国家电投
SPIC

GREEN FINANCE FRAMEWORK

2024

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1. Overview of SPIC

State Power Investment Corporation Limited (SPIC) is one of China's top four power generation enterprises. SPIC owns all generation types including PV, wind, nuclear, hydro, coal, gas and biomass, with PV power capacity ranking 1st in the world. Ranking 256th among the Fortune Global 500, SPIC is one of the world-class clean energy enterprises with global competitiveness.

As of July 2024, SPIC's clean energy accounted for 70.13% of the total installed capacity, with PV, new energy, clean energy capacity topping the world. Possessing 72.96 GW of PV power, SPIC is the No. 1 solar power producer in the world by total installed capacity. Owning and operating multiple onshore and offshore wind farm clusters totaling 52.19 GW, SPIC is the second largest wind power producer in the world. The company is also an important hydropower producer with cascade HPPs on the upper reaches of the Yellow River, and the Yuanshui River, a tributary of the Yangtze River, with installed capacity of 25.33 GW.

SPIC has presence in 47 countries and regions including Brazil, Australia, Malta, Pakistan, etc. Meanwhile, SPIC carries out technology collaboration with international companies like Siemens Energy, Ansaldo Energia, Westinghouse Electric Company, Tecnatom, etc. As of July 2024, SPIC owns 11.03 GW overseas assets in operation.

SPIC is a major state-owned enterprise directly under the Chinese central government. As of July 2024, SPIC has 130,000 employees and 68 subsidiary entities, including five A-share listed entities, one HKSE listed entity and two NEEQ listed entities.

2. SPIC’s Climate Strategy

2.1 Climate Strategy

Sustainability has been the cornerstone of SPIC’s development strategy. We are committed to creating a better future for the world through innovation, green, shared, and smart development.

Since the company was founded, SPIC has been actively growing its installed capacity of clean energy. Clean energy has grown from less than 40% of total installed power capacity in 2015 to 70.13% by July 2024. SPIC will continue to increase the installation of clean energy in the next decade.

SPIC positions itself as an advanced energy technology provider, clean low-carbon energy supplier, and energy ecosystem integrator. SPIC is implementing a “Balanced Growth Strategy”: balancing the scale expansion with investment capability, balancing the growth of traditional industries with innovative business models, balancing the optimization of electricity types and geographic distribution, and balancing quality enhancement of existing capacity and optimization of new capacity. Based on our core growth strategy, SPIC will further strengthen its competitive advantages and strive towards becoming a new energy platform for the industry and the world.

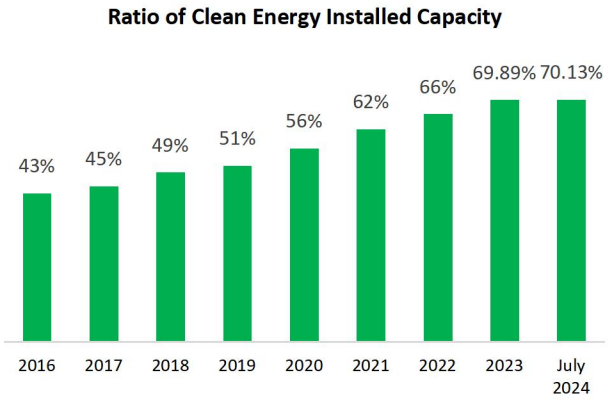
2.2 Key Levers for Energy Transition

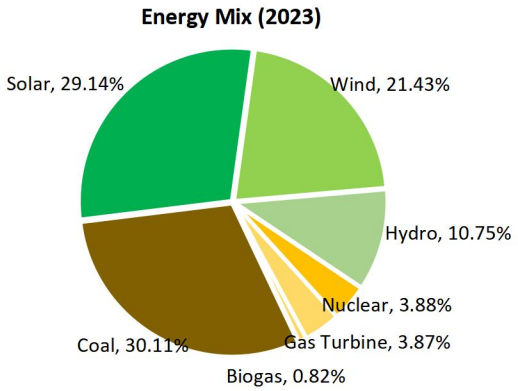
To support China’s target of **“Carbon Peak by 2030 and Carbon Neutrality by 2060”**, SPIC will act on the following initiatives:

1. Expand clean energy capacity in large scale and maintain leading position in installed capacity in solar, wind, and hydropower
2. Commit to key technologies and innovations, such as battery technologies, hydrogen energy, carbon capture, utilization and storage
3. Combine clean energy with ecological civilization construction and rural revitalization
4. Pursue energy integration and smart energy platforms
5. Reduce exposure to fossil fuels by steadily reducing the proportion of power generating from coal

2.2.1 Expand clean energy capacity in large scale and maintain leading position in installed capacity in solar, wind, and hydropower

As of July 2024, SPIC's total installed power capacity reached 244 GW, of which clean energy installed capacity was 171 GW, accounting for 70.13% of the total. SPIC will continue to expand its clean energy capacity in the next decade.





