



Glitre Energi

Green Bond Second Opinion

September 4th, 2020

Glitre Energi is a Norwegian group of companies which produces and distributes electricity generated by run-of-river hydropower plants. With an annual production of up to 2,5 TWh, Glitre Energi secures about 2% of Norway's power demand.

The green finance framework lists projects within renewable energy and energy efficiency categories. Glitre Energi plans to invest 50% of proceeds in renovation of existing hydropower plants under renewable energy category and 50% of proceeds in upgrading the electricity distribution network, under energy efficiency category. Other projects, such as energy storage, energy recovery and smart grids may be financed under this framework with less than 1% of the proceeds.

Glitre Energi has a strategic goal to invest exclusively in renewable energy and enabling technologies as part of the Norwegian "green shift" but has no quantitative emission reduction targets. Renewable energy projects have a positive impact on the environment. Nevertheless, emissions can be associated with large water reservoirs and construction or renovation projects, due to the use of emission-intensive construction materials (e.g. cement). CICERO Shades of Green encourages Glitre Energi to systematically measure, report and manage its impact on biodiversity loss, emissions from its water reservoirs and supply chain of construction and other materials, that are not currently accounted for.

Based on the overall assessment of the projects that will be financed under this framework, and governance and transparency considerations, Glitre Energi's green finance framework receives a **CICERO Dark Green** shading and a governance score of **Excellent**.

SHADES OF GREEN

Based on our review, we rate the Glitre Energi's green finance framework **CICERO Dark Green**.

Included in the overall shading is an assessment of the governance structure of the green bond framework. CICERO Shades of Green finds the governance procedures in Glitre Energi's framework to be **Excellent**.



GREEN BOND PRINCIPLES

Based on this review, this Framework is found in alignment with the principles.





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1 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the client's framework dated September 2020. This second opinion remains relevant to all green bonds and/or loans issued under this framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Green encourages the client to make this second opinion publicly available. If any part of the second opinion is quoted, the full report must be made available.

The second opinion is based on a review of the framework and documentation of the client's policies and processes, as well as information gathered during meetings, teleconferences and email correspondence.

Expressing concerns with 'shades of green'

CICERO Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

CICERO Shades of Green



Dark green is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.



Medium green is allocated to projects and solutions that represent steps towards the long-term vision but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition risks might be considered.



Light green is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil-fuel elements. Projects may be exposed to physical and transitional risk without appropriate strategies in place to protect them.



Brown is allocated to projects and solutions that are in opposition to the long-term vision of a low carbon and climate resilient future.

Examples



Wind energy projects with a strong governance structure that integrates environmental concerns



Bridging technologies such as plug-in hybrid buses



Efficiency investments for fossil fuel technology where clean alternatives are not available



New infrastructure for coal

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, the governance aspects are carefully considered and reflected in the overall shading of the green finance framework. CICERO Green considers four factors in its review of the client's governance processes: 1) the policies and goals of relevance to the green finance framework; 2) the selection process used to identify and approve eligible projects under the framework, 3) the management of proceeds and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent.



2 Brief description of Glitre Energi's green finance framework and related policies

Glitre Energi is a Norwegian utility group which owns, develops and operates hydropower plants and affiliated infrastructure. The group produces and sells hydropower in Norway, covering 2% of the county's electricity demand. The annual production of the group falls between 2,3 TWh and 2,5 TWh from their twelve wholly owned power plants and operatorship of other nine partly or indirectly owned plants. This makes Glitre Energi the ninth largest energy producer in Norway. Over 1TWh of production is sold through retail from the group's transmission and distribution network of over 8,000 km.

The group also owns grid assets with around 100,000 customers, sells (retail) power to over 50,000 end-users and has strategic ownership within fiber optical infrastructure, in the district heating sector, wind and small-scale hydropower projects and electrical infrastructure. According to the issuer, strategic ownership accounted for 11% of pre-tax profit in 2019, with the largest contributors being Viken Fiber (5%) and Drammen Fjernvarme (2%). The group has a 50%, non-controlling interest in Drammen Fjernvarme, district heating distributor in Drammen. Annual sales from Drammen Fjernvarme (100%-basis) are around 94 GWh. This ownership is not part of the consolidated group structure and is being financed and operated independently of Glitre Energi Group. The Green Financing Framework will not be used to finance any district heating activities.

