Greenergy Group

Hungarian energy service company

Scope ESG Analysis has assessed the alignment of the Green Bond Framework (Framework) of Greenergy Group (Greenergy) with the 2021 Green Bond Principles (GBP) of the International Capital Market Association (ICMA), according to Scope ESG Analysis's public proprietary methodology. Scope's ESG Assessment reveals that Greenergy's Framework is fully aligned with the GBP.

This second-party opinion is based on four GBPs: use of proceeds, process for project evaluation and selection, management of proceeds, and reporting. Our methodology enhances considerations about the 'use of proceeds' with three additional dimensions: i) an assessment about the 'impact of proceeds', ii) an assessment of alignment with the EU taxonomy, and iii) a review of environmental and social risks. The Framework has received two leaves, which signals a significant positive environmental contribution.

Table 1: Issuance assessment summary

Scope's criteria	Greenergy's Framework description	Scope ESG Assessment
Use of proceeds	→ Renewable energy → Energy efficiency → Clean transportation	Aligned
Process for project evaluation and selection	→ Establishment of a green committee comprising the CEO and CFO of the company and an external sustainability expert. The committee manages the process evaluation and selection of green projects. → Greenergy has established exclusion criteria for the eligible projects	Aligned
Management of proceeds	→ Proceeds documented and updated in a green register managed by the Finance department. → The green committee will oversee and supervise the management of bond proceeds. → Refinancing share not specified but will not exceed 40%.	Aligned
Reporting	→ Annual reporting on the allocation of proceeds until full allocation → Impact metrics include annual greenhouse gas emissions avoided, renewable energy generation and capacity of renewable energy plants installed (MW)	Aligned
Greenergy's sustainability strategy	→ Absence of corporate sustainability strategy but sustainability targets established to 2025	Limited
EU taxonomy alignment	→ Greenergy's activities fall under seven taxonomy sectors related to renewable energy technologies, energy efficiency, and clean transportation. → Greenergy is aligned with technical screening criteria and minimum social safeguards and partially aligned with the DNSH criteria.	Taxonomy-aligned
Impact of proceeds	→ Greenergy's projects aim to decrease energy-related emissions in Hungary. → Greenergy targets the main pillars for energy transition with its Framework.	Significant
Environmental and social risks	→ Greenergy complies with EU and Hungarian regulations on waste management, environmental criteria, and health and safety for its projects	Significant

Figure 1: Greenergy's Environmental Framework Assessment

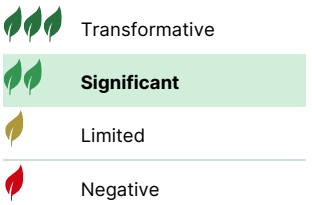

Figure 2: Alignment with United Nations Sustainable Development Goals

Figure 3: Engagement with EU Taxonomy draft regulation

Methodology and assessment process

We were commissioned by the issuer to provide a second-party opinion on its Framework. We based our opinion on: Greenergy's internal documents, interviews with Greenergy's relevant stakeholders, documents on external market/regulatory research, and data from our proprietary database.

The "leaf score" summarises our evaluation and verification of the environmental impact of Greenergy's Framework. The targets described within each of the green project categories lead to individual leaf scores. In the case of multiple project categories, the aggregate of the scores yields the overall score of our second-party opinion report.

Our minimum requirement for GBP alignment is that each green project category of the Framework has a positive environmental impact, as represented by one green leaf.

Table 2: Sector criteria leaf score

Scoring	Description	GBP category	Sector criteria
	Transformative environmental contribution and complete alignment with relevant national and industry standards	Renewable energy	Production complies with highest market standards in sustainable production and power generation during use-phase. Supply chain and end-of-life management process is covered and goes beyond industry practices
		Energy efficiency	Use of groundbreaking energy storage batteries that do not depend on critical minerals, and building renovations that contribute to at least 30% energy efficiency compared to pre-renovation levels
		Clean transportation	Zero-direct-emissions transportation and supportive infrastructure, such as charging stations operating with renewable energy
	Significant environmental contribution and at least partial alignment with relevant market standards	Renewable energy	Transparency on supply chain, environmental footprint of production and power generation during use-phase. Reference to waste and/or end-of-life practices were considered
		Energy efficiency	Energy storage batteries with high recycling rate for critical minerals in the end-of-life. Renovations that contribute to energy efficiency compared with alternatives
		Clean transportation	Hybrid vehicle that reduces current emissions and the support infrastructure such as charging stations operating on existing public energy grid
	Environmentally friendly but insufficient quantifiable impact metrics and limited alignment with relevant market standards	Renewable energy	Selective information provided on supply chain and environmental footprint of production and end-of-life practices
		Energy efficiency	No quantifiable energy storage capacity. No measurable energy efficiency contribution compared with pre-renovation levels
		Clean transportation	Transportation that reduces emissions but does not contribute to long-term transformation and transportation infrastructure that can be environmentally harmful in its construction
	No significant or negative environmental impact; lack of alignment with relevant market standards	Renewable energy	Negative impacts from production, use-phase, and end-of-life relative to market practices
		Energy efficiency	Energy storage batteries that contribute to an increase of GHG in the lifecycle of the battery. Energy-intensive building renovations that contribute to an increase of energy consumption.
		Clean transportation	Transportation or transportation infrastructure that increases the emissions output

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Introduction

Greenergy provides a full range of services in the energy sector.

Greenergy Group, majority owned by KÉSZ Group, is a Hungarian-owned independent energy company established in 2007. The company is mainly active in high-efficiency cogeneration (electricity and heat) and small-scale renewable power plants. Greenergy group is composed of four subsidiaries: Greenergy-Power Kft., Kaptár B Kft., Greenergy-Trade Kft., and Greenergy Service Kft, each one of them with a specific approach.