Renewable Energy - Solar Power

Over the past eight years, SPIC has been pushing forward quality development of the solar power business, with total installed capacity expanding 8 times in 8 years and reaching 72.96 GW by July 2024, ranking first in the world. SPIC has a number of world-class photovoltaic power generation bases and established over 1,200 centralised PV power generation bases across all provinces in China, as well as in Mexico, Japan, Australia, and Kazakhstan. The company maintains the No. 1 position globally for its installed capacities of PV consecutively for the last eight years.

Total Installed Capacity of Solar Power

72.96 GW

No.1 in the world

World's First Ultra-High-Altitude PV Demonstration Base in Ganzi Tibetan Autonomous Prefecture

Zhejiang Tongyu Solar PV Park

Renewable Energy - Wind Power

The total installed capacity of wind power reached 52.19 GW by July 2024, ranking second in the world. SPIC's wind power assets are distributed in 25 provinces and regions. We are also accelerating the construction of wind power bases in Inner Mongolia's Ulanqa and offshore bases in Jiangsu and Guangdong.

Total Installed Capacity of Wind Power

52.19 GW

Ranking second in the world

First Commercial Wind Farm - Shenquan Phase 2 (Jieyang Shenquan 2)

The International Fuyuan West Offshore Wind Farm, with largest installed capacity of the country's highland wind power bases

Renewable Energy - Hydropower

The installed capacity of hydropower totaled 25.33 GW by July 2024, ranking among top 10 in the world. SPIC's hydropower assets are located in 14 provinces and regions. We have undertaken the construction of two of China's 13 major basin hydropower bases (upper Yellow River and western Hunan), while developing hydropower bases in Australia and other oversea regions.

Total Installed Capacity of Hydropower

25.33 GW

Ranking among the top 10 in the world

Longyangxia Hydropower Station

Lijiaxia Hydropower Station

2.2.2 Commit to key technologies and innovations, such as battery technologies, hydrogen energy, carbon capture, utilization, and storage (CCUS)

Technology innovation remains to be one of the key pillars of SPIC's strategy. We emphasize the integration and collaboration across divisions to achieve our core strategy of technology innovation, industrial transformation, financial integration and talent protection. We are committed to increasing R&D investment every year, while setting project priorities and allocating funding efficiently and effectively. SPIC has established a result-oriented incentive mechanism and implements robust management system to maximize innovation capabilities.

Hydrogen and Clean Transportation

SPIC has been making efforts to build up the hydrogen capacity and promote coordinated development of renewable energy-based power generation and hydrogen production by green power. We are engaging in proprietary research and production of green hydrogen production equipment and battery-related technologies to accelerate innovation and demonstration in hydrogen technology projects.

During the Beijing 2022 Winter Olympics, for example, we provided 150 hydrogen buses with a range up to 650 kilometers under standard conditions, 20 minutes per refueling, and a reduction of 70kg CO_2 for every 100km traveled.

Hydrogen Bus Services in 2022 Winter Olympics

Qingteng Hydrogen Battery

SPIC is committed to implementing the Hydrogen Industry Mid- and Long-term Plan 2021-2035 set up by NDRC and National Energy Administration. We started Guoqing Technology, an unit specializing in hydrogen energy and technology. To develop and commercialize the use of hydrogen batteries, we created our own hydrogen battery brand, Qingteng, which has been adopted in heavy-duty vehicles, motors, mining machines and shipping industries.

Carbon Capture, Utilization And Storage Technology (CCUS)

SPIC utilizes its own technological and financial advantages to promote the R&D of carbon reduction technologies and the application of key demonstration projects. On Februrary 16, 2023, the first phase of the 100,000-ton CCUS Project for the power plant owned by Shanghai Elecric Power in Changxing Island was put into trial operation. It is the largest CCUS full-process project in which carbon dioxide is captured and then used as shielding gas. The first phase of the project was put into commercial operation at June 2023. By the end of December 2023, it has supplied nearly 50,000 tons of carbon dioxide and brought significant economic and social benefits.

