

# Electricity and gas (CNAE D)

## BRAZILIAN SUSTAINABLE TAXONOMY

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# Electricity and gas (CNAE D)

## Sector overview

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The electricity and gas sectors are crucial for ensuring Brazil's energy security and fulfilling its climate commitments. These sectors are made up of thousands of companies in their respective segments of electricity generation, transmission, distribution and commercialization, which contribute around 2% of the added value in the Gross Domestic Product (GDP) (IBGE, 2021) and provide more than 130,000 direct jobs in the country (RAIS, 2023). According to the Ministry of Mines and Energy (BRASIL. MME, 2023), the export of surplus electricity from Brazil to neighboring countries, such as Argentina and Uruguay, generated substantial revenue of BRL 1.3 billion in 2022. This not only contributed significantly to national programs but also helped to balance domestic tariffs, highlighting the sector's positive influence and its potential for future growth.

In 2023, renewable sources supplied 49.1% of Brazil's primary energy demand, making its energy mix among the least carbon-intensive worldwide. Due to its matrix, the electricity sector plays a crucial role in this low-carbon-intensity profile, relying heavily on hydroelectric power, which together with other renewable sources such as wind, solar and biomass distributed throughout the national territory, results in the achievement of over 90% renewability in the electricity generated in the country (EPE, 2024) and reduced emission factors. The average emission factor of the National Interconnected System (Sistema Integrado Nacional - SIN) over the last 10 years (2015 to 2024) was 77.15 gCO<sub>2</sub>/kWh<sup>1</sup>, and the Ten-Year Energy Expansion Plan (PDE) 2034 estimates that, at the end of the ten-year horizon, the country's electricity supply will remain predominantly sourced from renewable sources, such as hydropower, biomass, wind and solar, with an estimated renewability level of 86.1%. Thus, it is understood that the Brazilian grid is clean enough to allow the direct procurement of energy from its network, without significant impacts on greenhouse gas (GHG) emissions. This context positions the electricity sector as a driving force behind Brazil's contributions to reducing carbon emissions from energy generation.

The expansion of energy efficiency measures is another important aspect and contributes to increased industrial competitiveness and equitable tariffs for end consumers. In the industrial sector, for example, improvements in energy efficiency in Brazilian industry are projected to result in savings of about 5% of its total energy consumption by 2031 (EPE, 2022). This is equivalent to avoiding the consumption of approximately 7.6 million tonnes of oil equivalent, comparable to the total consumption of petroleum derivatives (including diesel oil, fuel oil, liquefied natural gas (LNG), and kerosene) for thermal use observed in the industry in 2020.

In addition to the electricity system, biogas, and more specifically biomethane, is another important source and has recently gained prominence as an alternative to natural gas, since Brazil only exploits about 3% of its biogas potential. Projections indicate that, by 2030, the potential for production of biogas from sugarcane will be approximately double the average volume of natural gas imported from Bolivia (EPE, 2024b). The proximity to consumption centers and the possibility of rural development as a substitute for diesel oil or derived from biodigesters are aspects that make biogas an innovative advantage for Brazil.

The energy sector in Brazil faces growing challenges in the context of a changing climate. Factors such as changes in precipitation patterns, prolonged droughts and extreme weather events, including storms and heatwaves, create

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<sup>1</sup> Based on CO<sub>2</sub> emission factors from electricity generation in Brazil's National Interconnected System, for corporate inventories calculated by MCTI (2025).

significant vulnerabilities in energy production, distribution and consumption. These conditions highlight the importance of focusing on resilience within the energy system. Elements such as diversification of energy sources, increased energy efficiency and strengthened infrastructure play a key role in the sector's ability to adapt to climate fluctuations and ensure a more stable and sustainable energy supply in the future.

## Prioritization of activities

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**Objective 1 — Climate change mitigation:** The prioritization of economic activities in the Brazilian Sustainable Taxonomy (TSB) Action Plan sectors was carried out through a quantitative and qualitative analysis, taking available data into account. The indicators used for this assessment were drawn from a five-year historical series and included: 1) GDP, employment, and the Economic Complexity Index, which measure the social and economic relevance of activities; 2) GHG emissions and other climate indicators based on scenarios from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), which assess the potential for mitigating climate change; 3) the existence of economic activities in other taxonomies, which favors interoperability; and 4) an expert assessment, which considers climate priorities and sector regulations, reflecting the importance in the Brazilian context. The data was normalized and scored, with different weights according to sectoral importance, in order to prioritize activities according to a standardized system.

**Objective 2 — Climate change adaptation:** The methodology for selecting activities and measures is based on three main steps: identifying environmental and climate impacts by sector, proposing specific activities and investments to address these impacts, and classifying them based on established qualifying criteria. This process is guided by alignment with the goals and priorities of the National Adaptation Plan, supported by scientific evidence that demonstrates its positive contribution to climate adaptation, by the ambition to strengthen the resilience of sectors and activities in the face of climate change impacts and by interoperability with other international and regional taxonomies. The taxonomy includes adapted and enabling activities and measures. The metrics for determining the qualification of adaptation activities or measures in all sectors included the following options: quantitative/verifiable metrics to demonstrate impact, a checklist of qualitative requirements and verifications, a list of directly qualified activities and measures, and vulnerability assessment.

## Public consultation updates and considerations for future editions

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The preliminary proposals for the first edition of the TSB were submitted for public consultation between November 16, 2024, and March 31, 2025, were structured in two disclosure stages. The first stage of the consultation included introductory taxonomy documents, while the second stage provided technical and thematic technical chapters, with technical criteria for mitigation and adaptation, sectoral safeguards and adjustments to economic activities. Civil society was able to contribute freely throughout the process.

This technical chapter incorporates the contributions received and the adjustments made during the public consultation. Below are specific considerations for future updates:

- Adjustments to the technical qualification criteria will be considered in light of new scientific evidence, technological advances, and practical implementation experiences, especially concerning emerging activities such as low-carbon emission hydrogen production, energy storage, and digitalization of the electricity grid.

- The taxonomy may incorporate new evaluation parameters for the do no significant harm (DNSH) criteria, including more robust minimum safeguards, with a focus on biodiversity, land use, and water resources, as well as social aspects related to reducing regional and territorial inequalities.
- A reassessment of mixed activities using fossil fuels in transition is planned, with a review of temporal and percentage limits to ensure greater alignment with climate targets and national and international regulatory frameworks.

# Objective 1 — Climate change mitigation

## Categories of eligible activities

- D1: Hydroelectric power generation
- D2: Wind power generation
- D3: Solar power generation
- D4: Thermal electricity generation from renewable biomass, biogas, biomethane and other fuels
- D5: Electricity generation from tides, waves, and ocean currents
- D6: Electricity generation from nuclear sources
- D7: Electricity transmission
- D8: Electricity distribution
- D9: Grid digitalization, smart grid development, and management of demand, power quality, and energy efficiency
- D10: Energy storage systems
- D11: Low-carbon emission hydrogen production
- D12: Biogas and biomethane production
- D13: Transportation and distribution of gaseous fuels through pipeline systems
- D14: Transportation of CO<sub>2</sub> through piping systems and/or ducts
- D15: CO<sub>2</sub> storage
- D16: Efficient street lighting
- D17: Implementation of solar heating panels and technologies for water heating
- D18: Research, development, and innovation activities for the sector

General Note: For all electricity generation activities (D1 to D6), essential auxiliary systems required to the operation of the plants, such as control systems, temporary energy storage systems, internal substations, inverters, cables, and monitoring systems, are considered eligible, as long as they are directly associated with the operation of the generating plant.

## Sector-specific activities

### *D1: Hydroelectric power generation*

#### **National Classification of Economic Activities (Classificação Nacional de Atividades Econômicas - CNAEs):**

- 35.11-5: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

#### **Description:**

- Implementation, construction, modernization, expansion, repowering, operation, and maintenance of electricity generation facilities that produce energy from hydraulic sources.

#### **Examples of activities:**

- Hydropower plant with reservoir
- Run-of-river power plant
- Small and micro hydropower plants, for self-production, independent production, centralized or distributed production, connected or not to the grid

**Substantial contribution to Objective 1 — Climate change mitigation**

- A. All existing projects are directly qualified and exempt from submitting a product life cycle assessment, including carbon footprint assessment, provided they comply with the current legal environmental licensing and permitting requirements<sup>2</sup>.
- B. Hybrid systems integrating existing hydroelectric power generation with other renewable sources, such as wind power generation (D2) and solar power generation (D3), qualify, provided they meet the technical criteria for each source involved and demonstrate their contribution to climate change mitigation and adaptation.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

**Do no significant harm (to any of the following objectives):**

Climate change adaptation	<ul style="list-style-type: none"> <li>• Conduct studies on the vulnerability of infrastructure to extreme climatic events, such as prolonged droughts or floods.</li> <li>• Whenever possible, design reservoirs that allow volume and capacity adjustments in response to climatic events.</li> <li>• Evaluate studies on changes in the flow regime.</li> <li>• Evaluate and revise operational hydraulic restrictions in view of the "new" dynamics of reservoir operation.</li> <li>• Conduct studies on increasing resilience to extreme climate events.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Build fish ladders and flow detours to ensure the migration of aquatic species, if indicated by the environmental agency under the Environmental Licensing process scope.</li> <li>• Conduct periodic biodiversity assessments in adjacent areas to identify and mitigate impacts.</li> <li>• Manage the removal of flora and fauna in the event of reservoir construction.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Conduct forest compensation measures defined in the environmental licensing, integrating soil use planning with conservation strategies in the zones of influence.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• In accordance with local regulations, all technically feasible and ecologically relevant mitigation measures must be implemented to reduce adverse impacts on water, as well as on protected habitats and species directly dependent on water. The measures include, where relevant and depending on the ecosystems present in the affected water bodies:</li> </ul>

<sup>2</sup> The environmental licensing of hydropower projects in Brazil, established under CONAMA RESOLUTION No. 237 of December 19, 1997, occurs in three phases when required according to this regulation. This process requires the submission of Environmental Impact Statement (EIS) and their respective Environmental Impact Report (EIR), as well as the establishment of mitigation and compensation measures for environmental impacts. The first phase involves obtaining the Preliminary License (LP), in which the environmental viability of the project is assessed. The second phase is obtaining the Installation License (LI), which authorizes the start of construction and requires the implementation of mitigation measures. Finally, the third phase is the Operating License (LO), which allows the generation of energy after the completion of construction and verification of compliance with the established regulations. As such, it is understood that this process ensures that environmental impacts and associated emissions are managed through measures such as vegetation suppression in the alleged area, preventing its decomposition and the consequent emission of methane, as well as the recovery of permanent preservation areas and environmental compensation that may include forest restoration.