Greenergy's activities are focused on energy production, power-plant services, energy trading, and energy consulting. For energy production, the company relies on 26 small gas-fired cogeneration power plants with a total capacity of 55 MW, as well as three wind, three solar, and two biomass heating power plants. Greenergy's main activity is based on combined heat and power generation which produce heat near public institutions such as hospitals and district heating plants and is directly delivered to consumers. The generated power is mostly sold by the Greenergy-Trade company to the power and capacity markets or directly to energy consumers. Greenergy also provides full-range operation and maintenance activities for small power plants owned by the company and for gas-driven small power plants of external parties which are operated by Greenergy. Finally, Greenergy provides complex purchasing and consulting services to consumers to optimise energy-intensive systems through its Greenergy Service department.

Proceeds to finance renewable energy projects, energy efficiency, and clean transportation projects in Hungary

Greenergy intends to issue a green bond where 80% of the proceeds will be to finance the installation of various renewable energy projects such as solar power plants, wind turbines, and add extra biomass capacity until 2026; 15% of the proceeds will finance projects in energy efficiency and 5% will support infrastructure services for clean transportation.

Greenergy's sustainability strategy

Greenergy's activities on clean energy contribute to the energy transition by providing renewable energy in alignment with Hungary's efforts to decarbonise its energy mix and meet national and EU-wide climate objectives.

Greenergy to achieve sustainable targets by 2025.

While Greenergy does not publish a specific sustainability strategy, the company has committed in its Framework to achieve targets by 2025 such as a production portfolio with more than 25% renewable energy, reducing CO_2 emissions per energy produced by 20% in g/kWh from 2021 levels, and increasing storage capacity by 50% by 2025 from 2023.

The Framework can be interpreted as the main driver of the company's expected contribution to environmental objectives.

Greenergy's sustainability strategy score: **Limited**

Our assessment: While Greenergy mentions quantitative targets to achieve by 2025, we note there is no explicit sustainability strategy that complements the mentioned targets; therefore, it scores one leaf as its sustainability strategy is limited in terms of defined processes-related objectives, strategies and policies, and publicly disclosed metrics.

Green Bond Principles: assessment of issuance

Use of proceeds

Table: 3: Greenergy's eligible projects

Green project category	Fulfilment	Leaf score
Renewable energy	→ New or existing investments in or expenditures on the acquisition, development, construction, and/or installation of the following renewable sources: • Solar PV • Wind farms • Biomass → It also includes the transmission, distribution, and electrical storage infrastructure (solar PVs) related to renewable energy production.	Significant
Energy efficiency	→ Expenditure on the R&D, operation, distribution, and maintenance of equipment or technology helping reduce energy consumption and increase energy savings, such as: • Energy storage • District heating • Smart grids • Efficient lighting → Participations in building insulation programs. → Major renovations of existing properties that result in reduction of carbon emissions	Significant
Clean transportation	→ Investments in or financing relevant infrastructure (such as EV charging stations, EVs, hydrogen refuelling, or other investments supporting low-carbon transportation methods) and acquisition of zero- or low-emission vehicles.	Significant

Green bond proceeds to finance new solar, wind plants in Hungary

The **renewable energy project category** has scored two leaves based on Greenergy's intention to increase its share of renewable energy output in Hungary by financing the installation and construction of new solar and wind capacity. The company aims to install 20 MW in solar capacity by 2025-2026 in addition to three wind projects with a capacity of 4.1 MW. Greenergy also plans to finance additional biomass capacity by 2026 in its power plants. Bond proceeds will be specifically used to finance the design and construction of the new renewable power plants and part of the revenue from production will be used for the maintenance and operation of the facilities. The production of the renewable energy facilities, however, is associated with a negative environmental impact, given that Greenergy's supply chain has an energy mix dominated by non-renewables. We provide further information on the environmental impact and risks on page 9 of this document.

Greenergy to install two energy storage facilities

The **energy efficiency project category** scores two leaves, based on Greenergy's plan to finance the installation of two energy storage facilities in 2024 for solar-powered and gas-fuelled power plants using lithium iron phosphate (LFP) technology. The capacity of these two energy storage facilities will be 2.5 MW/5 MWh and 1.2 MW/2.5 MWh, respectively. The production of LFP batteries, however, is associated with a negative environmental impact given the energy mix in the Greenergy supply chain. We provide further information on the environmental impact and risks on page 9 of this document.

Major renovations to improve buildings' energy efficiency

In the energy-efficiency project category, Greenergy aims to finance significant renovations of existing properties that contribute to reducing energy consumption and improving energy performance. The renovations include upgrades to heating and cooling networks, lighting and shutter replacement, modernisation of product equipment, façade replacement, and other

renovations, all aimed at optimising buildings' energy efficiency. However, Greenergy has not provided quantitative information regarding the minimum percentage of energy efficiency improvement required and/or targeted compared to pre-renovation levels nor have they specified improvements to the energy performance certification label. Therefore, we are unable to measure the ambition of this project. The bond proceeds might also finance the installation or acquisition of new office buildings with improved energy efficiency. Finally, Greenergy aims to use the bond proceeds to participate in state programs to improve building insulation.

Bond proceeds partly used shift vehicle fleet to EVs

The **clean transportation project category** has scored two leaves as Greenergy aims to invest in supporting infrastructure services for clean transportation such as charging stations for EVs on site, and acquisition of an EV fleet. We note that this project is to finance Greenergy's corporate fleet and charging stations by targeting 20% of their fleet with EVs and at least one charger installed by 2025 on its premises. The Framework does not refer to mass installation of such charging stations but installation of these on their own sites operating with its own renewable energy sources. We highlight the use of renewable energy for operating the EV charging stations as best practice, which goes beyond market standards and represents a transformative environmental contribution. However, the impact is limited due to the target of just one charging station by 2025.

Greenergy's projects score: **Significant**

Our assessment: Greenergy's eligible projects scored an aggregate of two leaves as the projects' descriptions are clear, detailed, and comply with the GBPs. We note that Greenergy's Framework includes "Other eligible categories" in the project list that are not registered. Scope has not assessed these categories and this SPO is exclusively related to the three project categories specifically mentioned in the Framework and on this document.