CCUS project in Changxing Island, undertaken by SPIC Yuanda Environmental Protection

The project adopts SPIC's proprietary CO2 capture technology where the pretreated flue gas enters the carbon capture and absorption system, and connects with the absorbent. The CO2 in the flue gas is absorbed with an pabsorption efficiency of over 90%. The project is expected to reach total carbon emission reduction of about 100,000 tons/year, equivalent to planting 5.56 million trees on the island.

2.2.3 Combine clean energy with ecological restoration and rural revitalization

SPIC drives grassland ecosystem's transformation to a virtuous cycle through ecological restoration and rural revitalization. Mengdong Energy and DianTou Energy (SPIC's Inner Mongolia subsidiaries) have been actively initiating ecological restoration. SPIC has implemented six major restoration and management projects, including shaping of overburden soil, building water supply systems, conserving water and soil, soil melioration, revegetation and establishing irrigation systems. Such efforts have made significant achievement in ecological restoration. As a result, the vegetation coverage and carbon sequestration has been enhanced tremendously. Mengdong Energy and DianTou Energy have also built solar power plants in the Badain Jaran Desert, with total installed capacity of 40,000 kWh. The solar panels will serve as wind blocks and stabilizers for deserted land, which reduces wind speed and water evaporation and facilitates land restoration.

Solar Panels Installed in Badain Jaran Desert

2.2.4 Pursue energy integration and develop smart energy platforms

Integration has always been the bedrock behind SPIC's success. To transform from a traditional power generation company to an integrated intelligent energy company, we develop smart energy platforms to holistically manage and collect data from business lines to generate valuable insights for management and development.

Energy Integration

We have built an integrated energy base in northern China, where we invented world's leading technology for hydro-photovoltaic hybrid power generation. At the beginning of 2013, we built an 850 MW Longyangxia hydropower-photovoltaic power station, marking our progress in exploring multi-energy integration and innovation. On August 24, 2022, we obtained the development right for the Gonghe 3,900 MW pumped-storage power station, allowing SPIC to develop "hydro+wind+photovoltaic" integrated power storage.

Longyangxia Hydro-PV Complementary Power Station

Smart Energy Platforms

In September 2022, SPIC Integrated Smart Energy Science & Technology Co., Ltd. was incorporated. It operates in collaboration with SPIC's Integrated Smart Energy Industry Innovation Center, to explore integrated smart business growth and strengthen the group's capability in green energy supply. As of the end of 2022, SPIC integrated smart energy projects covered nearly 500 counties, with 700 projects in operation. In addition, SPIC has launched 10 pilot regions to lead and drive the implementation of Tri-network Integration.

The Tianshu system is designed to leverage digital technology to create an intelligent IOT system for integrated smart energy, electric vehicle and energy storage applications to facilitate complementation of multiple energy, interaction between supply and demand sides and the seamless connection between Internet of Things and Service. The Tianshu system includes Tianshu Cloud, an IOT platform, and Tianshu No. 1, an integrated intelligent energy management and service system.

Tianshu Cloud Platform

3. SPIC's Governance

3.1 Corporate Social Responsibility Governance

SPIC has continued to solidify its CSR-based governance system, enhanced the organizational structure for CSR, **established a leadership body for CSR, and appointed CSR coordinators in headoffice departments and subsidiaries**. It has established cross-departmental mechanisms for CSR management and coordinated advancement to ensure the implementation of CSR initiatives. The Company has formulated the **SPIC Corporate Social CSR Management Regulations** to standardize CSR management practices, alongside annual plans that outline key CSR focuses and monitor their execution. In alignment with operational realities, SPIC has also established a robust overseas CSR system to support responsible management abroad and uphold global citizenship responsibilities.