**Do no significant harm (to any of the following objectives):**

	<ul style="list-style-type: none"> <li>○ Measures to ensure fish migration upstream and downstream (such as fish-friendly turbines, fish guidance structures, fully functional fish passages, and measures to interrupt or minimize operations and discharges during migration or spawning periods);</li> <li>○ Measures to ensure minimum ecological flow (including mitigation of rapid and short-term variations in flow or hydro-peak operations) and sediment flow;</li> <li>○ Measures to protect or improve habitats. The effectiveness of these measures is monitored in the context of the authorization or permit that establishes the conditions aimed at achieving good status or potential of the affected water body.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>● Prioritize recycling, composting, reuse, and other sustainable treatments in solid waste management throughout the project's life cycle, including prioritization of recyclable materials for infrastructure construction, if technically feasible.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>● Develop a water quality monitoring plan.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>● Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

**D2: Wind power generation****CNAEs:**

- 35.11-5: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description:**

Implementation, construction, modernization, expansion, repowering, operation, and maintenance of electricity generation facilities that produce energy from wind sources.

**Examples of activities:**

- Wind farms onshore and offshore, for self-production, independent production, centralized or distributed generation, connected or not to the grid

**Substantial contribution to Objective 1 — Climate change mitigation**

The activity is directly qualified as a substantial contribution to climate change mitigation and is exempt from submitting a product life cycle assessment, including the carbon footprint.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

**Do no significant harm (to any of the following objectives):**

Climate change adaptation	<ul style="list-style-type: none"> <li>• Use turbines with robust anchoring systems to withstand extreme winds.</li> <li>• Install machine operational safety systems to quickly adapt operations to local climate change.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct studies to identify and mitigate risks to migratory birds and endangered species.</li> <li>• Create areas around the turbines where human activities are restricted to protect the local fauna, if indicated by the environmental licensing process.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Prioritize installation on human-modified land, minimizing the occupation of natural areas, creating plans for land restoration and multiple uses. For each turbine installed, contribute to habitat conservation projects.</li> </ul>
Sustainable use and protection of water and marine resources	<p>In the case of deployment offshore:</p> <ul style="list-style-type: none"> <li>• Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> <li>• Adopt technologies to reduce the noise generated by operations, protecting marine fauna.</li> </ul>
Transition to circular economy	<ul style="list-style-type: none"> <li>• Establish partnerships to recycle or reuse parts of wind turbines at the end of their life cycle and to use recycled materials in construction (e.g., cement made from slag).</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Design turbines to minimize the impact of noise and intermittent shading on neighboring communities; regularly measure noise levels and shadowing effects.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

**D3: Solar power generation****CNAEs:**

- 35.11-5: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description:**

Implementation, construction, modernization, expansion, repowering, operation and maintenance of electricity generation facilities that produce energy from solar sources using concentrated solar power (CSP) or photovoltaic (PV) technology.

**Examples of activities:**

- Concentrated solar power plants, photovoltaic plants, for self-production, independent production, centralized or distributed generation, whether connected to the grid or not.

**Substantial contribution to Objective 1 — Climate change mitigation**

The activity is directly qualified as a substantial contribution to climate change mitigation and is exempt from submitting a product life cycle assessment, including the carbon footprint.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

Do no significant harm (to any of the following objectives):	
Climate change adaptation	<ul style="list-style-type: none"> <li>• Design structures to withstand storms, high winds, and other extreme weather events.</li> <li>• Use sensors to monitor the solar system's performance during periods of intense heat or other extreme weather conditions.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct environmental and forest compensation measures defined in the environmental licensing, integrating the soil use planning with conservation strategies in the zones of influence.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Prioritize the use of non-productive land for the installation of solar panels and ensure that the deployment areas have not been converted from natural vegetation. Implement floating solar panels in reservoirs to maximize efficiency and reduce land occupation, especially in hydroelectric plants, whenever possible.</li> <li>• Use the most efficient technologies in the category, improving the ratio of energy generated per occupied area.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Prioritize water-saving cleaning methods, such as dry-cleaning systems or reusing rainwater.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Establish a system or seek partnerships for collecting and recycling solar panels at the end of their life cycle.</li> <li>• Promote the use of low environmental impact materials in the manufacturing of solar modules.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

#### ***D4: Electricity generation from thermal sources using renewable biomass, biogas, biomethane and other fuels***

**CNAEs:**

- 35.11-5/01: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description:**

Implementation, construction, modernization, expansion, repowering, operation and maintenance of facilities that generate electricity from renewable biomass, biogas, biomethane or other renewable fuels, including electricity generation from the mixture of biogas/biomethane with natural gas.

**Examples of activities:**

- Power plants fueled by biomass, biogas and bioenergy in general, as well as cogeneration plants for self-production, independent production, centralized or distributed generation, whether connected to the grid or not.

**Out-of-scope activities:**

- Electricity generation from natural gas with use limits higher than those defined in the table in item C (Substantial contribution to Objective 1 — Climate change mitigation) or from other fossil fuels.
- Use of sewage sludge to generate electricity in processes that do not involve inadequate disposal.

**Substantial contribution to Objective 1 — Climate change mitigation**

The sector's activities must demonstrate alignment with criteria A, B, C, D or E:

- A. All enterprises that use biomass or biomass derivatives exclusively (such as sugarcane bagasse, black liquor, among others) must provide proof of the origin of the biological raw material, following the same criteria established in the CNAE C — Manufacturing Industry, biomass and biofuel production activity technical chapter.
- B. All enterprises using only biogas or biomethane must provide evidence and certification in accordance with the criteria established for Activity D12: Production of biogas and biomethane, or criteria established in CNAE E — Water, sewage, waste management and decontamination activities technical chapter, in the activity of Anaerobic digestion of sludge and sewage.
- C. Enterprises using a mix of biogas/biomethane and natural gas must provide proof of certifications and the origin of the biological raw material, following the same criteria established for Biomass and biofuel production activity in the CNAE C — Manufacturing Industry chapter and for the Biogas and biomethane production activity, and must comply with a maximum limit for the use of natural gas in the mixture, as shown in the table below:

NG Percentage	Period
50.0%	2025–2029
37.5%	2030–2034
25.0%	2035–2039
12.5%	2040–2044
0%	2044 onwards

- D.** Electricity generation from municipal solid waste (MSW) only qualifies if there is thermal recovery of waste heat and prior waste handling and sorting steps, ensuring energy efficiency and minimizing environmental impacts.
- E.** Until December 31, 2035, enterprises using natural gas with carbon capture systems will be eligible, provided they meet the following criterion:
- i. Carbon dioxide emissions associated with the enterprise's life cycle must remain below 70 gCO<sub>2</sub>/kWh<sup>3</sup>. For existing enterprises, this proof must be based on operational data; for new enterprises, the project must forecast emissions below this limit, include an adaptation plan for the use of renewable fuels, and, once in operation, comply with the same criteria applicable to existing ones.
  - ii. For carbon capture, the criteria defined in the Cross-cutting appendix: Carbon Capture and Utilization (CCU and BECCU) must be met.

#### Do no significant harm

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

#### Do no significant harm (to any of the following objectives):

Climate change adaptation	<ul style="list-style-type: none"> <li>Whenever possible, diversify biomass sources to mitigate risks related to extreme weather events, such as droughts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>Ensure that biomass is sourced from suppliers that use sustainable agricultural practices, such as crop rotation and soil conservation.</li> <li>Implement protection areas around biomass sources to preserve local biodiversity.</li> </ul>

<sup>3</sup> Value established based on emissions from the Brazilian electricity sector as presented in the introduction to this technical chapter.

**Do no significant harm (to any of the following objectives):**

Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Prioritize cogeneration, using raw materials from secondary production such as agricultural and forestry waste, as long as their use does not compromise ecological functions or other sustainable uses, such as soil protection between crops.</li> <li>• Adopt technologies with high conversion efficiency.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• A water resources management plan should be drawn up, specifying when the freshwater aquifers will be used and whether they are currently used for human consumption.</li> <li>• The assessment of local water availability must demonstrate that the water used in biomass production does not impact the availability for human consumption and agriculture.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Use agricultural and forestry residues as inputs for bioenergy generation. Reuse by-products from the conversion process in other applications, such as biofertilizers.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Install filtration systems to minimize pollutant emissions during biomass combustion.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

**D5: Electricity generation from tides, waves, and ocean currents****CNAEs:**

- 35.11-5: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description:**

Implementation, construction, modernization, expansion, operation and maintenance of electricity generation facilities that produce energy from tides, waves and ocean currents.

**Examples of activities:**

- Wave and tidal power plants connected or not to the grid.

**Substantial contribution to Objective 1 — Climate change mitigation**

- A. These are directly qualified and are exempt from submitting a product life cycle assessment, including a carbon footprint assessment.
- B. Hybrid systems integrating ocean energy with other renewable sources, wind power generation (D2), solar power generation (D3) and hydrogen production (D11) qualify, provided that they meet the technical criteria for each source involved and contribute to climate change mitigation and adaptation.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change adaptation	<ul style="list-style-type: none"> <li>Design infrastructures that can withstand extreme weather conditions, such as storms and rising sea levels. Assess climate risks and implement measures to mitigate adverse impacts on operations.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>Do not damage coral reefs and fish spawning areas.</li> <li>Implement initiatives to restore damaged marine ecosystems.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>Monitor and control water quality in the vicinity of facilities to prevent pollution. Ensure that facilities do not significantly alter natural water flow patterns.</li> <li>Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Use waste generated during construction for other purposes.</li> <li>Prioritize the use of recyclable materials in equipment.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Establish a monitoring system to detect and control pollutants in the surrounding waters.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

## ***D6: Electricity generation from nuclear sources***

### **CNAEs:**

- 35.11-5: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

### **Description:**

Implementation, construction, modernization, expansion, repowering, operation and maintenance of electricity generation facilities that produce energy from nuclear sources.