Process for project evaluation and selection

Establishment of a green committee chaired by the CEO

Greenergy has established an internal green bond committee for the management, evaluation, and selection of eligible projects within its Framework. The committee comprises the CEO, the CFO, and a potential external sustainability advisor to contribute to the proper sustainable impact and risk assessment of eligible projects. The green committee is headed by the CEO and the allocation of the bond proceeds requires a consensus decision.

The committee will be responsible for the validation of the selected projects, acquisitions, and R&D investments, and will review the projects' allocations. The projects must be compliant with the national laws and regulations, as well as with Greenergy's internal policies.

Greenergy has an exclusion criterion for the allocation of bond proceeds to projects and assets to exclude oil and coal, nuclear energy generation, R&D related to weapons and defence industries, negative environmental resource extraction, gambling, and tobacco.

Project evaluation and selection score: **Transformative**

Our assessment: The process for project evaluation and selection scores three leaves as Greenergy's has a precise project selection process with a defined exclusion criteria to reduce negative environmental impact.

Management of proceeds

Establishment of a green finance register

The proceeds from the green bond will be managed by the green committee in a separate green register maintained exclusively by the Finance department to support the green projects. The green committee will oversee and supervise the use of proceeds in alignment with eligible projects to ensure their proper allocation and transparency.

Throughout the lifespan of the green bond, if a project or asset no longer qualifies as eligible, the amount equal to the allocated funds will be replaced by another eligible project or asset according to the green bond Framework.

Greenergy intends to allocate the proceeds within 24 months from its issue date. The proportion of proceeds to finance new projects vs refinancing existing projects is still not decided by the issuer, however in internal communications between Scope and Greenergy, the issuer stated that the refinancing share will not exceed 40%.

The unallocated proceeds will be invested in cash, short-term liquid securities investments, and/or money market instruments. The Greenergy's Finance department will monitor that the proceeds are not temporarily placed in non-green financing or refinancing activities and are aligned with the investment policy and the criteria set out in the Framework.

Our assessment: Greenergy's management of proceeds has scored three leaves as the company has a well-designed and transparent process to track investments and has a process in place for unallocated net proceeds or proceeds from sudden divestment. Greenergy is transparent on the temporary placement of unallocated proceeds and will prevent investment controversies.

Greenergy's management of proceeds score: **Transformative**

Reporting

Greenergy is committed to providing investors an annual report on its website describing the allocation of green proceeds and, where feasible, the environmental impact of the selected green projects until bond maturity. The allocation and impact reports will be verified by an external party.

Allocation and impact reports to be published annually

The allocation report will include relevant information on the use of proceeds, a breakdown of proceeds in relation to eligible projects and a detailed description of the financed activities. In addition, the allocation report will include the metrics detailed in the table below:

Table 4: Allocation reporting indicators

Allocation report indicators
Total amount of green bond proceeds
Use of green bond proceeds: percentage of green bond proceeds deployed
Use of green proceeds by projects: distribution of green proceeds used between eligible projects
Environmental impacts of the eligible projects
Share of refinanced activities in project categories
Other relevant indicators

In accordance with the 2021 Harmonised Framework for Impact Reporting[1], Greenergy has committed to provide annual reporting on selected environmental impact indicators for its projects which will be measured based on renewable energy production and greenhouse gas (GHG) emissions. The impact report will illustrate the expected and achieved environmental impact made by the projects to which the proceeds have been allocated.

The defined impact indicators will be published annually.

[1] https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Handbook-Harmonised-Framework-for-Impact-Reporting-June-2021-100621.pdf

Table 5: Impact reporting indicators

Category	Impact indicators
Renewable energy	Renewables capacity addition MW annually
	Capacity of renewable energy plants in MW
	Annual avoided emissions p.a. in tonnes of CO_2eq
	Annual renewable energy generation in MWh or renewable gases production/injection in MWh or % of estimated transported renewable energy
	Annual greenhouse gas emissions avoided in tons of CO_2eq.
Energy efficiency	Annual energy savings in % or in MWh compared to conventional technology
	Annual greenhouse gas emissions reduced/avoided in tonnes of CO_2eq
	Amount of stored energy in kWhe
	Renewable share of stored energy in %
Clean transportation	Number of EV charging stations
	New EV charging points in reporting year
	Annual CO_2 emissions reduced/avoided per passenger-km (passenger activities) or reduction of harmful emissions (NOx, SOx, PM, CO, and NMVOCs) in mgr per km
	Annual absolute greenhouse gas emissions avoided in tCO_2eq by EV fleet
	Total power of EV charging stations in MWh
	Reduction of energy used vs the current fleet relative to 2022

Our assessment: Greenergy's reporting process has scored three leaves as it is fully aligned with the GBPs and provides additional information on the use of proceeds to produce environmental benefits at project level and/or regular impact reporting. The reported metrics are aligned to market practice and Greenergy will use external assurance to review the reporting process.

Greenergy's reporting process score: **Transformative**

Assessment beyond GBPs

Alignment with UN Sustainable Development Goals (SDGs)

The SDGs adopted by all UN member states in 2015 are a collection of 17 global targets comprising an agenda for achieving sustainable development by 2030. We deem the following SDGs to be relevant for Greenergy's project categories:

Greenergy's Framework tied to six relevant UN SDGs

7. Affordable and clean energy: ensure access to affordable, reliable, sustainable, and modern energy for all.

8. Decent work and economic growth: promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

9. Industry, innovation, and infrastructure: build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

11. Sustainable cities and communities: make cities and human settlements inclusive, safe, resilient, and sustainable

12. Responsible consumption and production: ensure sustainable consumption and production patterns

13. Climate action: take urgent action to combat climate change and its impacts.

Appendix II lists the relevant indicators for assessing Greenergy's contribution to each SDG. The contribution to the SDGs can be quantified in post-issuance impact reporting. Greenergy did not provide specific indicators for measuring its contribution to each SDG, however we acknowledge that certain indicators from the allocation and impact reporting can be utilised for this purpose.