3.2 Environmental Management

SPIC stays committed to fulfilling its responsibility for ecological environment protection. To this end, the Company has formulated and released the **Responsibility System for Ecological Environment Protection of All Employees in SPIC Headoffice** in accordance with national ecological environment protection laws and regulations. This document outlines the three major systems of guarantee, supervision, and support for ecological environment protection, and the ecological environment protection duties and fulfillment criteria for all posts in the headoffice. Besides, the Company has refined the institutional system of ecological environment protection by formulating and revising management regulations such as the **Work Rules on Ecological Environment Protection Management**, established the effective work mechanism, worked out ecological environment protection plans and work plans as required, and carried out dedicated supervisions and routine inspections of ecological environment protection as planned in order to improve ecological environment protection management constantly. In addition, the Company has made efforts to ecological environment protection training. The training sessions mainly cover national laws, regulations, and policies of ecological environment protection, as well as in-house rules, regulations and management requirements in this field. In these training sessions, trainees may learn issues of ecological environment protection and typical cases, and share management practices in this field. In 2023, SPIC did not have serious violations of laws and regulations, and emergent environmental incidents in ecological environment protection.

4. SPIC Green Finance Framework

The purpose of the Green Finance Framework ("Framework") is to ensure SPIC and its subsidiaries' potential Green Bonds, Green Loans, Green Equities and other green instruments ("Green Financing Instruments") align with the Green Bond Principles 2021 as administered by the International Capital Market Association and the Green Loan Principles 2023 published by the Asia Pacific Loan Market Association, the Loan Market Association, and the Loan Syndications and Trading Association.

SPIC has prepared this Framework, with the intention to issue "Green Financing Instruments", which may include (but are not limited to):

- Green Bonds issued by SPIC or any of its subsidiaries or project companies (in various formats such as, but not limited to, Senior Unsecured, Hybrid, Project Bond) where an amount equivalent to the proceeds will be dedicated to the Eligible Green Projects as set out in the Use of Proceeds section of the Framework
- Green Loans contracted by SPIC or any of its subsidiaries or project companies where an amount equivalent to the net proceeds are dedicated to Eligible Green Projects as set out in the Use of Proceeds section of the Framework

SPIC is committed to providing information with transparency, accuracy and integrity according to the four key pillars below, as set out in this Framework:

1. **Use of Proceeds**
2. **Project Evaluation and Selection**
3. **Management of Proceeds**
4. **Reporting**

This framework also aims to align, where possible, with the requirement of EU-China Common Ground Taxonomy (CGT)

4.1 Use of Proceeds

An amount equivalent to the net proceeds from any Green Financing Instruments issued by SPIC (or any of its subsidiaries) will be used exclusively to finance and/or refinance existing or future Eligible Green Projects.

To be eligible, all projects must align with the following criteria:

Eligible Types of Investments

1) Capital expenditures and selected operating expenditures (such as maintenance costs that either increase the lifetime or the value of the assets) of tangible assets meeting the Eligibility Criteria described in the Use of Proceeds section of the Framework
2) Research and development expenditures aimed at developing new products and solutions as described by the Eligibility Criteria in the Use of Proceeds section of the Framework
3) Equity investments in "pure-play"[1] companies whose shares are not publicly traded

Eligible Green Projects

Eligible Green Projects are directly connected to SPIC's climate strategy. In order to ensure that all Eligible Green Projects provide environmental benefits, they must comply with at least one of the following Eligible Categories and Eligibility Criteria. To have a standardized definition for sustainable activities, each of the Eligible Categories are mapped to the relevant UN Sustainable Development Goals.

Eligible Green Projects are defined as SPIC's assets, investments and projects which fall under the categories listed below:

Eligible Categories	Eligibility Criteria		Contribution to UN SDGs
Renewable Energy	Solar Power	▪ Research, development, acquisition, manufacturing, construction, maintenance or upgrade of solar facilities, equipment or components (e.g. Photovoltaic plants, Floating photovoltaic, concentrated solar power)	 SDG: 7.2
	Wind Power	▪ Research, development, acquisition, manufacturing, construction, maintenance or upgrade of wind facilities, equipment or components (e.g. Onshore and offshore projects including floating wind turbines)	

[1] Companies who have at least 90% of revenue, or if not applicable 90% of the balance sheet, derived from Eligible Green Projects described in the Use of Proceeds section of the Green Financing Framework