### **Examples of activities:**

- Generation II reactors and beyond;
- Fixed, mobile, and floating reactors; and
- Reactors for self-production, independent production, and centralized production.

**Out-of-scope activities:**

- Generation I reactors.

**Substantial contribution to Objective 1 — Climate change mitigation**

A. All nuclear energy generation enterprises are directly qualified and are exempt from submitting a product life cycle assessment, including a carbon footprint assessment, under the following conditions:

- Enterprises that present detailed plans for the management of radioactive waste and spent nuclear fuel, as well as those that show the existence of adequate financial mechanisms for the decommissioning of nuclear power plants, including funds created to ensure the conduction of all these stages of radioactive waste and spent nuclear fuel management, will be considered sustainable until a final national repository is provided.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

**Do no significant harm (to any of the following objectives):**

Climate change adaptation	<ul style="list-style-type: none"> <li>• Design infrastructures that can withstand extreme weather conditions.</li> <li>• Assess climate risks and implement measures to mitigate adverse impacts on operations.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Implement a fund for the decommissioning of radioactive waste and spent nuclear fuel to finance all stages of waste management, including spent nuclear fuel.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• The assessment of local water availability must demonstrate that the water used for nuclear power generation does not impact availability for human consumption, animal watering and agriculture.</li> <li>• Conduct background studies of surface and groundwater resources to characterize their initial state, prior to the installation of the facility.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Integrate nuclear energy production with other low-carbon sustainable projects.</li> </ul>

Pollution prevention and control	<ul style="list-style-type: none"> <li>• The management of radioactive waste must not impact on other environmental objectives for the preservation and protection of the environment, such as the protection of water resources and ecosystems.</li> <li>• The construction, operation, and decommissioning of enterprises must comply with all legal and regulatory requirements, especially for the protection and safe management of radioactive waste.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

## ***D7: Electricity transmission***

### **CNAEs:**

- 35.12-3: Electricity transmission
- 42.21-9/02: Construction of power distribution stations and networks

### **Description:**

This includes the construction, operation, expansion, repowering, reinforcement, modernization, and maintenance of the electricity transmission infrastructure, including the Basic Network of the National Interconnected System (SIN) and the Other Transmission Facilities (DIT).

The SIN's Basic Network includes transmission lines, busbars, power transformers, and substation equipment with a voltage equal to or greater than 230 kV, as well as transformers with a primary voltage equal to or greater than 230 kV and secondary or tertiary voltages below 230 kV, their connections and other associated equipment.

DITs include:

- Transmission lines, busbars, power transformers, and substation equipment at any voltage, when used exclusively or shared by generation plants or free consumers;
- Facilities and equipment, at any voltage, intended exclusively for the import and/or export of electricity, when not classified as international interconnections;
- Transmission lines and equipment at voltages below 230 kV, whether or not they are in substations that are part of the Basic Grid.
- Offshore facilities.

### **Examples of activities:**

- Construction, operation and maintenance of electricity transmission systems responsible for transporting electricity from generating units to distribution systems.

### **Out-of-scope activities:**

- Restricted Interest Transmission Systems for connecting power plants that use energy generation sources and technologies not covered in this document.

### **Substantial contribution to Objective 1 — Climate change mitigation**

The activity directly qualifies as a substantial contribution to climate change mitigation.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change adaptation	<ul style="list-style-type: none"> <li>• Build towers, transmission lines and substations that can withstand extreme weather events.</li> <li>• Develop plans to maintain operations during severe weather events.</li> <li>• Ensure system redundancy.</li> <li>• Conduct studies on increasing resilience to extreme climate events.</li> <li>• Develop studies on increasing the resilience of the distribution and transmission system to extreme weather events.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct studies to identify sensitive areas during the construction of transmission lines and substations.</li> <li>• Implement measures to protect habitats and endangered species in passage areas, as required by the Environmental Licensing process.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Plan transmission routes that minimize fragmentation of natural habitats. Contribute to conservation projects in areas affected by construction.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• In the case of deployment offshore: <ul style="list-style-type: none"> <li>○ Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> <li>○ Adopt technologies to reduce the noise generated by operations, protecting marine fauna.</li> </ul> </li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Promote the recycling of materials used in transmission lines and substations at the end of their life cycle. Prioritize the use of low environmental impact materials.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Monitor and control noise levels generated by transmission equipment.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

## D8: Electricity distribution

### CNAEs:

- 35.14-0: Electricity distribution
- 42.21-9/02: Construction of power distribution stations and networks

### Description:

Includes the operation, construction, expansion, repowering, reinforcement, modernization, and maintenance of the network responsible for transporting electricity from substations to the end consumers. It is classified into three voltage levels: Low Voltage (LV) covers phase-to-phase voltages with an effective value below 2,3 kV, serving residential, commercial, industrial, and rural consumers with installed power equal to or less than 75 kW, as well as public lighting; Medium Voltage (MV) applies to phase-to-phase voltages with an effective value equal to or greater than 2,3 kV but below 69 kV, serving loads greater than 75 kW with the maximum contracted demand equal to or less than 2.500 kW; and High Voltage (HV) covers voltages equal to or greater than 69 kV, extending up to 230 kV, serving large consumers with the maximum contracted demand exceeding 2.500 kW.

### Examples of activities:

- Construction, maintenance, and operation of electricity distribution systems that transport electricity received from generation or transmission systems to the end consumer.
- Maintenance of electrical networks and measurement of electricity consumption.
- Micro-grids: small-scale electrical system with loads and Distributed Energy Resources capable of operating isolated or connected to the distribution network.

### Out-of-scope activities:

- Facilities of restricted interest for the connection of power plants using energy generation sources and technologies not covered in this document.

### Substantial contribution to Objective 1 — Climate change mitigation

The activity directly qualifies as a substantial contribution to climate change mitigation.

### Do no significant harm

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

### Do no significant harm (to any of the following objectives):

Climate change adaptation	<ul style="list-style-type: none"> <li>• Design distribution networks that can withstand extreme weather conditions and temperature changes.</li> <li>• Conduct regular analyses to identify and mitigate risks associated with extreme weather events, including investments in improving the climate monitoring infrastructure and creating predictive models that anticipate the need for interventions in the network.</li> <li>• Incorporate smart technologies, such as real-time sensors and automated response systems (<i>self-healing</i>), to monitor network performance in adverse conditions and that have the ability to automatically detect, isolate and recover from failures.</li> <li>• Conduct studies on increasing resilience to extreme climate events</li> </ul>
Protection and restoration of	<ul style="list-style-type: none"> <li>• Conduct studies to identify sensitive areas during the construction of distribution systems.</li> <li>• Implement measures to protect habitats and endangered species in passage areas.</li> </ul>

Do no significant harm (to any of the following objectives):	
biodiversity and ecosystems	
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>Align distribution projects with sustainable land use plans, including conservation, management and responsible use of forests.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Encourage the reuse and recycling of materials during the installation and maintenance of networks.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### ***D9: Grid digitalization, smart grid development, and management of demand, power quality, and energy efficiency***

#### **CNAEs:**

- 35.14-0: Electricity distribution
- 33.21-0: Installation of industrial machinery and equipment
- 43.21-5: Electrical, hydraulic and other installations in construction
- 62.00-0: Information technology services activities

#### **Description:**

This activity encompasses the implementation of projects, technologies and measures at various stages of the electricity system chain to support demand management and response, the digitalization of the electricity system, the creation of smart grids, and guarantee the quality of energy and efficiency in the generation, transmission, distribution, and use of energy, with a focus on updating and improving the traditional electricity grid to improve its efficiency, reliability, flexibility, and capacity to integrate renewable energy sources and reduce losses.

Concerning demand response, these mechanisms enable the end consumers to reduce, shift, or increase their electricity consumption over time in response to changes in the price of energy or other financial incentives.

#### **Examples of activities:**

Key elements to support grid modernization, smart grid development, power quality, energy efficiency and demand management include:

- Automation of networks and substations.

- Project development and implementation of demand response technologies and systems.
- Implementation of digital tools that facilitate the connection and management of renewable energies on the grid.
- Integration of electric vehicles (EVs) and implementation of platforms to manage the charging and discharging of electric vehicles on the grid.
- Implementation of cybersecurity technologies and projects.
- Implementation of digital twins projects and other digital technologies that favor efficiency and flexibility in the operation of the grid and generation plants.
- Other digitalization processes, such as the implementation of advanced sensors, smart meters, and communication systems to collect and transmit data in real time, improving grid visibility and control.
- Energy efficiency auditing or diagnosis, as well as measurement and inspection services for projects.
- Programs to reduce losses in electricity distribution and transmission, with a focus on replacing inoperative equipment, modernizing the electricity grid, and campaigns to combat fraud. These actions contribute to the efficiency of the electricity sector, energy justice and the reduction of GHG emissions.
- Mechanisms, projects, and programs to increase energy efficiency in generation from sources included in the TSB, transmission and distribution of energy.

**Out-of-scope activities:**

- Demand response actions that use fossil fuel-based electricity generation alternatives to modulate consumption reduction.

**Substantial contribution to Objective 1 — Climate change mitigation**

The activity directly qualifies as a substantial contribution to climate change mitigation.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change adaptation	<ul style="list-style-type: none"> <li>• Develop demand management systems that automatically adjust energy consumption in response to weather variations.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Integrate environmental monitoring solutions into smart grids to protect local biodiversity.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Use existing urban spaces and structures to deploy smart grids, thereby avoiding the degradation of new areas.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Implement water management practices that integrate the monitoring of energy and water consumption.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Transition to a circular economy	<ul style="list-style-type: none"> <li>• Reuse equipment and technologies from traditional grids in the implementation of smart grids, promoting resource efficiency.</li> <li>• Establish partnerships with technology companies that prioritize sustainable and recyclable solutions</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Install pollution level monitoring systems</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> <li>• Establish programs to promote energy justice and inclusion, prioritizing the regularization of energy supply in vulnerable communities, voluntary discounts on energy tariffs, and awareness programs on energy efficiency. These activities promote equity in the electricity sector and tackle inequalities.</li> </ul>

**D10: Energy storage systems****CNAEs:**

- 33.21-0: Installation of industrial machinery and equipment
- 35.14-0: Electricity distribution
- 35.11-5: Electricity generation
- 42.21-9/02: Construction of power distribution stations and networks
- 42.21-9/03: Maintenance of electricity distribution networks

**Description:**

Construction, expansion, repowering and/or operation of facilities that store energy at a given time and return it to the grid or to the consumer at a later time in the form of electricity.