EU taxonomy alignment[2]

The project categories of Greenergy's framework pertain to the following eight taxonomy sectors for which the first delegate act on climate change mitigation specifies technical screening criteria:

- → 4.1 Electricity generation using solar photovoltaic technology
- → 4.3 Electricity generation from wind power
- → 4.8 Electricity generation from bioenergy
- → 4.10 Storage of electricity
- → 6.5 Transport by motorbikes, passenger cars and light commercial vehicles
- → 7.3 Installation, maintenance, and repair of energy efficiency equipment
- → 7.4 Installation, maintenance, and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)
- → 7.5 Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings
- → 7.6 Installation, maintenance, and repair of renewable energy technologies

Projects partially aligned with technical screening criteria

Greenergy's projects are mostly aligned with the **technical screening criteria** of the listed sustainable activities. For the electricity generation using solar PV technology, wind power, and the installation, maintenance, and repair of renewable energy technologies, Greenergy is aligned as the company plans to finance solar and wind energy projects in Hungary and contribute to the increase of renewable energy share in the country. For the electricity generation from bioenergy, Scope does not have sufficient information to assess Greenergy's project alignment of increase its biomass capacity to the correspondent technical screening criteria.

The energy efficiency project category is aligned with the technical screening criteria of the installation, maintenance, and repair of energy efficiency equipment as well as with the installation, maintenance, and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings. Greenergy intends to finance projects aimed at reducing energy consumption, such as enhancing heating and cooling networks, replacing conventional light sources with energy efficient alternatives, installing new energy-efficient windows, and replacing façades, among other activities. For the storage of electricity, Greenergy is aligned to the technical screening criteria as it aims to install two energy storage facilities for its solar and gas-engine power plants to promote the development of renewable energies.

The clean transportation category is aligned with the technical screening criteria of the installation, maintenance, and repair of charging stations for electric vehicles in buildings as Greenergy aims to install at least one charging station for EVs on its sites by 2025. For the transport by motorbikes,

[2]The EU taxonomy regulation was published in the Official Journal of the European Union on 22 June 2020 and entered into force on 12 July 2020. It establishes a basis for the EU taxonomy by setting out four overarching conditions that a particular economic activity must meet to qualify as environmentally sustainable. The taxonomy regulation establishes six environmental objectives: climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems.

passenger cars, and light commercial vehicles, Greenergy is aligned with the technical screening criteria as it plans to acquire EVs for its corporate fleet.

The EU taxonomy defines a '**do not significant harm**' (DNSH) assessment. The DNSH assessment ensures that the other environmental objectives are not harmed while a substantial contribution is made to one or more environmental objectives. Six sustainable economic activities have set DNSH criteria as to Greenergy is partially aligned with.

- → 4.1 Electricity generation using solar photovoltaic technology
- → 4.3 Electricity generation from wind power
- → 4.10 Storage of electricity

Project categories aligned with DNSH criteria

For the solar PV and wind power technologies, Greenergy chooses equipment for its renewable plants considering technical specifications such as a standard lifetime of 25-30 years, procurements cost, and expected cost of decommissioning at end-of-life of equipment. Greenergy has communicated to Scope that the green committee will monitor the waste management processes for storage technologies. We also note that Greenergy complies with EU and Hungarian regulations on waste management at end-of-life of equipment and components. In addition, all equipment used by Greenergy during construction will be dismantled and transported to waste management companies for its proper reuse and recycle activities.

- → 4.8 Electricity generation from bioenergy
- → 6.5 Transport by motorbikes, passenger cars and light commercial vehicles
- → 7.3 Installation, maintenance, and repair of energy efficiency equipment

Project categories not aligned with DNSH criteria

Regarding the electricity generation from bioenergy, the acquisition of EVs, and the installation of energy efficiency equipment, the issuer has not provided information to align to such DNSH criteria.

The EU taxonomy includes a **minimum social safeguards** assessment to ensure that entities carrying our environmentally sustainable activities, labelled as taxonomy-aligned, meet certain minimum governance standards and do not violate social norms, including human rights and labour rights. This means that activities considered taxonomy aligned will have to align with standards such as the OECD Guidelines for Multinational Enterprises, the UN Guiding Principles of Business and Human Rights, and the International Bill of Human Rights. Additionally, issuers should comply with the ILO's Declaration of the International Labour Organisation on Fundamental Rights and Principles at Work.

Issuer compliance with minimum social safeguards

Greenergy's projects financed by the issuance of green bonds will be fully placed in Hungary, where adherence to EU labour standards is compulsory. Greenergy follows KÉSZ's Code of Ethics which fully applies to all employees of the Group and includes topics such as discrimination, health and safety, conflict of interest, communication with customers and suppliers, policies on anti-corruption, and others.

Greenergy's alignment with EU taxonomy score: **Significant**

Our assessment: The EU taxonomy alignment scores two leaves as the issuance is partially aligned with the EU taxonomy, providing limited documents required to verify at least partial alignment with the technical screening criteria and the DNSH criteria of the mentioned economic activities. Greenergy is aligned with the minimum social safeguards.