Environmental Strategies and Policies

Glitre Energi's main activity is production and distribution of renewable energy in the form of hydropower. As such, the group's overall emissions are low relative to similar sized utility companies. The main sources of emissions are transportation and network installation losses. According to the issuer's annual report, total emissions have dropped from 4,129 tons CO₂eq in 2017 to 3,787 tons CO₂eq in 2018. These emissions account for reduction in transmission losses, from 240 GWh in 2017 to 212 GWh in 2018. Emissions from losses in the distribution network are estimated at 16g CO₂eq/kWh, based on NVEs production declaration on Norwegian hydropower production. The issuer has systematically worked with upgrading and capacity increase of existing powerplants. Since 1995 we have increased annual production with approximately 20% (additional production of 475 GWh / year) by upgrading powerplants within existing licenses.

Glitre Energi reports on emissions from own activities: energy used in own buildings, fuel for own vehicles and grid losses, but the scope of reporting is expected to increase from 2020 onwards. Emission reporting currently follows Glitre Energi's internal guidelines and does not include emissions from dams or emissions from refurbishing of power plants. Glitre Energi are currently developing a sustainability and environmental policy and related strategies. During Q4 2020, Glitre Energi will be conducting analysis to find the most significant contributors to the group's environmental footprint. A carbon emission accounting system will be set up to include supply chain emissions (scope 3). Emissions from refurbishing and upgrading of hydro power plants (material usage, transportation, construction and waste handling) will be considered as a part of this work. So far, the company has implemented separate strategies for each refurbishment project.

The issuer has recently increased their environmental competence by recruiting a new employee to be responsible for sustainability and environmental issues, who's responsibilities will include reporting in line with international frameworks such as GRI, GHG protocol, UN Global Compact standards or TCFD recommendations. Environmental lifecycle analysis is conducted for larger projects, such as the Embretsfoss IV, a 304 GWh



hydropower plant, operating since 2013. Emissions related to this project have been evaluated by an independent third party.

The group sees itself as a driver of change in the energy sector and a contributor to a low carbon future and considers that all borrowing, including but not limited to green bonds should support Glitre Energi's profile as an environmental and social responsible company. The issuer plans to contribute to the green transition through developing a more efficient grid to support increasing demand for electricity. This will be achieved through continuous refurbishment of existing hydropower plants to increase renewable energy output and support relevant policies.

Use of proceeds

CICERO Green finds Glitre Energi's green finance framework to be in line with the Green Bond Principles (GBP). Proceeds from Glitre Energi green bonds will be exclusively allocated to renewable energy (50%) and energy efficiency (50%) categories. Eligible projects under the issuer's green finance framework refers to a selected pool of Norwegian projects that will be funded in whole or in part by Glitre Energi and/or its subsidiaries. Proceeds can be allocated to new projects, upgrade of existing eligible projects or refinancing of existing projects. The issuer expects most proceeds allocated for hydropower projects to be used on refinancing of existing projects and for grid investments a 50/50 split is expected between new investments and refurbishments and upgrades. Eligible projects must promote the transition to a low carbon future and climate resilient growth.

Glitre Energi explicitly excludes nuclear and fossil energy generation projects from their green finance framework, including indirect investments in fossil fuel related infrastructure, such as district heating infrastructure.

Selection:

The selection process is a key governance factor to consider in CICERO Green's assessment. CICERO Green typically looks at how climate and environmental considerations are considered when evaluating whether projects can qualify for green finance funding. The broader the project categories, the more importance CICERO Green places on the governance process.

Projects fulfilling the eligibility criteria will be evaluated, selected and approved in consensus by a committee. Assessment of project fit with eligibility criteria is done internally. The committee includes Glitre Energi's treasury department and relevant business units, including participation of relevant environmental specialists within the organization. According to the issuer, the committee includes at least one member from the treasury department, two or three sustainability experts and someone with technical competence. The environmental experts have veto rights.