	Hydropower	▪ Research, development, acquisition, manufacturing, construction, maintenance or upgrade of hydroelectricity facilities, equipment, or components; hydropower complies with either of the following criteria: a) Run-of-river without artificial reservoir b) Power density> 5 W/m2 c) Lifecycle GHG emission intensity < 100 gCO2e/kWh	 SDG: 13.1
	Green Hydrogen	▪ Research, development, acquisition, manufacturing, construction, maintenance and upgrade of facilities, equipment or components dedicated for producing hydrogen from electrolysis solely using renewable electricity	
Energy Storage		▪ Investment or expenditure on research, development, acquisition, manufacturing, construction, maintenance or upgrade of renewable energy storage facilities, equipment, or components	 SDG: 7.2
Transmission and Distribution Infrastructure		▪ Investment or expenditure on the improvement of existing, or development/installation of new transmission projects that aim to connect renewable energy sources, support increased deployment of renewables on the grid, or reduce GHG emissions through installation of equipment that will improve system efficiency or energy use management	 SDG: 13.1
Clean Transportation		▪ Acquisition of electric vehicles, and the investment or expenditures on construction of supporting infrastructure (e.g. charging stations and hydrogen filling stations)	 SDG: 11.2

Energy Efficiency	▪ Projects related to the upgrade of existing facilities, equipment, systems, and technology to achieve at least 30% improvement in energy efficiency ▪ Projects to reduce energy consumption, including heating and cooling networks projects, LED lighting, systems for energy management such as smart grid and smart metering ▪ Projects to optimize building and plants efficiency, such as HVAC systems renovation, insulation retrofitting, solar panels installation, heat recovery systems, motions detectors etc.	 SGD: 7.2  SDG: 9.4  SDG: 13.1
Pollution Prevention and Control	▪ Investment or expenditure on research, development, acquisition, manufacturing, construction, maintenance, or upgrade of facilities or equipment dedicated for waste recovery or other waste recycling activities	 SDG: 12.5
Environmentally Sustainable Management of Living Natural Resources and Land Use	▪ Projects that promotes the restoration of sites such as ▪ Terrestrial and aquatic biodiversity conservation ▪ Restoration of natural landscapes ▪ Decontamination of site grounds	 SDG: 15.1, 15.2
Green Innovation	▪ Research and development expenditures related to the deployment of energy efficient solutions and technology intended to improve energy efficiency ▪ Investments in the development of low- or no-carbon technologies such as CCUS, hydrogen etc.	 SDG: 11.13

4.2 Exclusion List

SPIC commits to not knowingly allocating the net proceeds from Green Financing instruments to projects and/or activities that are considered to have potential negative social or environmental impact. Such exclusion list includes but not limit to the following:

1. Projects related to development, operation, and maintenance of new or existing fossil fuel-based electricity generation capacity or heating systems, including but not limited to, coal, oil or natural gas-powered assets
2. Projects related to the nuclear energy production or trade of nuclear fuel
3. Projects related to trade and production of conflict minerals
4. Projects related to the production of palm oil
5. Projects related to the production or trade of alcoholic beverages
6. Projects related to the production or trade of tobacco products
7. Projects related to the production or trade of weapons, ammunition, and military fighting vehicles
8. Gambling related activities

4.3 Process for Evaluation and Selection of Projects

The process for project evaluation and selection ensures that the equivalent amount of net proceeds of the Green Financing Instruments are allocated to investment or expenditure that meet the Eligibility Criteria.

To ensure that allocations are made to Eligible Green Categories as specified above, SPIC has established a Green Finance Working Group ("GFWG") to oversee the selection of Eligible Green Projects and their compliance with the Eligibility Criteria. The GFWG team will be responsible for sourcing the list of Eligible Green Projects for GFWG's approval. The GFWG will meet on an annual basis or when is necessary.

The GFWG is comprised of senior representatives with ESG expertise from the Treasury team and Sustainability team. The GFWG is responsible for:

- Reviewing and validating the existing pool of Eligible Green Projects
- Replacing of Eligible Green Projects that no longer meet the eligibility criteria as defined in the Use of Proceeds section of the Framework (e.g., divestment, liquidation, concerns regarding ESG risks / alignment of underlying activity with eligibility criteria, etc.)
- Reviewing, validating, and approving the new investments or projects to be included in the pool of Eligible Green Projects
- Verifying and validating annual reporting for Green Financing instruments
- Identify material sustainability risks including climate and social risks, and conduct due diligence through controversy review on green projects

The GFWG will adhere to SPIC's internal policies and procedures to identify and manage environmental and social risks associated with financed projects. SPIC will ensure that all Eligible Green Projects comply with relevant domestic laws and regulations and international environmental and social standards.

The GFWG will continue to monitor the compliance of selected projects in terms of eligibility and compliance with exclusion criteria. If there is any material environmental and/or social controversy or adverse impact from the Eligible Green Projects identified after the proceeds' allocation, such project will become ineligible for allocation of the proceeds from Green Financing Instruments.