Impact of proceeds

The energy transition is based on three main pillars: renewable energy, electrification of end use, and energy efficiency. To meet this transition, it will entail a shift in power generation from fossil fuels, where solar and wind power must increase substantially from 10% in 2022 to 63% by 2050,

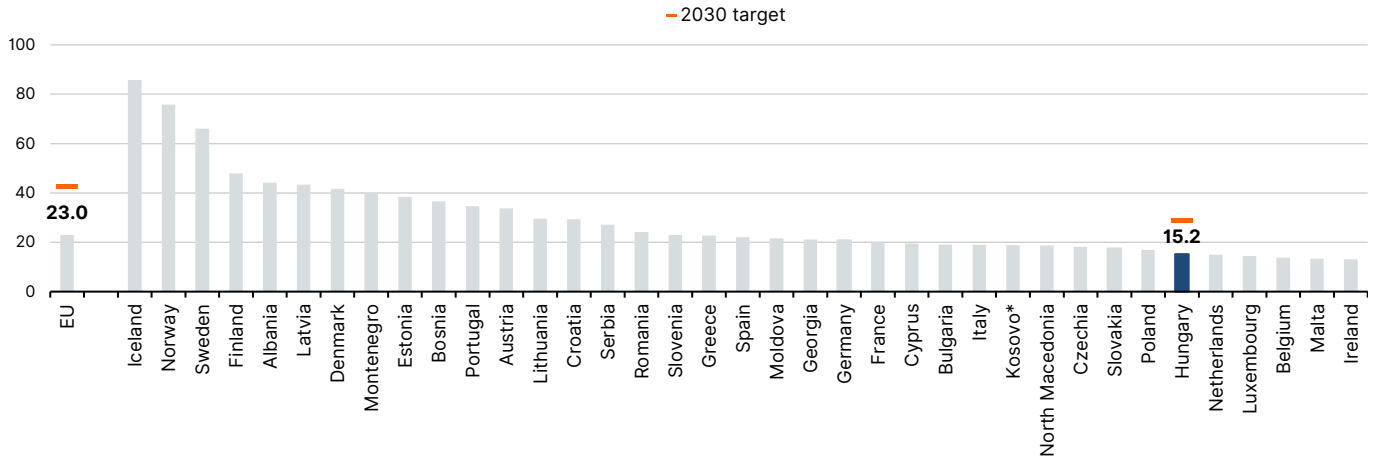
globally.[3] In addition, the end use sectors such as buildings, industry, and transport, will need to be electrified.[4] Greenergy's Framework refers to the main pillars for energy transition by financing solar and wind energy power plants, battery storage, improvement of energy efficiency in buildings, and financing clean transportation and supportive infrastructure.

I. Renewable energy

Updated renewable energy targets in the EU and Hungary

In 2023, the EU raised its binding renewable energy target to at least 42.5% by 2030, with the aim of reaching 45%[5]. Hungary's 2023 revised energy strategy also increased from 20%[6] to 29% in gross final consumption energy to be derived from renewables by 2030[7]. A significant growth in energy production and consumption volume drives the need for renewable energy sources to meet the demand and transition away from fossil fuels[8]. Hungary has gradually increased renewable energy output by about 1% a year, achieving a larger share remains a challenge (**Figure 4**). Hungary is among the six countries in the EU with the lowest share of renewable energy.

Figure 4: Share of energy from renewable sources, EU countries, 2022 (%)



Source: Renewable energy statistics, Eurostat[9]

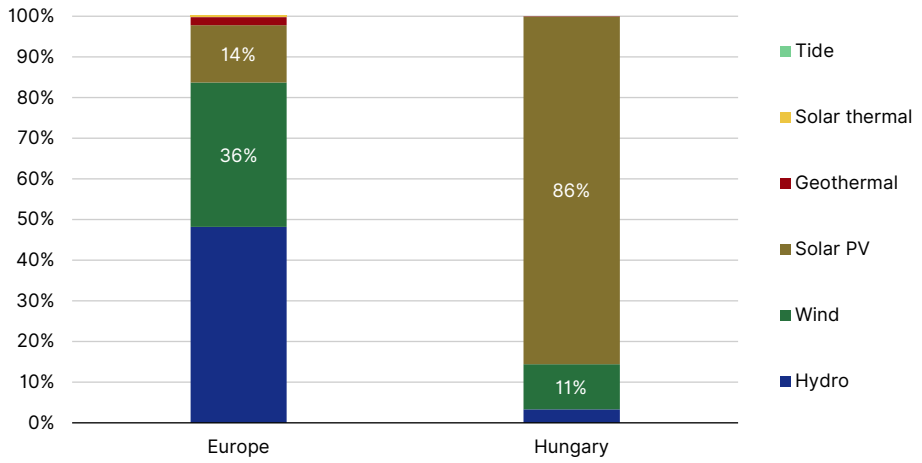
Solar, wind account for 97% of the renewable energy mix in Hungary

The EU attaches great importance to solar and wind power which accounted for 50% of the renewable energy mix in electricity generation in 2022 (**Figure 5**). In Hungary, solar and wind power represented 97% of the renewable energy mix and it is set to increase in coming years.

[3] The IRENA World Energy Transitions Outlook: 1.5°C Pathway
[4] https://www.irena.org/-/media/Irena/Files/Technical-papers/IRENA_Critical_Materials_2021.pdf?rev=e4a9bdcb93614c6c8087024270a2871d
[5] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en#the-revised-directive
[6] https://energy.ec.europa.eu/system/files/2019-06/necp_factsheet_hu_final_0.pdf
[7] https://commission.europa.eu/system/files/2023-09/HUNGARY%20-%20DRAFT%20UPDATED%20NECP%202021-2030%20_EN.pdf
[8] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413
[9] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics#Wind_and_water_provide_most_renewable_electricity.3B_solar_is_the_fastest-growing_energy_source

Figure 5: Share of renewable energy sources in electricity generation, 2022

Europe vs Hungary



Source: Short Assessment of Renewable Energy Sources (SHARES), Eurostat[10]

Increasing wind and solar power in the country could better balance the variability of weather-dependent energy generation, lowering the costs associated with balancing energy capacity and attaining self-sufficiency through renewable energy sources.[11] However, a major constraint of renewable energy such as solar and wind power is its limited capacity to replace fossil fuels as it is a volatile energy source until storage capacity technology becomes more advanced. The increased share of solar PV and wind power in Hungary's electricity generation is making the electricity system more decentralised. To secure integration of solar and wind shares into the electricity grid will require investing into grid infrastructure and storage, and flexibility solutions.[12] Greenergy's ambition to finance the installation of two energy storage facilities for its solar and gas engine power plants contributes to providing a more stable electricity supply.

