fuels, and</p> <p>iv. the production capacity of the facility does not exceed the capacity of the replaced facility by more than 15%, and</p> <p>v. the facility demonstrates compatibility with co-firing of low carbon gaseous fuels and there are effective plans or commitments, approved by the management body, to use at least 30% of renewable or low-carbon gases as of 1 January 2026, and at least 55% of renewable or low-carbon gases as of 1 January 2030, and to switch to renewable or low-carbon gases and the switch takes place by 31 December 2035, and</p> <p>vi. the replacement leads to a reduction in emissions of at least 55% GHG per kWh of output energy, and</p> <p>vii. the activity takes place on the territory of a Member State that has committed to phase-out the use of energy generation from coal and has reported this in its integrated national energy and climate plan referred to in Article 3 of Regulation EU/2018/1999 or in another instrument.</p> <p>Compliance with the above criteria is verified by an independent third party. In particular, every year the independent third party shall publish and transmit to the Commission a report certifying the level of direct GHG emissions referred to in point i) or assessing whether the lifecycle annual GHG emissions of the activity are on a credible trajectory to comply with the average threshold over 20 years referred to in point i). On the basis of the reports transmitted to it, the Commission may address an opinion to the relevant operators. The Commission shall take those reports into account when performing the review referred to in Article 19(5) of Regulation (EU) 2020/852.</p> <p>2. The activity meets either of the following criteria:</p> <p>(a) at construction, measurement equipment for monitoring of physical emissions, such as those from methane leakage, is installed or a leak detection and repair programme is introduced;</p> <p>(b) at operation, physical measurement of emissions are reported and leak is eliminated.</p> <p>3. Where the activity blends fossil gaseous fuels with gaseous or liquid biofuels, the agricultural biomass used for the production of the biofuels complies with the criteria laid down in Article 29, paragraphs 2 to 5, of Directive (EU) 2018/2001 while forest biomass complies with the criteria laid down in Article 29, paragraphs 6 and 7, of that Directive.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 5: High-efficiency co- generation of heat/cool and power from fossil gaseous fuels

Description of the activity and Technical screening criteria

High-efficiency co- generation of heat/cool and power from fossil gaseous fuels	
Description of the activity	Construction, refurbishment, and operation of combined heat/cool and power generation facilities using gaseous fuels. This activity does not include high-efficiency co-generation of heat/cool and power from the exclusive use of renewable non-fossil gaseous and liquid fuels referred to in Section 4.19 of this Annex, and biogas and bio-liquid fuels referred to in Section 4.20 of this Annex.
Technical screening criteria	<p style="text-align: center;">Substantial contribution to climate change mitigation</p> <p>1. The activity meets either of the following criteria:</p> <p>a) The life-cycle GHG emissions from the co-generation of heat/cool and power from gaseous fuels are lower than 100 g CO₂e per 1 kWh of energy output of the co-generation.</p> <p>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.</p> <p>Where facilities incorporate any form of abatement, including carbon capture or use of decarbonised fuels, that abatement activity complies with the relevant Sections of this Annex, where applicable. Where the CO₂ emitted from the electricity generation is captured, the CO₂ shall meet the emissions limit set out in point 1 of this Section and, the CO₂ be transported and stored underground in a way that meets the technical screening criteria for transport of CO₂ and storage of CO₂ set out in Sections 5.11 and 5.12, respectively of this Annex.</p> <p>b) for facilities, for which the construction permit is granted by 31 December 2030:</p> <p>i. the activity achieves primary energy savings of at least 10% compared with the references to separate production of heat and electricity; the primary energy savings are calculated on the basis of formula provided in Directive 2012/27/EU, and</p> <p>ii. direct GHG emissions of the activity are lower than 270 g CO₂e/kWh of the output energy, and</p> <p>iii. the power and heat generated by the activity may not yet efficiently be replaced by power and heat generated from renewable energy sources, for the same capacity, and</p> <p>iv. the facility replaces an existing high emitting combined heat/cool and power generation facility, a separate heat/cool generation facility, or a separate power generation facility that uses solid or liquid fossil fuels, and</p> <p>v. the production capacity of the facility does not exceed the capacity of the replaced facility, and</p> <p>vi. the facility demonstrates compatibility with co-firing of low carbon gaseous fuels and there are effective plans or commitments, approved by the management body, to use at least 30% of renewable or low-carbon gases as of 1 January 2026, and at least 55% of renewable or low-carbon gases as of 1 January 2030, and to switch to renewable or low-carbon gases and the switch takes place by 31 December 2035, and</p> <p>vii. the replacement leads to a reduction in emissions of at least 55% GHG per kWh of output energy, and</p> <p>viii. the refurbishment of the facility does not increase production capacity of the facility, and</p> <p>ix. the activity takes place on the territory of a Member State that has committed to phase-out the use of energy generation from coal and has reported this in its integrated national energy and climate plan referred to in Article 3 of Regulation EU/2018/1999 or in another instrument.</p> <p>Compliance with the above criteria is verified by an independent third party.</p> <p>2. The activity meets either of the following criteria:</p> <p>(a) at construction, measurement equipment for monitoring of physical emissions, such as those from methane leakage, is installed or a leak detection and repair program is introduced;</p> <p>(b) at operation, physical measurement of emissions are reported and any leak is eliminated.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 6: Production of heat/cool from fossil gaseous fuels in an efficient district heating and cooling system