**Examples of activities:**

- Reversible power plants, batteries, flywheels, thermal storage.

**Substantial contribution to Objective 1 — Climate change mitigation**

The activity directly qualifies as a substantial contribution to climate change mitigation.<sup>4</sup>

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<sup>4</sup> Given environmental concerns, in the case of battery storage, recycling and waste containment plans must be addressed in the environmental licensing process, in accordance with applicable regulations. Likewise, reversible power plants will be subject to the appropriate environmental licensing. These requirements will be dealt with by the competent regulatory body once specific legislation has been approved.

### Do no significant harm (to any of the following objectives):

Climate change adaptation	<ul style="list-style-type: none"> <li>• Conduct simulations of future climate scenarios (e.g., temperature rises, extreme events) to understand how these factors impact the performance of storage technologies.</li> <li>• Implement active cooling systems to keep the operating temperature of the batteries within safe limits, especially in regions with high temperatures.</li> <li>• In the case of reversible power plants:             <ul style="list-style-type: none"> <li>○ Conduct studies on the vulnerability of infrastructure to extreme climatic events, such as prolonged droughts or floods.</li> <li>○ Design reservoirs that allow volume and capacity adjustments in response to climatic events, according to the limits established in the Environmental Licensing process.</li> </ul> </li> </ul> <p>Opt for construction materials and components that are highly resistant to extreme temperatures and humidity. For example, use treated plastics and metals that do not deteriorate easily in harsh conditions.</p>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• For sites/operations located in or near protected areas — such as UNESCO World Heritage Sites and Key Biodiversity Areas, as well as other protected areas — an appropriate assessment, where applicable, should be conducted, and the necessary mitigation measures should be implemented based on its conclusions.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Ensure that the installation of storage systems does not compromise areas of high biodiversity, prioritizing sites that do not affect critical habitats.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• In the case of hydroelectric storage by reversible power plants, the activity must meet the following criteria:             <ul style="list-style-type: none"> <li>○ Measures to ensure fish migration upstream and downstream (such as fish-friendly turbines, fish guidance structures, fully functional fish passages, and measures to interrupt or minimize operations and discharges during migration or spawning periods);</li> <li>○ Measures to ensure minimum ecological flow (including mitigation of rapid and short-term variations in flow or hydro-peak operations) and sediment flow.</li> </ul> </li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• A waste management plan must be established, ensuring reuse or recycling at the end-of-life cycle, in accordance with the waste hierarchy; it is recommended to include a detailed overview of waste management partners or reverse logistics projects, reflected in financial projections or official project documentation.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Implement recycling programs for used batteries, ensuring that toxic components are treated safely.</li> <li>• Promote the reuse of materials whenever possible.</li> <li>• Design and implement containment systems to prevent leaks of hazardous substances, such as battery acid, during storage and transportation.</li> <li>• Establish emergency detection and response plans that specifically address leaks or contamination, including clean-up protocols and communication with the relevant authorities.</li> </ul>

Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>
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## ***D11: Low-carbon emission hydrogen production***

### **CNAEs:**

- 20.14-2: Manufacture of industrial gases

### **Description:**

Production of low-carbon hydrogen as established in the National Low-Carbon Hydrogen Policy and respective regulations.

### **Examples of activities:**

- Water electrolysis using renewable energy to generate hydrogen
- Water electrolysis using grid electricity to generate hydrogen
- Biomass gasification for hydrogen production

### **Substantial contribution to Objective 1 — Climate change mitigation**

The sector's activities must be aligned with at least one of the following criteria:

- The production of hydrogen from electrolysis of water or aqueous solutions using electricity from renewable sources is directly qualified.
- The production of hydrogen from catalytic reforming, gasification, or biodigestion of biomass and biofuels is directly qualified and must provide proof of the origin of the biological raw material, following the same criteria established for the activity Production of biomass and biofuels in the CNAE C — Manufacturing Industry technical chapter.
- In addition to the cases mentioned in items A and B, low-carbon emission hydrogen routes are those that comply with the regulations of the National Low-Carbon Hydrogen Policy, with threshold revisions established through 31/Dec/2030.

### **Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change adaptation	<ul style="list-style-type: none"> <li>Design facilities that can withstand adverse weather conditions, such as flooding or high temperatures.</li> <li>Conduct impact studies to understand how changes in the availability of renewable energy may affect hydrogen production.</li> </ul>
Protection and restoration of	<ul style="list-style-type: none"> <li>Choose facility locations that avoid ecologically sensitive areas.</li> </ul>

Do no significant harm (to any of the following objectives):	
biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Implement restoration measures for areas impacted by the construction of hydrogen infrastructures.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• For hydrogen produced from biomass, the applicant must establish monitoring programs to assess the impacts of biomass production on local biodiversity and ecosystem services.</li> <li>• Implement management practices that guarantee the preservation of ecosystems and the recovery of degraded areas by using biomass as a renewable resource.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• A water resources management plan should be drawn up, specifying when the freshwater aquifers will be used and whether they are currently used for human consumption.</li> <li>• The assessment of local water availability must demonstrate that the water used for hydrogen production does not impact availability for human consumption and agriculture.</li> <li>• Hydrogen production assets with high water demand, such as the electrolyte route, located in regions with high water stress, should anticipate alternatives to be used, such as seawater desalination or other solutions.</li> <li>• For hydrogen production using desalination plants, a brine management plan must be developed and approved through the EIA process, addressing potential environmental risks and mitigation measures associated with brine disposal.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• The low-carbon emission hydrogen plant must follow the waste disposal plan established by law and the local environmental agency.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• The low-carbon emission hydrogen plant must follow the waste disposal plan established by law and the local environmental agency.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

## ***D12: Biogas and biomethane production***

### **CNAEs:**

- 35.20-4: Gas production; natural gas processing; distribution of gaseous fuels through urban networks
- 42.92-8: Assembly of industrial facilities and metal structures

### **Description:**

Production of gaseous fuels from the biological decomposition and/or codigestion of organic matter (municipal solid waste, sewage and sludge, animal waste, agroforestry residues, vinasse and sugarcane filter cake) and from biomass gasification processes, covering both the production of biogas and, when applicable, its refining to obtain biomethane.

The activity includes the construction, operation, modernization, expansion and maintenance of facilities producing these fuels.

**Examples of activities:**

- Biogas and biomethane production
- Implementation of anaerobic digestion tanks to convert organic waste into biogas
- Biogas plant operation
- Installation of purification systems to remove impurities from biogas

**Substantial contribution to Objective 1 — Climate change mitigation**

The sector's activities must be aligned with at least one of the following criteria:

- A. The production of biogas derived from biomass, such as the gasification of agricultural waste, must provide proof of the origin of the biological raw material, following the same criteria established for the Production of biomass and biofuels activity in the CNAE C — Manufacturing Industry technical chapter.
- B. The production of biogas and/or biomethane must be linked to traceability mechanisms and proof of sustainable origin, such as certification through the Certificate of Gas of Biological Origin (CJOB) or another equivalent instrument that attests to the renewable origin of the gas, in accordance with current technical and regulatory criteria.
- C. The production of biogas and/or biomethane through anaerobic digestion of sludge, sewage, and organic waste must follow the same criteria established for the anaerobic digestion of sludge and sewage and anaerobic digestion of organic waste activities in the CNAE E — Water, sewage, waste management, and decontamination activities technical chapter.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

Do no significant harm (to any of the following objectives):	
Climate change adaptation	<ul style="list-style-type: none"> <li>• Implement sustainable management practices at decomposition sites to increase the resilience of production systems to climate change.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Integrate protection zones around the facilities, ensuring the preservation of natural habitats.</li> <li>• Use organic waste to promote local biodiversity, such as composting and utilization in agricultural areas.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Apply crop rotation and agroecological practices in areas that provide raw material for biogas, avoiding soil degradation.</li> <li>• Plan land use to minimize competition with food crops, prioritizing residues and by-products.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Properly treat the effluents generated in biogas production to avoid contaminating water bodies. Implement water collection and reuse systems in facilities, reducing water demand.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Transition to a circular economy	<ul style="list-style-type: none"> <li>Establish partnerships with agro-industrial sectors for the collection of organic waste, promoting the integration of material flows.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Install filtering and monitoring systems to control atmospheric emissions from the anaerobic digestion process.</li> <li>Establish a plan and implement leak control measures.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

***D13: Transportation and distribution of gaseous fuels through pipeline systems*****CNAEs:**

- 35.20-4/02 Distribution of gaseous fuels through urban networks
- 49.40-0: Pipeline transportation
- 42.23-5: Construction of pipeline transportation networks, except for water and sewage

**Description:**

Implementation, construction, expansion, operation and modernization of transport and distribution networks for gaseous fuels through pipeline systems and produced from different sources and technologies, including all components and complements, such as pressure relief, reduction, or control systems; metering stations; odorization systems; delivery points; interconnection stations; intermediate pumping, compression, or reheating stations.

**Examples of activities:**

- Transportation and distribution of gaseous fuels by pipelines.
- Distribution of gaseous fuels to end users through urban networks.
- Installation of assets that increase flexibility and improve the management of an existing network.
- Gas meters maintenance.