Greenergy's projects will reduce energy-related GHG emissions

Greenergy plans to use 80% of the bond proceeds to finance the installation of solar and wind power energy plants in the region, and to add extra biomass capacity in its current power plants. Greenergy's ambitions promote the provision of renewable energies in the country by reducing energy related GHG emissions and mitigating the reliance on energy imports. Apart from the positive downstream impact from producing renewable energy, Greenergy's activity may also pose negative impact, which are summarised in the section below.

II. Energy efficiency

Even with the rapid increase of renewable electricity generation, energy efficiency can reduce the need of power generation capacity, making it one of the cleanest and most cost-efficient measures to address the security of energy supply.[13]

a. Battery storage

Energy storage is a key player on decarbonising the energy system

Energy storage plays a vital role in decarbonising the energy system, contributing to energy system integration and security of supply. To achieve EU's climate and energy targets, grid-scale storage, especially batteries, are crucial for effectively managing the impact of the increase in renewable energies on the power grid as well as for handling the intermittent nature of electricity generation caused by weather variations. Energy storage technologies can facilitate the electrification of different economic sectors, such as buildings and transport which are the largest

[10] https://ec.europa.eu/eurostat/web/energy/database/additional-data#Short%20assessment%20of%20renewable%20energy%20sources%20(SHARES)
[11] https://energiaklub.hu/files/study/Wind%20Energy_Wind%20and%20solar%20combined_Energiaklub%20EN.pdf
[12] International Energy Agency. (2022). *Hungary 2022 - Energy Policy Review*.
[13] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023L1791

emitters in the region. Batteries are the most scalable type of grid-scale storage technology and are projected to account for most of the storage growth worldwide.[14]

The dominant technology mix for grid-scale battery in 2022 continues to be lithium-ion, with the lithium iron phosphate batteries (LFP), a subset of lithium-ion batteries (LIB), emerging as the preferred choice for grid-scale storage. This preference is primarily due to their cost-effectiveness and energy density, allowing them to store a significant amount of power into a small place.

Greenergy plans to finance two energy storage facilities for its solar and gas engine power plants using LFP batteries and is also investigating the possibility of using redox (vanadium-oxide) or Na technologies as well in the future.

b. Buildings

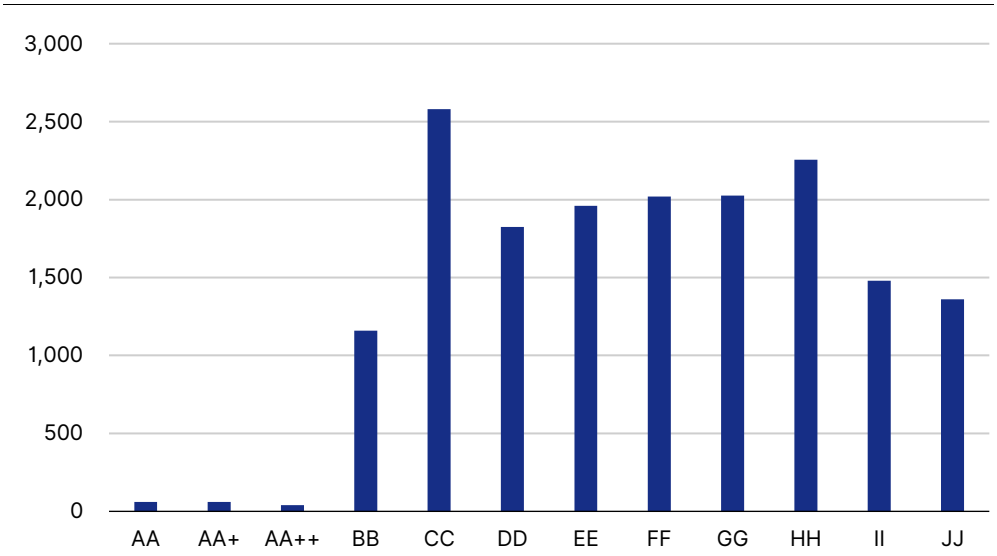
Buildings responsible for fifth of total GHG emissions in Hungary

Around 42% of primary energy use in Hungary comes from buildings and this sector is responsible for 20% of total GHG emissions in the country[15]. Hungary has established energy efficiency strategies aimed at achieving several targets: a 20% reduction in energy consumption from domestic residential buildings by 2030, a 60% decrease in CO_2 emissions related to building energy use by 2040 compared to the 2018-2020 average and ensuring that nearly zero-energy buildings constitute 90% of the building stock by 2050.[16] These objectives can be achieved through renovations of the existing building stock.

Currently, 75% of the EU building stock has a poor energy performance. As shown in **Figure 6**, around 40% of the offices in Hungary also have poor energy performance. Therefore, increasing the energy efficiency in this sector is crucial. The European Union promotes the refurbishment of buildings as part of its Renovation Wave initiative.

Greenergy will use 15% of the bond proceeds to renovate and/or acquire Hungarian buildings, specifically offices and sites, to improve the energy performance label and contribute to EU and Hungarian climate targets to reduce GHG emissions by 60% by 2040.

Figure 6: Distribution of energy certificates for office properties, Hungary 2021



Source: Commercial Real Estate Market Report, MNB, 2022[17]

[14] https://www.iea.org/energy-system/electricity/grid-scale-storage
[15] https://climate.ec.europa.eu/document/download/c1356247-beea-408b-b444-790a55065134_en?filename=hu_2023_factsheet_en.pdf&prefLang=fi
[16] https://energy.ec.europa.eu/system/files/2021-08/hu_2020_ltrs_en_0.pdf
[17] https://www.mnb.hu/letoltes/commercial-real-estate-market-report-april-2022.pdf

III. Clean transportation

Transportation is the largest source of CO_2 emissions in Hungary

In Hungary, transport is the largest source of CO_2 emissions accounting for 24.38%[18], of which two-thirds are produced by cars and vans. An EV is expected to reduce GHG emissions by 65% compared to a conventional petrol vehicle.[19]Therefore, the provision of charging infrastructure for EVs and hybrid is necessary in the transition to a cleaner transportation.