Management of proceeds

CICERO Green finds the management of proceeds of Glitre Energi to be in accordance with the Green Bond Principles. Glitre Energi will register and monitor projects covered by the green bond proceeds. In case proceeds exceed the pool of eligible projects, the excess liquidity will be managed in accordance with the issuer's liquidity managements policy. The excess liquidity will be part of the issuer's cash pool, deposited in a Norwegian bank.

Reporting

Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs. Procedures for reporting and disclosure of green finance investments are also vital to



build confidence that green finance is contributing towards a sustainable and climate-friendly future, both among investors and in society.

The responsibility for selection and reporting from projects rests with Glitre Energi until the project is completed. To provide transparency and insight into project progress, the issuer will produce an annual investor report. The investor report will be drafted by the Finance and accounting department, with assistance from environmental specialists and issued shortly after the corporate annual report and no later than June 30th, every year. The investor report will include a list of financed projects in case of hydropower projects and portfolio-based reporting in case of grid assets, including amounts allocated, a brief description of the project and portfolio, expected environmental impacts as well as information about the division of allocation between new projects and refinancing. Furthermore, it is Glitre Energi's ambition to report on the expected amount of renewable energy added, restored, connected and distributed for renewable projects and on the expected efficiency gains achieved for the same output or service in energy efficiency projects when feasible. Impact metrics for the renewable energy category are: new annual renewable energy generated (GWh) and CO₂ avoided (GWh x combined margin). Impact metrics for the energy efficiency category are: annual renewable energy generation (GWh), reduction of renewable energy transmitted (%) and CO₂ reduction (GWh x combined margin). The investor report will be verified by Glitre Energi's internal compliance and quality process.

The investor report, the opinion of the internal compliance function and the outstanding second party opinion (SPO) will be publicly available on the issuer's [website](#).



3 Assessment of Glitre Energi's green finance framework and policies

The framework and procedures for Glitre Energi's green finance investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon projects; weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where Glitre Energi should be aware of potential macro-level impacts of investment projects.

Overall shading

Based on the project category shadings detailed below, and consideration of environmental ambitions and governance structure reflected in Glitre Energi's green finance framework, we rate the framework **CICERO Dark Green**.

Eligible projects under the Glitre Energi's green finance framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide investors with certainty that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the "overall environmental profile" of a project should be assessed and that the selection process should be "well defined".

| Category | Eligible project types | Green Shading and some concerns |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Renewable energy  | <ul style="list-style-type: none">HydropowerHydropower related infrastructure (i.e. transmission network) | Dark Green <ul style="list-style-type: none">✓ While renewable energy is generally low-carbon, local environmental impacts such as on biodiversity and landscape, and lifecycle emissions from construction and operation are concerns for these projects.✓ The issuer plans to upgrade and refurbish existing hydropower plants with the purpose of increasing capacity.✓ Capacity increases are very plant-specific and depend on existing arrangement and hydrological conditions. Generally, refurbishment projects are expected to increase power production by 5 to 10%. |



- ✓ Lifecycle emissions from upgrading of existing hydropower plants can be significant, due to use of traditional construction materials, such as cement.
- ✓ Global cement production generates 5 to 6 % of annual anthropogenic CO₂ emissions. Use of alternative construction materials is recommended.

Energy efficiency



- Construction and reconstruction of transmission- and distribution network to connect new renewable energy to the grid
- Upgrading of transmission- and distribution network to decrease losses and/or enhance transmission capacity for renewable energy
- Energy storage
- Energy recovery
- Smart grids

Dark Green

- ✓ Through efficiency improvements in the distribution network, the issuer expects a decrease in the grid factor in the medium term.
- ✓ Examples of smart grids are advanced metering system (AMS). All Norwegian electricity consumers have been provided with AMS as of January 1st, 2019¹.
- ✓ Energy storage and energy recovery projects could be included in this framework in the future.
- ✓ Energy storage projects can involve the use of lithium-ion batteries. Mining of lithium and other ingredients used in batteries (e.g. cobalt and nickel) can have severe environmental impacts due to the high toxicity and water-intense processes that are undergone in the industry.