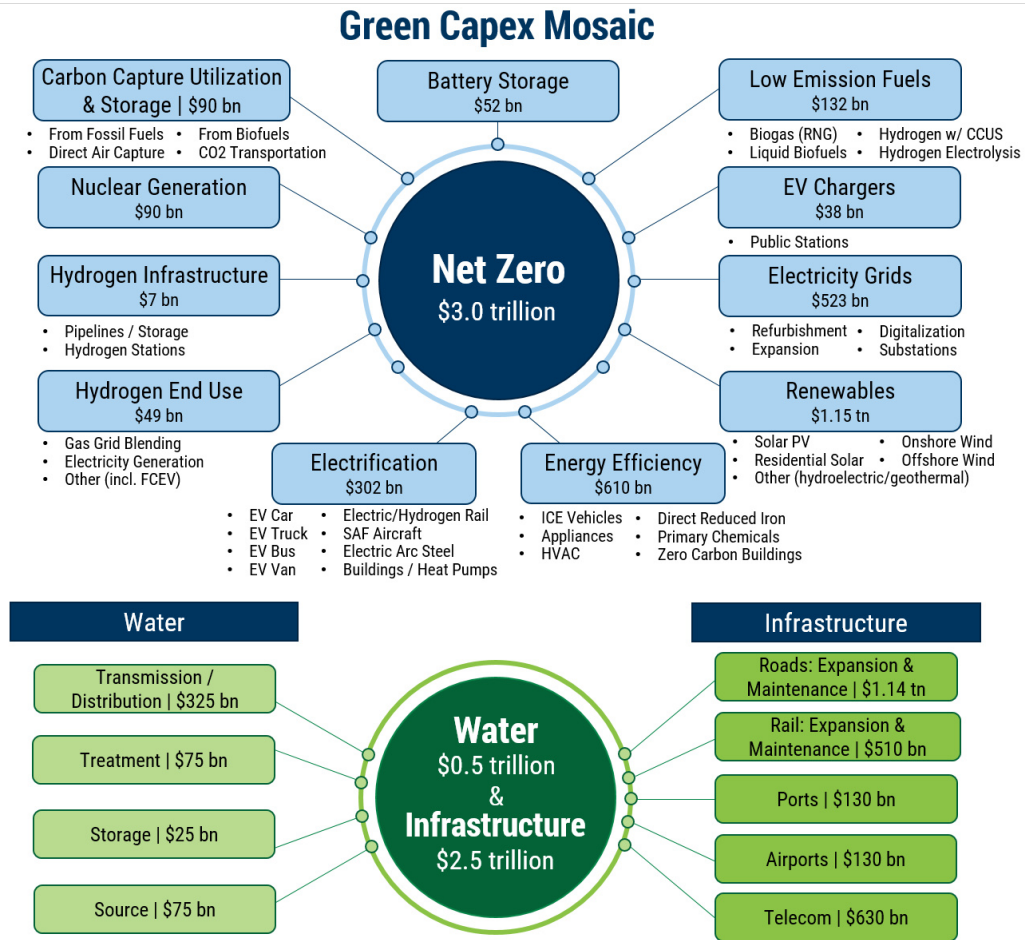
Description of the activity and Technical screening criteria