**Out-of-scope activities:**

- Facilities and activities for the exclusive use of transportation and distribution of gaseous fossil fuels
- Facilities and activities for transportation of liquids, grains, and minerals
- Distribution of liquefied natural gas (LNG) or compressed natural gas (CNG) by trucks

**Substantial contribution to Objective 1 — Climate change mitigation**

The sector's activities must demonstrate alignment with A (mandatory) and at least one of the B, C or D criteria:

- A. Appropriate leak detection systems must be applied, and a monitoring plan must be implemented or already in place, with reporting verified by an independent third party.
- B. Facilities and activities for the exclusive use of low-carbon hydrogen transportation and distribution (according to activity D11) and gaseous fuels derived from biological material (according to activity D12) are directly qualified, as well as facilities and activities that directly enable the connection of biomethane projects to the integrated gas pipeline network.
- C. Facilities and activities that directly enable the connection of biomethane projects to the integrated gas pipeline network, even if they are not exclusively for biomethane, are directly qualified.
- D. For transport and distribution networks, facilities and activities are included provided that the overall network is on a decarbonization pathway.<sup>5</sup>

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change adaptation	<ul style="list-style-type: none"> <li>• Implement climate monitoring systems to assess the impact of weather conditions on biogas and biomethane transportation and distribution operations.</li> <li>• Develop contingency plans to respond to extreme weather events that may affect transport infrastructure.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Plan pipeline routes that avoid sensitive areas, thereby minimizing impacts on natural habitats and biodiversity.</li> <li>• Conduct environmental impact assessments to ensure that the construction and operation of transport networks do not harm local ecosystems.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Use existing corridors for the installation of pipelines and ducts, avoiding the degradation of new areas.</li> <li>• Implement erosion and soil degradation control measures during construction to preserve the integrity of forest habitats.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Conduct impact studies to ensure that the construction and operation of pipelines and ducts do not contaminate local water sources.</li> <li>• Implement leak containment systems to prevent contamination of water resources.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Establish partnerships with agro-industrial sectors for the collection of organic waste, promoting the integration of material flows.</li> </ul>

<sup>5</sup> The transport and distribution networks for gaseous fuels are considered to be on a decarbonization path when there is growth in the share of biomethane, within a 5-year moving window, in at least one of the two networks — transport or distribution. This growth is in line with Law No. 14.993/2024, which establishes annual targets for the insertion of biomethane into the natural gas market, defined by the National Energy Policy Council (CNPE). In addition to the mandatory greenhouse gas emissions reduction target, the legislation allows natural gas producers and importers to voluntarily exceed the established minimum, without preventing biomethane producers from selling it directly to end consumers.

Do no significant harm (to any of the following objectives):	
Pollution prevention and control	<ul style="list-style-type: none"> <li>Establish a plan and implement leak control measures.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### ***D14: Transportation of CO<sub>2</sub> through piping systems and/or ducts***

#### **CNAEs:**

- 49.40-0: Pipeline transportation
- 42.23-5: Construction of pipeline transportation networks, except for water and sewage

#### **Description:**

Implementation, construction, expansion, operation, and modernization of transport networks for CO<sub>2</sub> produced from different sources and technologies, including all components and complements, such as pressure relief, reduction or control systems; measuring stations; odorization systems; delivery points; interconnection stations; intermediate pumping, compression or reheating stations.

#### **Examples of activities:**

- Transportation of CO<sub>2</sub> through gas pipelines for storage.
- Installation of infrastructure that optimizes the flow and management of CO<sub>2</sub> in existing networks, which increases transport efficiency and safety.
- Maintenance of CO<sub>2</sub> meters.

#### **Substantial contribution to Objective 1 — Climate change mitigation**

D13 activities will be qualified if they meet all the criteria below:

- CO<sub>2</sub> is delivered to a permanent CO<sub>2</sub> storage site that meets the criteria for underground geological storage of CO<sub>2</sub>.
- Appropriate leak detection systems are applied, and a monitoring plan is implemented or is already in place, with reporting verified by an independent third party.
- Transportation must comply with the technical requirements established in ABNT NBR ISO 27913:2024.

#### **Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

Do no significant harm (to any of the following objectives):	
Climate change adaptation	<ul style="list-style-type: none"> <li>Implement climate monitoring systems to assess the impact of weather conditions on CO<sub>2</sub> transportation operations.</li> <li>Develop contingency plans to respond to extreme weather events that may affect transport infrastructure.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>For sites/operations located in or near protected areas — such as UNESCO World Heritage Sites and Key Biodiversity Areas, as well as other protected areas — an appropriate assessment, where applicable, should be conducted, and the necessary mitigation measures should be implemented based on its conclusions.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>Plan pipeline routes that minimize the fragmentation of natural habitats.</li> <li>Contribute to conservation projects in areas affected by construction.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>In the case of deployment offshore: <ul style="list-style-type: none"> <li>Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> <li>Adopt technologies to reduce the noise generated by operations, protecting marine fauna.</li> </ul> </li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Promote the recycling of materials used in transport networks at the end of their life cycle. Prioritize the use of low environmental impact materials.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Establish a plan and implement leak control measures.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

**D15: CO<sub>2</sub> storage****CNAEs:**

- N/A

**Description:**

Permanent storage of CO<sub>2</sub> in appropriate underground geological formations.

**Examples of activities:**

- Characterization and evaluation of the potential storage complex and surrounding area, or exploration to establish whether the geological formation is suitable for use as a CO<sub>2</sub> storage site.
- Deployment of CO<sub>2</sub> injection and monitoring systems in rock structures
- Acquisition of equipment for the deployment of CO<sub>2</sub> injection and monitoring systems in rock structures

**Substantial contribution to Objective 1 — Climate change mitigation**

- A. For the operation of CO<sub>2</sub> underground geological storage sites, including closure and post-closure obligations, are mandatory:
  - i. Appropriate leak detection systems;
  - ii. Plan for monitoring the injection facilities, the storage complex and, where appropriate, the surrounding environment, with regular reports verified by the competent national authority;

- iii. A monitoring plan that meets the requirements established by the ANP, covering the injection and post-injection periods, including measures for checking, tracking and responding to any leaks or anomalies.
- B. For the exploitation and operation of storage sites, the activity must comply with ABNT NBR ISO 27914: 2024 for geological storage of CO<sub>2</sub>.

### Do no significant harm

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

#### Do no significant harm (to any of the following objectives):

Climate change adaptation	<ul style="list-style-type: none"> <li>Implement feasibility studies to identify suitable sites for CO<sub>2</sub> storage, considering climate change and its geological implications.</li> <li>Develop forecasting models to monitor the behavior of stored CO<sub>2</sub> in different climate scenarios.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>For sites/operations located in or near protected areas — such as UNESCO World Heritage Sites and Key Biodiversity Areas, as well as other protected areas — an appropriate assessment, where applicable, should be conducted, and the necessary mitigation measures should be implemented based on its conclusions.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>Select storage sites that do not compromise the sustainable use of the land, avoiding agricultural areas or areas of great ecological value.</li> <li>Promote reforestation in areas impacted by the activity, contributing to forest conservation.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>Conduct risk studies to ensure that the storage of CO<sub>2</sub> does not contaminate aquifers or water sources.</li> <li>Implement water quality monitoring systems in the vicinity to detect possible contamination.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Reuse materials and technologies from previous storage projects to optimize costs and resources.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Install continuous monitoring systems to detect leaks and guarantee storage integrity.</li> <li>Develop emergency response plans to deal with possible failures in the storage system.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Reduction of socio-economic inequalities, including racial and gender disparities

- Annex A1: Do no significant harm criteria for economic-social Objective 9.

**D16: Efficient street lighting****CNAEs:**

- 43.29-1/04: Assembly and installation of lighting and signaling systems and equipment on public roads, ports and airports.

**Description:**

Activity involving the assembly and installation of systems and equipment intended for lighting and signaling public roads, ports and airports, including public lighting infrastructure.

**Examples of activities:**

- Upgrades to the existing lighting infrastructure to replace the current lighting with high-efficiency, long-life LED lamps.
- New LED lighting infrastructure.
- Solar public lighting that integrates photovoltaic panels and storage batteries into public lighting systems to harness sunlight during the day and store energy in batteries to turn on the lights at night, also promoting off-grid installations.

**Out-of-scope activities:**

- Installation of fluorescent or incandescent bulbs.
- Non-optimized public lighting, without intensity control or timing.
- Installations that depend on fossil fuels.

**Substantial contribution to Objective 1 — Climate change mitigation**

The activity directly qualifies as a substantial contribution to climate change mitigation.

**Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

**Do no significant harm (to any of the following objectives):**

Climate change adaptation

- For new projects, develop robust lighting systems that are resistant to extreme weather events.

Protection and restoration of biodiversity and ecosystems

- N/A

Do no significant harm (to any of the following objectives):	
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>When replacing fluorescent lamps with LEDs, the fluorescent lamp must be disposed of properly to prevent gas leakage into the atmosphere.</li> <li>Establish partnerships with companies that use sustainable and recyclable materials in lighting and signaling projects.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Ensure that lighting does not cause light pollution and complies with local regulations.</li> <li>Develop regular maintenance protocols for lighting systems to ensure efficiency and minimize waste generation.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### ***D17: Implementation of solar heating panels and technologies for water heating***

#### **CNAEs:**

- 35.30-1: Production, storage and distribution of steam and hot water for heating, heating systems, energy, and other uses.

#### **Description:**

Assembly and installation of solar heating systems to heat water in homes, industries and commercial establishments, including the use of solar thermal collectors.

#### **Examples of activities:**

- Installation of solar heating systems in homes to heat water for showers and taps.
- Use of solar panels to heat water in industrial processes.

#### **Substantial contribution to Objective 1 — Climate change mitigation**

The activity directly qualifies as a substantial contribution to climate change mitigation.

#### **Do no significant harm**

The DNSH criteria for this activity complement the substantial contribution criteria to ensure that its implementation does not cause adverse impacts on TSB's other climate, environmental and socio-economic objectives.

Do no significant harm (to any of the following objectives):	
Climate change adaptation	<ul style="list-style-type: none"> <li>Develop systems that adjust to seasonal temperature variations to ensure year-round efficiency.</li> <li>Ensure safe facilities that can withstand extreme weather effects.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>Adopt high-efficiency technologies to optimize the use of natural resources.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Reuse materials from previous projects in the construction of solar heating systems, thereby optimizing resources.</li> <li>Establish partnerships with manufacturers that use sustainable and recyclable materials in the panels, whenever possible.</li> <li>Implement a reverse logistics system to ensure the proper disposal of materials in the event of breakage, obsolescence or end of life.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Develop regular maintenance protocols to ensure that the systems operate efficiently, guaranteeing efficiency and minimizing waste generation.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### ***D18: Research, development and innovation activities for the sector***

#### **CNAEs:**

- 71.0: Architecture and engineering services; technical tests and analyses
- 72.10-0: Research and experimental development in physical and natural sciences

#### **Description:**

This category covers activities related to research, development and implementation of innovative solutions, processes, technologies and business models aimed at reducing, eliminating or preventing emissions in the CNAE D sector. It also includes individual measures and professional services needed to ensure that economic activities comply with the objectives of the TSB. The solutions developed must demonstrate their ability to contribute significantly to the climate change mitigation objective of the sector's activities.