Table 1. Eligible project categories

Background

Global electricity demand increased 4% in 2018, with low-carbon generation expanding 6% to meet a considerable share of this growth. Nevertheless, power sector CO₂ emissions rose by 2.5%, with coal responsible for 80% of this increase. In 2018, 42% of all energy-related CO₂ emissions came from the power sector, causing it to remain the largest source of energy-related CO₂ emissions. Investments in the rapid transition to renewable energy powered economies are therefore increasingly critical.

Despite these positive trends in the expansion of renewable electricity generation, additional efforts are needed in renewable power generation to meet the targets set out in the IEA’s SDS. According to the IEA, the share of renewables in global electricity generation must reach 47% by 2030, up from 25% in 2017.² The IEA’ Sustainable

¹ <https://www.nve.no/norwegian-energy-regulatory-authority/retail-market/smart-metering-ams/>

² <http://ww.iaea.org/tcep/power/renewables>



Development Scenario (SDS) suggests a global wind power generation of 14,100TWh in 2040 up from 1,500TWh in 2017.³

Norway has the lowest emissions from the power sector in Europe, with a total installed renewable power of 35.3GW installed capacity and 147TWh produced in 2018.⁴ Hydropower contributed 95% of the total electricity production in 2018 and 92% of total installed capacity. 4.8% of Norwegian production capacity is contributed by wind and 3.1% by thermal power (e.g., waste incineration or gas power). The main electricity consumers in Norway are the mining and manufacturing industry (44.9%), other services (21.3%) and private households and agriculture (33.9%).⁴

EU taxonomy

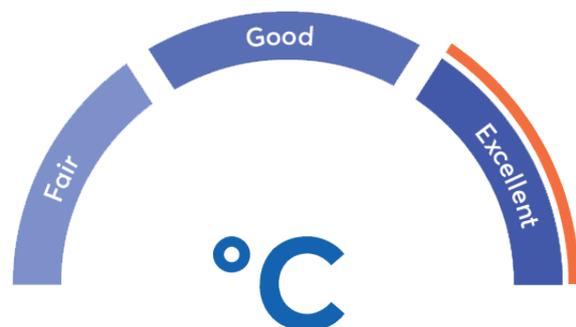
The EU Taxonomy has criteria for most energy generation technologies and the focus is on supporting the development of renewable energy with emissions below 100g CO₂e / kWh. Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the allocated life cycle impacts for producing 1 kWh of electricity are below the declining threshold. Hydropower facilities operating at life cycle emissions lower than 100gCO₂eq/kWh, declining to 0gCO₂eq/kWh by 2050 are eligible. This threshold will be reduced every five years in line with a net-zero CO₂eq in 2050 trajectory. For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions. Hydropower facilities with a power density above 5 W/m² are currently derogated from conducting the PCF or GHG Lifecycle Assessment (subject to regular review in accordance with the declining threshold). The issuer has calculated power density for the purpose of this second party opinion, for one hydropower plant. The installed capacity at Embretsfoss 4 is 51,5 MW and the surface area of the reservoir is 0,125 km², which results in a power density (facility capacity / reservoir surface area)⁵ of 410 W/m².

Governance Assessment

Four aspects are studied when assessing the Glitre Energi's governance procedures: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these aspects, an overall grading is given on governance strength falling into one of three classes: Fair, Good or Excellent.

Glitre Energi has in place a sound management and governance structure, as well as transparent selection process and reporting of own activities and green bond projects and achievements. The issuer has a strategic goal of growth based entirely on renewable energy technologies, by harnessing and distributing energy locally and investing in energy efficiency through reduction of losses.

Although Glitre Energi does not currently report according to TCFD, the issuer has recently recruited a sustainability expert who will be responsible for developing the group's emissions counting method to include Scope 2 and 3 emissions and report according to international frameworks such as the UN Global Compact and TCFD, starting in 2021. In addition, Glitre Energi has in place a sound selection process that involves two to three sustainability



³ <https://www.iea.org/weo2018/scenarios/>

⁴ <https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>

⁵ <https://www.climatebonds.net/files/files/Hydropower%20Criteria%20Background%20Paper.pdf>



experts and is based on consensus. The overall assessment of Glitre Energi's governance structure and processes gives it a rating of **Excellent**.