Production of heat/cool from fossil gaseous fuels in an efficient district heating and cooling system	
Description of the activity	Construction, refurbishment and operation of heat generation facilities that produce heat/cool using gaseous fuels connected to efficient district heating and cooling within the meaning of Article 2(41) of Directive 2012/27/EU of the European Parliament and of the Council. This activity does not include production of heat/cool from in an efficient district heating from the exclusive use of renewable non-fossil gaseous and liquid fuels referred to in Section 4.23 of this Annex and biogas and bio-liquid fuels referred to in Section 4.24 of this Annex.
Technical screening criteria	<p style="text-align: center;">Substantial contribution to climate change mitigation</p> <p>1. The activity meets either of the following criteria:</p> <p>a) Life-cycle GHG emissions from the generation of heat/cool from gaseous fuels are lower than 100 g CO₂e/kWh.</p> <p>Life-cycle GHG emission savings are calculated using Commission Recommendation 2013/179/EU73 or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018.</p> <p>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 relevant Sections of this Annex, where applicable. Where the CO₂ emitted from the electricity generation is captured, the CO₂ shall meet the emissions limit set out in point 1 of this Section and shall be transported and stored underground in a way that meets the technical screening criteria for transport of CO₂ and storage of CO₂ set out in Sections 5.11 and 5.12, respectively of this Annex.</p> <p>b) for facilities, for which the construction permit is granted by 31 December 2030:</p> <p>i. The thermal energy generated by the activity is used in an efficient district heating and cooling system as defined in Directive 2012/27/EU, and</p> <p>ii. the direct GHG emissions of the activity are lower than 270 g CO₂e/kWh of the output energy, and</p> <p>iii. the thermal energy generated by the activity may not yet credibly be replaced efficiently by thermal energy generated from renewable energy sources, for the same capacity, and</p> <p>iv. the facility replaces an existing high emitting heating/cooling facility using solid or liquid fossil fuel, and</p> <p>v. the production capacity of the facility does not exceed the capacity of the replaced facility, and</p> <p>vi. the facility demonstrates compatibility with co-firing of low carbon gaseous fuels and there are effective plans or commitments, approved by the management body, to use at least 30% of renewable or low-carbon gases as of 1 January 2026, and at least 55% of renewable or low-carbon gases as of 1 January 2030, and to switch to renewable or low-carbon gases and the switch takes place by 31 December 2035, and</p> <p>vii. the replacement leads to a reduction in emissions of at least 55% GHG per kWh of output energy; and</p> <p>viii. the refurbishment of the facility does not increase production capacity of the facility, and</p> <p>ix. the activity takes place on the territory of a Member State that has committed to phase-out the use of energy generation from coal and has reported this in its integrated national energy and climate plan referred to in Article 3 of Regulation EU/2018/1999 or in another instrument.</p> <p>Compliance with the above criteria is verified by an independent third party.</p> <p>2. The activity meets either of the following criteria:</p> <p>(a) at construction, measurement equipment for monitoring of physical emissions, such as those from methane leakage, is installed or a leak detection and repair program is introduced;</p> <p>(b) at operation, physical measurement of emissions are reported and any leak is eliminated.</p>

Source: European Commission, Goldman Sachs Global Investment Research

Exhibit 7: The Net Zero, Infrastructure and Clean Water mosaic

Critical technologies/focus areas and annual investment in the 2020s to achieve Net Zero, Infrastructure and Clean Water needs



Source: IEA, McKinsey, OECD, Company data, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

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