#### **Out-of-scope activities:**

Activities linked to the improvement of technologies and processes for the use of fossil fuels.

#### **Substantial contribution to Objective 1 — Climate change mitigation**

Creation of intangible assets and conducting research, development, and innovation activities explicitly aimed at facilitating compliance with the TSB's substantial contribution criteria and achieving the limits established for the CNAE D sector.

## ***Cross-cutting appendix: Carbon Capture and Utilization (CCU and BECCU)***

### **Description:**

All activities using Carbon Capture and Storage (CCS) or Carbon Capture Utilization and Storage (CCUS) in compliance with the applicable criteria must also meet the specific criteria established for CCS technology. This appendix is not a standalone document and must be applied when CCS is mentioned as a requirement within another activity.

It is included the implementation, operation, modernization, or expansion of systems to capture CO<sub>2</sub> from stationary sources and use this carbon in the manufacture of durable products. A includes both fossil carbon (FCC) and biogenic carbon (BECCU).<sup>6</sup>

### **Examples of activities:**

- Capture of CO<sub>2</sub> from industrial processes<sup>7</sup>
- Capture of CO<sub>2</sub> in biomass cogeneration plants and ethanol distilleries
- Use of CO<sub>2</sub> in the manufacture of recyclable plastics such as PET, polyurethanes and other thermoplastic resins

### **Out-of-scope activities:**

- Applications of fossil-derived CO<sub>2</sub> in short-lived products that result in its rapid release into the atmosphere (e.g., carbonated drinks, urea, and fuels);
- Carbon capture in economic activities that are not eligible under the TSB;
- Use of CO<sub>2</sub> for enhanced oil recovery (EOR) or any purposes associated with the exploitation of fossil fuels.

### **Substantial contribution to Objective 1 — Climate change mitigation**

The activity will be considered qualified if it meets the following criteria:

- A. The source of CO<sub>2</sub> must come from an economic activity already qualified by the TSB or explicitly referenced in the activities with decarbonization potential.
- B. The use of captured fossil CO<sub>2</sub> must result in its fixation in long-lasting products or recyclable materials, with technical evidence of the permanence of the carbon through life cycle assessments (LCA) or equivalent recognized methodologies.
- C. In the case of fossil carbon capture, it must be demonstrated that implementation of the technology does not imply an increase in Scope 1 and 2 GHG emissions, according to the following parameters:
  - i. For applications in the industrial sector: emissions (Scope 1 and 2) per unit produced must remain equal to or lower than the levels prior to the installation of the technology.
  - ii. For applications in the energy sector: emissions (Scope 1 and 2) per unit generated (e.g., tCO<sub>2</sub>e/MWh) must remain equal to or lower than the levels prior to the installation of the technology.

<sup>6</sup> Activity only applies to the other activities included in this technical chapter.

<sup>7</sup> Industrial processes mentioned in this technical chapter.

- D.** Appropriate systems for monitoring, verification, and reporting of avoided or removed emissions must be implemented, with verification by an independent third party.

## Objective 2 — Climate change adaptation

The energy sector in Brazil faces growing challenges in the context of a changing climate. Factors such as changes in precipitation patterns, prolonged droughts and extreme weather events, including storms and heatwaves, create significant vulnerabilities in energy production, distribution and consumption. These conditions highlight the importance of focusing on resilience within the energy system. Elements such as diversification of energy sources, increased energy efficiency and strengthened infrastructure play a key role in the sector's ability to adapt to climate fluctuations and ensure a more stable and sustainable energy supply in the future.

### Categories of eligible activities

- DA1: Adaptation of hydroelectric power generation
- DA2: Adaptation of wind power generation
- DA3: Adaptation of solar power generation
- DA4: Adaptation of electricity generation from thermal sources using renewable biomass, biogas, biomethane, and other fuels
- DA5: Adaptation of electricity transmission and distribution

### Criteria for substantial contribution: types of technical criteria applied

The qualified activities and measures in the electricity and gas sector apply the following types of technical criteria:

- **Directly qualified:** activities or measures with low risk of maladaptation and high potential for substantial contribution to Climate change adaptation are directly qualified.
- **Quantitative/verifiable criteria:** substantial contribution criteria for activities that are based on verifiable indicators (e.g., % of water savings, design of payback periods for hydraulic systems, etc.)
- **Qualitative criteria:** substantial contribution criteria determined by a set of qualitative criteria and checks (e.g., forest management plan, audit, stakeholder involvement, etc.).
- **Vulnerability assessment:** for any other activity or measure not listed in the Adapted and Enabling Activities, a detailed vulnerability assessment is required to show that this activity/measure contributes to improving the sector's resilience. This applies to both adapted and enabling activities/measures. The methodology for this assessment is described in Annex A2.

#### How to use these criteria:

Listed below are the activities/measures that have specific criteria for making a substantial contribution to the Climate change adaptation objective. The activities are defined as economic activities that usually have a CNAE code, while measures are the lower-scale components of an activity. Each activity and measure indicate the threat (or threats) it addresses. In addition to these measures, it is also possible to present a vulnerability assessment along with an activity aimed at mitigating its risk. The criteria for this assessment are described in Annex A2. All measures with a substantial contribution to the Climate change adaptation objective must also meet the cross-cutting DNSH criteria presented in Table 1.

## Adapted and enabling activities and measures

### DA1: Adaptation of hydroelectric power generation

#### CNAEs:

- 35.11-5/01: Electricity generation
- 42.21-9/01-03: Construction works for electricity generation and distribution, and for telecommunications

#### Description:

- Construction, expansion, operation, modernization of hydroelectric plants adapted to water stress

#### Threat

Water stress

#### Substantial contribution to Objective 2 — Climate change adaptation:

Demonstrate climate risk reduction or improved resilience through:

- For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;
- For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.

Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2.

#### Do no significant harm:

In addition to the criteria described in the table below, the DNSH criteria for the economic-social objective of reducing socio-economic inequalities, considering gender and race aspects, listed in Annex A1, must also be met, along with the cross-cutting DNSH criteria specific to the Climate change adaptation objective.

#### Do no significant harm (to any of the following objectives):

Climate change mitigation	<ul style="list-style-type: none"> <li>• The activity does not negatively affect the mitigation efforts of other public or private agents.</li> <li>• The activity does not lead to an increase in net GHG emissions.</li> <li>• The activity is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Build fish ladders and flow detours to ensure the migration of aquatic species, if indicated by the environmental agency under the Environmental Licensing process scope.</li> <li>• Conduct periodic biodiversity assessments in adjacent areas to identify and mitigate impacts.</li> <li>• Manage the removal of flora and fauna in the event of reservoir construction.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Conduct forest compensation measures defined in the environmental licensing, integrating soil use planning with conservation strategies in the zones of influence.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Sustainable use and protection of water and marine resources	<p>In accordance with local regulations, all technically feasible and ecologically relevant mitigation measures must be implemented to reduce adverse impacts on water, as well as on protected habitats and species directly dependent on water.</p> <ul style="list-style-type: none"> <li>• The measures include, where relevant and depending on the ecosystems present in the affected water bodies: <ul style="list-style-type: none"> <li>○ Measures to ensure fish migration upstream and downstream (such as fish-friendly turbines, fish guidance structures, fully functional fish passages, and measures to interrupt or minimize operations and discharges during migration or spawning periods);</li> <li>○ Measures to ensure minimum ecological flow (including mitigation of rapid and short-term variations in flow or hydro-peak operations) and sediment flow;</li> <li>○ Measures to protect or improve habitats. The effectiveness of these measures is monitored in the context of the authorization or permit that establishes the conditions aimed at achieving good status or potential of the affected water body.</li> </ul> </li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Prioritize recycling, composting, reuse, and other sustainable treatments in the solid waste management throughout the project's life cycle, including prioritization of recyclable materials for infrastructure construction, if technically feasible.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Develop a water quality monitoring plan.</li> </ul>
Reduction of socio-economic inequalities, including racial and gender disparities	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

**DA2: Adaptation of wind power generation****CNAEs:**

- 35.11-5/01: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description:**

Construction, expansion, operation and/or upgrading of wind energy facilities adapted to damage caused by extreme events.

**Threat**

Storm damage

**Substantial contribution to Objective 2 — Climate change adaptation:**

Demonstrate climate risk reduction or improved resilience through:



- For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;
- For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.

Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2.

#### Do no significant harm:

In addition to the criteria described in the table below, the DNSH criteria for the economic-social objective of reducing socio-economic inequalities, considering gender and race aspects, listed in Annex A1, must also be met, along with the cross-cutting DNSH criteria specific to the Climate change adaptation objective.

Do no significant harm (to any of the following objectives):	
Climate change mitigation	<ul style="list-style-type: none"> <li>• The activity does not negatively affect the mitigation efforts of other public or private agents.</li> <li>• The activity does not lead to an increase in net GHG emissions.</li> <li>• The activity is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct studies to identify and mitigate risks to migratory birds and endangered species.</li> <li>• Create areas around the turbines where human activities are restricted to protect the local fauna, if indicated by the environmental licensing process.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Prioritize installation on human-modified land, minimizing the occupation of natural areas, creating plans for land restoration and multiple uses. For each turbine installed, contribute to habitat conservation projects.</li> </ul>
Sustainable use and protection of water and marine resources	<p>In the case of deployment offshore:</p> <ul style="list-style-type: none"> <li>• Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> <li>• Adopt technologies to reduce the noise generated by operations, protecting marine fauna.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Establish partnerships to recycle or reuse parts of wind turbines at the end of their life cycle and to use recycled materials in construction (e.g., cement made from slag).</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Design turbines to minimize the impact of noise and intermittent shading on neighboring communities; regularly measure noise levels and shadowing effects.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### **DA3: Adaptation of solar power generation**

#### **CNAEs:**

- 35.11-5/01: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

#### **Description:**

Construction, expansion, operation and/or improvement of solar power generation facilities, with equipment adapted to thermal stress.