4.4 Management of Proceeds

An amount equivalent to the net proceeds from the Green Financing Instruments shall be allocated for the financing and/or refinancing of Eligible Green Projects. The GWFG or Treasury team of SPIC will track the allocation of the equivalent amount of net proceeds to Eligible Green Projects by establishing and maintaining a dedicated ledger (the "Ledger").

The Ledger will record, track, and manage the allocation of the equivalent amount of net proceeds. The Ledger will contain the following information:

- Green Financing Instrument issuances: type of the instrument, issuance date, maturity date, currency, amount, etc.
- List of Eligible Green Projects: eligible categories, amount, types of the project, project description
- Allocation of the equivalent amount of net proceeds by eligible categories
- Unallocated equivalent amount of proceeds

Eligible Green Projects shall qualify for refinancing with a maximum 2-year look-back period before the issuance year of the Green Financing Instrument. On best-effort basis, SPIC will fully allocate the equivalent amount of net proceeds within 2 years from the issuance date.

Pending allocation, the equivalent amount of unallocated proceeds will be held in accordance with SPIC's treasury and liquidity management policy, which can be kept as cash or cash equivalent, money market instruments, or other short-term and liquid instruments until the allocation to Eligible Green Projects.

4.5 Reporting

Until full allocation of the equivalent amount of the net proceeds of the Green Financing Instruments, SPIC shall report information on the allocation of proceeds and relevant impact information on an annual basis and in case of any material changes to the allocation. Such reporting will be available either on SPIC's corporate website or included in its annual Social Responsibility report.

The allocation reporting will include information on the aggregated allocated amounts to each Eligible Category, the description on the types of the projects financed and the unallocated equivalent amount of proceeds.

Where feasible, SPIC shall disclose the relevant information on the expected environmental benefits by eligible categories. Below are some examples of impact reporting metrics that could be reported:

Eligible Category	Examples of Impact Reporting Metrics
Renewable Energy	▪ Installed capacity (MW) ▪ Annual renewable energy production (MWh) ▪ Estimated GHG emissions avoided (tCO2e) ▪ Annual green hydrogen production (tons)
Energy Storage	▪ Annual renewable energy stored (MWh) ▪ Annual GHG emissions avoided (tCO2e)
Transmission and Distribution Infrastructure	▪ Annual GHG emissions avoided by the renewable generation facility connected by transmission and distribution assets (tCO2e)
Clean Transportation	▪ Number of electric vehicles acquired ▪ Number of charging stations installed ▪ Estimated GHG emissions avoided (tCO2e)
Energy Efficiency	▪ Annual reduction of energy consumption (%) ▪ Annual energy savings (or estimated) in MWh ▪ Annual GHG emissions avoided (tCO2e)
Pollution Prevention and Control	▪ Amount of waste recycled (tonnes)
Environmentally Sustainable Management of Living Natural Resources and Land Use	▪ Annual contribution in ha or m^2 to land remediated/ decontaminated/ regenerated
Green Innovation	▪ Qualitative description of technology developed through investments

4.6 Pre-issuance External Review

SPIC has obtained a **Second Party Opinion** from Moody's, which confirms the Framework's alignment with the Green Bond Principles and Green Loan Principles. The Second Party Opinion report is publicly available on Moody's website.

5. Appendix

5.1 Amendments to This Framework

SPIC will review this Framework from time to time, including its alignment with updated versions of the GBP and GLP, as and when such updates are made publicly available. Future updates to this Framework, if any, will be published on SPIC's website and will replace this Framework.

5.2 Mapping to China-EU Common Ground Taxonomy ("CGT")

Eligible Project Category	Relevant CGT Category
Renewable Energy	**D1.1** Electricity generation using solar photovoltaic technology **D1.3** Electricity generation using wind power **D1.5** Electricity generation using hydropower
Energy Storage	**D1.8** Storage of electricity
Transmission and Distribution Infrastructure	**D1** Electric power transmission and distribution
Clean Transportation	**H1.3** Construction and operation of facilities for shared transport, including motorbikes, passenger cars and light commercial vehicles
Energy Efficiency	**C5.7** Manufacture high-efficient generator and generator sets **F1.2** Renovation of existing buildings
Pollution Prevention and Control	**E2.1** Collection and transport of non-hazardous waste in source segregated fractions **E2.2** Recycling non-hazardous waste in source segregated fractions