Strengths

It is a clear strength that Glitre Energi's framework focuses exclusively on low-carbon solutions, i.e. local production and distribution of renewable energy from run-of-river hydropower plants. Furthermore, the issuer specifically excludes investments in fossil-based technologies and the framework is supported by a sound governance structure. The issuer is aware of climate related risks to its assets. The group regularly conducts, updates, and operationally mitigates flooding-related risks in the river systems where operational hydropower plants are located.

Glitre Energi is a small player compared to other hydropower producers in Norway. Nevertheless, it has increased its focus on sustainability by recruiting a new sustainability expert who will be responsible for the development of an improved emissions counting, to include Scope 2 and 3 emissions and reporting in line with international frameworks, such as the UN Global Compact and TCFD recommendations.

It is also a strength that Glitre Energi's framework includes builds upon previous successful energy efficiency projects to reduce distribution losses, from 240 GWh in 2017 to 212 GWh in 2018.

Weaknesses

We find no material weaknesses in Glitre Energi's green finance framework.

Pitfalls

While renewable energy projects generally are considered to have a very positive climate impact, there are nevertheless large emissions associated with the construction process. 50% of proceeds under this framework are expected to be invested in renovation and upgrading of existing hydropower plants, using traditional construction materials, such as cement. The issuer includes environmental and lifecycle costs in their procurement policy, there is no strategy to support systematic reduction of emissions from renovation projects.

Glitre Energi's green finance framework may include energy storage projects, that are not clearly defined yet. This could materialize as a pitfall if battery banks are installed. Mining and production of battery components like minerals (e.g. lithium) and metals (e.g. cobalt, nickel) have significant negative impacts on the environment. Apart from being environmentally invasive and scarring the landscape, lithium extraction is water intensive, while the world's larger lithium reservoirs are located in dry regions of South America (e.g. Bolivia, Argentina and Chile). Furthermore, cobalt mining can have severe environmental, social and health implications, due to its radioactive properties, accumulation within food chains and unique geographical abundance in one country, the Democratic Republic of Congo. CICERO Shades of Green encourages Glitre Energi to consider alternatives to batteries for their energy storage projects⁶.

Large water reservoirs projects may also materialize as a pitfall, even in run-of-river hydropower plants. The presence of submerged moving apparatus, such as turbines has negative impacts on fish and other riverine biota. The indirect effects on biogeochemical cycling are also important to consider. Elevated GHG emissions from young (less than 10 years) reservoirs are commonly observed but some reservoirs may continue to generate high

⁶ <https://www.sciencedirect.com/science/article/pii/S2300396018301836>



levels of GHG emissions at least 20 years after flooding. CICERO Shades of Green encourages Glitre Energi to systematically measure, report and manage emissions that are associated with existing water reservoirs.



Appendix 1: Referenced Documents List

| Document Number | Document Name | Description |
|-----------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Glitre Energi's Green Bond Framework | Framework dated 2020 |
| 2 | Glitre Energi's Ethics and Social Responsibility | Report dated December 2019 |
| 3 | Glitre Energi's Annual Report | Latest report, issued for 2018 |
| 4 | Glitre Energi's Purchase Policy | Most recently revised in December, 2019 |
| 5 | Glitre Energi's Environmental Health and Safety Policy | Most recently revised in December, 2019 |
| 6 | Glitre Energi's Finance and Risk Management Policy | Most recently revised in December, 2019 |
| 7 | Glitre Energi's presentation to investors | January 2020 |
| 8 | Glitre Energi's ISO 14025/2006 Certification of Embretsfoss IV (E4) plant | Expired in 2018 |
| 9 | Glitre Energi's Network Losses and Economical Evaluation of Upgrades | Conducted in June, 2011 |
| 10 | Glitre Energi's Environmental Strategy for Energy Production | The document outlines the summary of Glitre Energi's environmental policies and targets as well as relevant regulations. |
| 11 | Glitre Energi's Construction License | Valid until November 2039, the document is proof that Glitre Energi has permission to build and maintain power lines in Buskerud, for Øvre Eiker and Modum municipalities. |



Appendix 2: About CICERO Shades of Green

CICERO Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD).