#### **Threat**

Heat stress

#### **Substantial contribution to Objective 2 — Climate change adaptation:**

Demonstrate climate risk reduction or improved resilience through:

- For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;
- For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.

Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2.

#### **Do no significant harm:**

In addition to the criteria described in the table below, the DNSH criteria for the economic-social objective of reducing socio-economic inequalities, considering gender and race aspects, listed in Annex A1, must also be met, along with the cross-cutting DNSH criteria specific to the Climate change adaptation objective.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change mitigation	<ul style="list-style-type: none"> <li>• The activity does not negatively affect the mitigation efforts of other public or private agents.</li> <li>• The activity does not lead to an increase in net GHG emissions.</li> <li>• The activity is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct environmental and forest compensation measures defined in the environmental licensing, integrating the soil use planning with conservation strategies in the zones of influence.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Prioritize the use of non-productive land for the installation of solar panels and ensure that the areas of implantation have not been converted from natural vegetation. Implement floating solar panels on reservoirs to maximize efficiency and reduce land occupation, especially in hydroelectric plants, whenever possible.</li> <li>• Use the most efficient technologies in the category, improving the ratio of energy generated per occupied area.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Prioritize water-saving cleaning methods, such as dry-cleaning systems or rainwater reuse.</li> </ul>

**Do no significant harm (to any of the following objectives):**

Transition to a circular economy	<ul style="list-style-type: none"> <li>Establish a system or seek partnerships for collecting and recycling solar panels at the end of their life cycle.</li> <li>Promote the use of low environmental impact materials in the manufacture of solar modules.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

***DA4: Adaptation of electricity generation from thermal sources using renewable biomass, biogas, biomethane and other fuels*****CNAEs:**

- 35.11-5/01: Electricity generation
- 42.21-9: Construction works for electricity generation and distribution, and for telecommunications

**Description**

Construction, expansion, operation and/or upgrade of biomass energy generation facilities, with equipment adapted to thermal stress, including renewable biomass, biogas, biomethane, or other renewable fuels, using a mixture of biogas/biomethane with natural gas.

**Threat**

Heat stress

**Substantial contribution to Objective 2 — Climate change adaptation:**

Demonstrate climate risk reduction or improved resilience through:

- For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;
- For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.

Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2.

**Do no significant harm:**

In addition to the criteria described in the table below, the DNSH criteria for the economic-social objective of reducing socio-economic inequalities, considering gender and race aspects, listed in Annex A1, must also be met, along with the cross-cutting DNSH criteria specific to the Climate change adaptation objective.

**Do no significant harm (to any of the following objectives):**

Climate change mitigation	<ul style="list-style-type: none"> <li>The activity does not negatively affect the mitigation efforts of other public or private agents.</li> </ul>
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Do no significant harm (to any of the following objectives):	
	<ul style="list-style-type: none"> <li>The activity does not lead to an increase in net GHG emissions.</li> <li>The activity is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>Ensure that biomass is sourced from suppliers that use sustainable agricultural practices, such as crop rotation and soil conservation. Implement protection areas around biomass sources to preserve local biodiversity.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>Prioritize cogeneration, using only raw materials from secondary production such as agricultural and forestry waste, as long as their use does not compromise ecological functions or other sustainable uses, such as soil protection between crops.</li> <li>Adopt technologies with high conversion efficiency.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>A water resources management plan should be drawn up, specifying when the freshwater aquifers will be used and whether they are currently used for human consumption.</li> <li>The assessment of local water availability must demonstrate that the water used in biomass production does not impact the availability for human consumption and agriculture.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>Use agricultural and forestry residues as inputs for bioenergy generation.</li> <li>Reuse by-products from the conversion process in other applications, such as biofertilizers.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>Install filtration systems to minimize pollutant emissions during biomass combustion.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### ***DA5: Adaptation of electricity transmission and distribution***

#### **CNAEs:**

- 35.12-3: Electricity transmission
- 42.21-9/02: Construction of power distribution stations and networks

#### **Description**

Construction, expansion, operation and/or updating of energy transmission and distribution systems adapted to damage caused by storms and extreme weather events.

**Threat**

Storm damage

**Substantial contribution to Objective 2 — Climate change adaptation:**

Demonstrate climate risk reduction or improved resilience through:

- For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;
- For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.

Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2.

**Do no significant harm:**

In addition to the criteria described in the table below, the DNSH criteria for the economic-social objective of reducing socio-economic inequalities, considering gender and race aspects, listed in Annex A1, must also be met, along with the cross-cutting DNSH criteria specific to the Climate change adaptation objective.

<b>Do no significant harm (to any of the following objectives):</b>	
Climate change mitigation	<ul style="list-style-type: none"> <li>• The activity does not negatively affect the mitigation efforts of other public or private agents.</li> <li>• The activity does not lead to an increase in net GHG emissions.</li> <li>• The activity is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Conduct studies to identify sensitive areas during the construction of distribution systems and transmission lines and substations.</li> <li>• Implement measures to protect habitats and endangered species in passage areas.</li> </ul>
Conservation, sustainable management and use of soil and forests	<ul style="list-style-type: none"> <li>• Plan transmission routes that minimize fragmentation of natural habitats. Contribute to conservation projects in areas affected by construction</li> <li>• Align distribution projects with sustainable land use plans, including conservation, management and responsible use of forests.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• In the case of deployment offshore: <ul style="list-style-type: none"> <li>○ Implement measures to protect sensitive marine ecosystems, such as coral reefs and endangered species habitats.</li> </ul> </li> <li>• Adopt technologies to reduce the noise generated by operations, protecting marine fauna.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Encourage the reuse and recycling of materials during the installation and maintenance of networks.</li> <li>• Promote the recycling of materials used in transmission lines and substations at the end of their life cycle. Prioritize the use of low environmental impact materials.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Monitor and control noise levels generated by transmission equipment.</li> </ul>
Reduction of socio-economic inequalities,	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

### Do no significant harm (to any of the following objectives):

considering racial and gender aspects

## Qualified measures

Measure	Threats	Criteria
DA6. Implementation of demand response technologies and dynamic pricing to balance consumption during peak hours, reducing pressure on the electricity grid.	Heat stress/ Water stress	Directly qualified.
DA7. Installation of dry cooling systems	Water stress	<ul style="list-style-type: none"> <li>The measures must be applied to installations that meet the technical criteria in accordance with TSB sections D1–D18.</li> <li>Vulnerability Assessment, in accordance with Annex A2</li> </ul>
DA8. Large-scale energy storage facility, suitable for material risks such as water shortages or storm damage.	Storm damage/ Water stress	Directly qualified.
DA9. Investments in the use of wastewater or seawater for cooling in facilities that generate electricity.	Water stress	Directly qualified.
DA10. Reinforcement of transmission and distribution networks with more resistant materials and technologies, capable of withstanding climatic events.	Storm damage	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA11. Installation of underground power lines in critical areas and deployment of automated monitoring systems.	Storm damage	It is not a direct connection of a fossil fuel power plant to the grid.

Measure	Threats	Criteria
DA12. Installation of technologies in the electricity grid that allow real-time monitoring and automatic fault isolation features, such as smart grids.	Storm damage	Demonstrate climate risk reduction or improved resilience through: <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2
DA13. Develop rapid response plans for vulnerable areas, including backup generators and local renewable energy sources to maintain supply.	Storm damage	Directly qualified.
DA14. Installation of resized cooling units	Heat stress	Directly qualified when applied to facilities that meet the technical criteria according to TSB sections D1–D18.
DA15. Implementation of climate/energy use monitoring, forecasting and modeling systems.	Storm damage	Directly qualified.
DA16. Installation of mini/microgrids in remote areas.	Storm damage	Directly qualified.
DA17. Installation of security and emergency systems.	Storm damage	Directly qualified.
DA18. Vegetation management around transmission/distribution lines.	Storm damage	Directly qualified.
DA19. Relocation of substations.	Storm damage	Demonstrate climate risk reduction or improved resilience through: <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2
DA20. Structural reinforcement of substation roofs and walls.	Storm damage	Demonstrate climate risk reduction or improved resilience through:

Measure	Threats	Criteria
		<ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA21. Relocation of wind power facilities.	Storm damage	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA22. Expansion and construction of decentralized renewable energy storage systems.	Storm damage	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA23. Reservoir capacity adjustment.	Water stress	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA24. Spillway capacity adjustment.	Water stress	<p>Demonstrate climate risk reduction or improved resilience through:</p>

Measure	Threats	Criteria
		<ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA25. Operating hydropower plants as a flexible resource rather than a baseload plant	Water stress	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>
DA26. Expansion of personnel and equipment for the fire prevention and fighting service.	Heat stress	Directly qualified.
DA27. Execution of preventive services and works against vegetation fires	Heat stress	Directly qualified.
DA28. Set up a monitoring and warning center; and install equipment to monitor weather events.	Multi-risk	Directly qualified.
DA29. Any other activity or measure that contributes to improving the resilience of the energy infrastructure.	Multi-risk	<p>Demonstrate climate risk reduction or improved resilience through:</p> <ul style="list-style-type: none"> <li>For low or moderate risk of the asset or activity: presentation of a qualitative and/or quantitative study;</li> <li>For high-risk assets or activities: conduct a vulnerability assessment following the full process described in the specific methodology in Annex A2.</li> </ul> <p>Risk levels must be determined according to sections 1.1 and 1.2 of Annex A2</p>

Source: Own elaboration

## Cross-cutting criteria of do no significant harm (specific approach to Objective 2)

The following criteria apply to all activities and measures listed in the Adapted and enabling activities and measures, as well as any other activity that contributes to the sector's resilience, provided it is backed up by a Vulnerability Assessment (Annex A2). The criteria for do no significant harm are based on the adoption of complementary criteria to the substantial contribution criteria, with the aim of ensuring that their implementation does not cause adverse impacts on TSB's other climate, environmental and economic-social objectives.