Greenergy plans to use 5% of the bond proceeds to finance the acquisition of EVs – full EVs or hybrid – to reach at least 20% of Greenergy's fleet by 2030. In addition, the proceeds will finance the installation of at least one charging station on its sites by 2025 using their own renewable energy source for the charging stations.

IV. Upstream impact

Chinese origin of renewable energy components dominates upstream impact

Clean energy technology supply chains are geographically concentrated. China is the world's largest producer of clean energy technologies such as solar PV panels and batteries, covering more than 80% of the market, and 65% for wind technologies. China's primary source of electricity generation is coal at more than 60%, therefore, clean energy technology components and equipment made in China are still predominantly supported by coal-fired power stations. Consequently, components such as Chinese-made PV systems have a global warming potential (GWP) 29% higher[20] (40% CO_2 emissions), on average, than those made in Europe. The emissions that result from the transportation from China to Europe account for around 3%, while the rest of the emissions are related to the energy required for manufacturing renewable energy equipment and components.[21]

Concerning battery storage, the escalating demand has led to a substantial increase in the need for critical minerals over recent years. These minerals, which are not readily accessible within the EU, are sourced from scarce resources. Meeting this demand means a significant increase in mining and refining activities. Currently, approximately, 60% of lithium refining capacity is in China[22].

The environmental footprint of existing LIB can vary a lot depending on the material, how they're sourced, and the energy source used in the manufacturing process. The GHG emissions from cradle-to-gate of the existing LIB range from 39 to 196kgCO_2eq/kWh, with the electricity use accounting for 40% of the overall lifecycle GHG emissions of LIB manufacturing.[23]

Greenergy has communicated to Scope that it procures most of the equipment related to renewable projects through Chinese suppliers (PV panels, inverters, energy storage system). For the operation and maintenance of renewable energy facilities, however, Greenergy prefers European countries. Greenergy's supply chain for renewable energy technology can vary depending on the available technology and the chosen supplier.

Greenergy's net environmental impact from renewable energy and energy storage projects remains positive

The main negative environmental impact of Greenergy's activity stems from its supply chain linked to China, given the country's heavy reliance on fossil fuels. At the same time, Greenergy's environmental net impact remains positive because it replaces fossil-fuel sources with solar parks and wind farms in the use phase (downstream impact). While the upstream impact from production and final degradation from using solar amounts 41-48gCO_2/kWh and wind 11gCO_2/kWh (depending on assumptions such as used materials per frame and transport), the lifecycle impact of coal (820gCO_2/kWh) or gas (490gCO_2/kWh) remains much higher.[24] Accordingly, the energy balance of solar and wind power relative to fossil-based electricity remains positive and the installation of two

[18] EEA greenhouse gases data viewer https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer
[19] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1062603/lifecycle-analysis-of-UK-road-vehicles.pdf
[20] Stamford, L., & Azapagic, A. (2018). Environmental impacts of photovoltaics: the effects of technological improvements and transfer of manufacturing from Europe to China. *Energy technology*, *6*(6), 1148-1160.
[21] https://www.pv-magazine.com/2021/09/24/frameless-glass-glass-solar-modules-made-in-europe-have-the-best-co2-footprint-fraunhofer-ise-says/
[22] https://www.iea.org/energy-system/electricity/grid-scale-storage
[23]Llamas-Orozco, et all. (2023). Estimating the environmental impacts of global lithium-ion battery supply chain: A temporal, geographical, and technological perspective. National Center for Biotechnology Information. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10683946/
[24] Kara, T.; Şahin, A.D. Implications of Climate Change on Wind Energy Potential. *Sustainability* 2023, *15*, 14822. https://doi.org/10.3390/su152014822

energy storage facilities using LFP batteries lessens renewable energy's volatile production and makes it more efficient in use.

V. Downstream impact

PV modules and wind turbines have a lifetime expectancy of at least 25 years. After this time, they can still produce more than 80% of their original power.

End-of-life PV and wind waste expected to increase considerably

Nevertheless, there is still the potential for an exponential increase in end-of-life waste from PV and wind turbines blades in the coming years. It is estimated that solar PV projects will generate around 200m tonnes[25] of waste by 2050, while wind blades will account for around 43m tonnes. Europe is expected to contribute 25% of the global waste generated.[26] However, the waste generated by solar and wind power is 99.6% less than the waste generated by coal ash and municipal waste. Therefore, transitioning from coal to low-carbon energy sources will lead to a significant reduction in waste.[27]

Regarding battery waste, battery recycling has the potential to be a significant source of secondary supply of the critical minerals, such as lithium, that are needed for future battery demand. LFP batteries have a higher GHG environmental benefit than other technologies in the recovery stage as the recycling process may require less energy compared to other battery chemistries. This can result in lower GHG emissions associated with the recycling process itself. In addition, LFP batteries generally contain fewer toxic materials, reducing the environmental and health risks associated with their recycling and disposal.[28]

Compliance with EU, Hungarian waste management policies

Greenergy communicated internally to Scope that it complies with EU and Hungarian regulations on waste management and the green committee will monitor the waste management processes including storage technologies. At end-of-life, all equipment used by Greenergy will be dismantled and transported to waste management companies specialized in the proper reuse and recycling of them, in accordance with waste management regulations.