**Table 1.** Specific do no significant harm criteria for Climate change adaptation (Objective 2)

Do no significant harm:	
Generic	<ul style="list-style-type: none"> <li>• Aligned assets and activities must adhere to the local regulatory framework and policies relevant to their activity and the territory in which they are carried out, as well as having an environmental management system in place.</li> <li>• Entities implementing economic activities or asset owners must demonstrate the existence of a management system proportional to the size of the investment and the scale of the project/entity implementing the financing.</li> <li>• The aligned activity must ensure that it does not generate a negative social impact. To achieve this, they must adhere to the relevant local regulatory framework and policies and have a social management system in place.</li> </ul>
Climate change mitigation	<ul style="list-style-type: none"> <li>• The activity/measure does not negatively affect the mitigation efforts of other public or private agents.</li> <li>• The activity/measure does not lead to an increase in net GHG emissions.</li> <li>• The activity/measure is consistent with sectoral, regional and/or national mitigation efforts.</li> </ul>
Protection and restoration of biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• New buildings must not be located in areas that are strategic for food security, rich in biodiversity or that serve as habitat for endangered species, such as those protected by national laws or included on the International Union for Conservation of Nature (IUCN) Red List.</li> <li>• If the facilities are close to sensitive areas, such as UNESCO World Heritage sites or protected areas, an assessment must be carried out in accordance with the criteria of the International Finance Corporation's (IFC) Performance Standard No. 6 or an equivalent national instrument. In addition, it is necessary to implement a long-term biodiversity monitoring program.</li> </ul>

**Do no significant harm:**

Sustainable land use and conservation, management and sustainable use of forests	<ul style="list-style-type: none"> <li>• The activity/measure does not alter the physical-chemical and biological integrity of the soil; on the contrary, it improves the state of this resource.</li> </ul>
Sustainable use and protection of water and marine resources	<ul style="list-style-type: none"> <li>• Identify, assess and manage the risks associated with water consumption and quality. Water quality risk analysis tools should be used when available.</li> <li>• If the assets or activities are located in water-stressed areas, the implementation of water use and conservation management plans, developed in consultation with the relevant local entities, must be guaranteed.</li> </ul>
Transition to a circular economy	<ul style="list-style-type: none"> <li>• Apply the principles of the Circular Economy (National Circular Economy Strategy (ENEC, 2024) or other national standards related to the removal and dismantling of plants and infrastructures).</li> <li>• Seek maximum efficiency in the use of materials, promoting reduction, repair, recycling, and reuse, as well as ensuring the proper treatment and disposal of waste, such as batteries or Waste Electrical and Electronic Equipment (WEEE), complying with the principles of extended producer responsibility (ELLEN MACARTHUR FOUNDATION, 2022).</li> <li>• Design and manufacture new facilities so that they are durable, easy to dismantle, renovate, and recycle.</li> <li>• Ensure the proper repair of facilities and equipment and the accessibility and interchangeability of equipment components.</li> </ul>
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Water discharges must comply with the discharge permits of the competent National Environmental Authority.</li> <li>• Emissions that pollute the air must have the necessary permits and comply with current national legislation, with special attention to hazardous waste.</li> <li>• The integrated management of generated waste must be carried out by duly authorized waste managers operators.</li> </ul>
Reduction of socio-economic inequalities, considering racial and gender aspects	<ul style="list-style-type: none"> <li>• Annex A1: Do no significant harm criteria for economic-social Objective 9.</li> </ul>

Source: Own elaboration

# References

AGÊNCIA NACIONAL DE ENERGIA ELÉTRICA (ANEEL). **Regras dos Serviços de Transmissão de Energia Elétrica, Módulo 2**. 2022. Available at: <https://www.gov.br/aneel/pt-br/centrais-de-conteudos/procedimentos-regulatorios/regras-de-transmissao>. Accessed: 12 set. 2025.

BARANDIARÁN, M.; ESQUIVEL, M.; LACAMBRA, S.; SUAREZ, G.; ZULOAGA, D.; TROCH, S.H. **Metodologia de avaliação de riscos de desastres e mudanças climáticas para projetos do BID**: Um documento de referência técnica para as equipes de projetos do BID. 2019. Available at: <https://publications.iadb.org/pt/metodologia-de-avaliacao-de-riscos-de-desastres-e-mudancas-climaticas>. Accessed: 12 set. 2025.

BANCO INTERAMERICANO DE DESENVOLVIMENTO (BID). **Adaptation Solutions Taxonomy**. 2020. Available at: <https://publications.iadb.org/publications/english/viewer/Adaptation-Solutions-Taxonomy.pdf>. Accessed: 12 set. 2025.

BRASIL. **Lei nº 14.948, de 2 de agosto de 2024**. Dispõe sobre a Política Nacional do Hidrogênio de Baixa Emissão de Carbono. Brasília, DF: 2024. Available at: [https://www.planalto.gov.br/ccivil\\_03/\\_ato2023-2026/2024/lei/l14948.htm](https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2024/lei/l14948.htm). Accessed: 12 set. 2025.

\_\_\_\_\_. **Lei nº 14.993, de 8 de outubro de 2024**. Dispõe sobre a promoção da mobilidade sustentável de baixo carbono e a captura e a estocagem geológica de dióxido de carbono. Brasília, DF: 2024. Available at: [https://www.planalto.gov.br/ccivil\\_03/\\_ato2023-2026/2024/lei/l14993.htm](https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2024/lei/l14993.htm). Accessed: 12 set. 2025.

BRASIL. MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO (MCTI). **Fator médio – Inventários corporativos**. 2025. Available at: <https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/cgcl/paginas/fator-medio-inventarios-corporativos>. Accessed: 12 set. 2025.

BRASIL. MINISTÉRIO DO MEIO AMBIENTE E MUDANÇA DO CLIMA (MMA). **Plano Nacional de Adaptação à Mudança do Clima (PNA)**. 2024. Available at: <http://antigo.mma.gov.br/clima/adaptacao/plano-nacional-de-adaptacao.html>. Accessed: 12 set. 2025.

BRASIL. MINISTÉRIO DE MINAS E ENERGIA (MME). **Balanco Energético Nacional 2023**. 2023. Available at: <https://www.gov.br/mme/pt-br/assuntos/secretarias/sntep/publicacoes/balanco-energetico-nacional/ben-2023>. Accessed: 12 set. 2025.

BRASIL. MINISTÉRIO DO TRABALHO (MT). **Relatório Anual de Informações Sociais – RAIS: Ano-base 2023**. 2023. Available at: <https://www.gov.br/trabalho-e-emprego/pt-br/assuntos/estatisticas-trabalho/rais/rais-2023/apresentacao-rais-2023.pdf>. Accessed: 12 set. 2025.

CONSELHO NACIONAL DO MEIO AMBIENTE (CONAMA). **Resolução CONAMA nº 237, de 19 de dezembro de 1997**. Dispõe sobre a revisão e complementação dos procedimentos e critérios utilizados para o licenciamento ambiental. 1997. Available at: [https://conama.mma.gov.br/?option=com\\_sisconama&task=arquivo.download&id=237](https://conama.mma.gov.br/?option=com_sisconama&task=arquivo.download&id=237). Accessed: 12 set. 2025.

ELLEN MACARTHUR FOUNDATION. **Responsabilidade Estendida do Produtor**. 2021. Available at: [Responsabilidade estendida do produtor: uma parte necessária da solução para o desperdício de embalagens e a poluição](#). Accessed: 12 set. 2025.

EMPRESA DE PESQUISA ENERGÉTICA (EPE). **Sistemas Isolados de Energia no Brasil**. 2021. Available at: <https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-586/EPEFactSheetSistemasIsolados.pdf>. Accessed: 12 set. 2025.

\_\_\_\_\_. **PDE 2031**. 2022. Available at: [https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/Documents/PDE\\_2031\\_RevisaoPosCP\\_rvFinal\\_v2.pdf](https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/Documents/PDE_2031_RevisaoPosCP_rvFinal_v2.pdf). Accessed: 12 set. 2025.

\_\_\_\_\_. **Anuário estatístico de energia elétrica 2024**. 2024a. Available at: <https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-160/topico-168/anuario-factsheet-2024.pdf>. Accessed: 12 set. 2025.

\_\_\_\_\_. **Plano Decenal de Expansão de Energia 2034**. 2024b. Available at: [https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-804/topico-758/PDE2034\\_Aprovado.pdf](https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-804/topico-758/PDE2034_Aprovado.pdf). Accessed: 12 set. 2025.

\_\_\_\_\_. **Balço Energético Nacional 2024**. 2024c. Available at: <https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/balanco-energetico-nacional-2024>. Accessed: 12 set. 2025.

EUROPEAN PARLIAMENT. **Circular economy: definition, importance and benefits**. 2023. Available at: <https://www.europarl.europa.eu/topics/en/article/20151201STO05603/circular-economy-definition-importance-and-benefits>. Accessed: 12 set. 2025.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). **SCN – Sistema de Contas Nacionais**. 2021. Available at: <https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/9052-sistema-de-contas-nacionais-brasil.html>. Accessed: 12 set. 2025.

MAIOR, M. M. S.; CÂNDIDO, G. A. Avaliação das metodologias brasileiras de vulnerabilidade socioambiental como decorrência da problemática urbana no Brasil. **Cadernos MetrÓpole**, v. 16. São Paulo, 2014. Available at: <https://doi.org/10.1590/2236-9996.2014-3111>. Accessed: 12 set. 2025.

MMA. (2024). Estratégia Nacional de Adaptação, Plano Clima Adaptação. Available at: <http://antigo.mma.gov.br/clima/adaptacao/plano-nacional-de-adaptacao.html>.

RAIS. 2023. *Trabalho e Emprego*. Available at: <https://www.gov.br/trabalho-e-emprego/pt-br/assuntos/estatisticas>.

SOUTO, & ATAÍDE. (S.D.) (2014). *Avaliação das metodologias brasileiras de vulnerabilidade socioambiental como decorrência da problemática urbana no Brasil*. Available at: <https://www.scielo.br/i/cm/a/S3Y8p5Mq3K5kcZqSdbNhJ4F/?format=pdf&lang=pt>.