Greenergy's impact of proceeds score: **Significant**

Our assessment: Greenergy's impact of proceeds has scored two leaves as the projects are aligned with specific environmental objectives outlined in the Framework, partly considering the value chain. The projects are aligned with relevant market standards and address material impacts within the relevant sectors and region of activity, however environmental benefits projections may lack details and clarity. Best practices are adopted by the issuer in executing the clean transportation activity by using its own renewable energy to run the charging stations.

Environmental and social risks

Greenergy complies with environmental Hungarian laws

While Greenergy will finance green projects with a positive impact, the eligible categories entail social and environmental risks. The most material risks relate to biodiversity, waste management, and health and safety.

Greenergy complies with Hungarian laws before project development to identify and assess risks associated with its activities. In addition, Greenergy requests its subcontractors to follow their environmental considerations on the operation and maintenance of the PV parks.

Greenergy's ES risks management score: **Significant**

Our assessment: Greenergy's risk management scores two leaves. Social and environmental risks are considered, and standards are required from suppliers. Whether risks are mitigated throughout all activities in the supply chain is not guaranteed to be monitored. In addition, we note Greenergy complies with Hungarian regulations which mitigates certain environmental and social risks related to the projects.

[25] https://www.irena.org/Energy-Transition/Policy/Circular-economy#:~:text=IRENA%20projects%20that%20waste%20from,than%20200%20Mt%20by%202050
[26] Liu, P., & Barlow, C. Y. (2017). Wind turbine blade waste in 2050. Waste Management, 62, 229-240
[27] Mirletz, H., Hieslmair, H., Ovaitt, S., Curtis, T. L., & Barnes, T. M. (2023). Unfounded concerns about photovoltaic module toxicity and waste are slowing decarbonization. Nature Physics
[28] Li, J., Li, L., Yang, R., & Jiao, J. (2023). Assessment of the lifecycle carbon emission and energy consumption of lithium-ion power batteries recycling: A systematic review and meta-analysis. Journal of Energy Storage

Associated project risks	Greenergy's risk mitigation measures
Biodiversity	Greenergy has informed Scope that it adheres to both EU and Hungarian regulations, which mandate approval from the environmental authority prior to the construction and installation of energy power plants. This permit is based on various criteria, including considerations such as protected areas, the impact of the power station on wildlife and factors and processes related to air protection, groundwater and underground water protection, waste management, noise and vibration, as well as wildlife protection, among others. Greenergy has confirmed that it does not operate on land that is at risk of biodiversity loss, such as natural areas designated as Natura 2000. Regarding the maintenance of solar energy plants, Greenergy states that they adhere to environmental criteria, including the avoidance of chemical usage. They also require their subcontractors to uphold these same standards.
Waste management	Poor waste management has led to the accumulation of waste in landfills, generating potent GHG like methane that contribute to climate change. Improper waste disposal has resulted in air and water pollution, affecting humans and wildlife. Waste arising from end-of-life clean energy infrastructure is projected to heavily increase over the next ten years to more than 200m tonnes[29] and 40m tonnes by 2050, on solar PV projects and wind power, respectively. Greenergy informed Scope that it complies with both EU and Hungarian regulations on waste management and the green committee will monitor the waste management processes including storage technologies. At end-of-life all equipment used by Greenergy will be dismantled and transported to waste management companies specialized in the proper reuse and recycle of them in line with waste management regulations.
Health and safety	Hungary's 1993 Occupational Safety and Health Act regulates health, safety, environmental and fire protection requirements in all workplaces.[30] EU-level regulations and minimum standards also apply in the country.[31] Greenergy addresses health and safety risks by following KÉSZ Group's occupational health and safety internal policies which comply with the provisions of Occupational Health and Safety-related legal regulations and requirements of the MSZ ISO 45001 Occupational Health and Safety Management System standard (OHSMS). However, we note that Greenergy is not part of the companies with OHSMS nor Sicherheits Certifikat Contraktoren (SCC) certification from the Group. An additional risk for health and safety stems from purchased renewable energy components and energy storage systems which may rely on forced labour in the regions where they were produced. No information was provided from Greenergy on the mitigation processes of such risk.

[29] https://www.irena.org/Energy-Transition/Policy/Circular-economy#:~:text=IRENA%20projects%20that%20waste%20from,than%20200%20Mt%20by%202050.
[30] https://www.ilo.org/dyn/natlex/docs/WEBTEXT/38155/64930/E93HUN01.htm
[31] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31989L0391&from=EN

Appendix I: Documents provided by Greenergy

Document category	Document description
Market research on sector/regional standards	National Energy and Climate Plan (Revised version 2023) – Hungary
	Energy balances EU and Hungary - Eurostat
	EU Waste Electrical and Electronic Equipment (WEEE) Framework Directive
	EU Directive 2023/2413 on the promotion of energy from renewable sources
	European Climate Law
	Special Report on Solar PV Global Supply Chain – International Energy Agency
	World Energy Outlook 2023, International Environmental Agency
General information provided by Greenergy	Expected electricity generated from the development of solar and plants
	KÉSZ Group's Code of Ethics
	KÉSZ Group's Sustainability Reports with internal policies
	Factory energy audit
	Climate resilience assessment analysis
Green bond-specific documentation provided by Greenergy	Green Bond Framework
	Information on use of proceeds

Appendix II: SDG alignment

GBP category	SDG alignment	Indicators to be evaluated
Renewable energy		→ Renewable capacity additions annually → Total renewables capacity → Avoided GHG emissions in tonnes of CO_2eq
Energy efficiency		→ Annual greenhouse gas emissions reduction in tonnes of CO_2eq → Amount of stored energy → Renewable share of stored energy → Annual reduction of energy consumption in percentage or in MWh compared to conventional technology
Clean transportation		→ Number of EV charging stations → Percentage of EV in Greenergy's fleet → Percentage of energy use reduced vs the current fleet relative to 2022 → Annual CO_2 emissions reduction

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Applied methodologies

Applied Green Bond Principles, ICMA, 2022
Applied Green Bond's SPO Guidelines, December 2022

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