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Powered by Shades of Green

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Second Party Opinion

Østfold Energi Green Finance Framework

Aligned = 🗸

June 20, 2025

Strengths

net zero future.

Location: Norway

Sector: Utilities (generation)

Conceptually aligned = **O**

Not aligned = 🗙



Primary contact Anna Liubachyna

@spglobal.com

London +442071760494 Anna.liubachyna

Activities that correspond to the long-term vision of a low-carbon climate resilient future.

Our <u>Shades of Green</u> Analytical Approach >

Alignment Summary

✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)

✓ Green Loan Principles, LMA/LSTA/APLMA, 2025

See Alignment Assessment for more detail.

Østfold Energi 's investments enable the

generation assets. Solar and wind power and

hydropower will all play a role in achieving a

rollout of additional renewable energy

Weaknesses

No weaknesses to report.

Areas to watch

The issuer's waste incineration plants expose the company to significant carbon emissions and air pollution. Although waste incineration plant financing is not included in the framework, such plants are nonetheless associated with negative environmental impacts. Planned investments in carbon capture could reduce this exposure via carbon dioxide removal.

Østfold Energi is developing its approach to reducing scope 3 emissions. The company calculates scope 3 emissions intensities and is aiming to become carbon neutral by 2035. That said, it is still developing its approach to systematically reducing this exposure, especially from purchased goods and services and investments in assets. The issuer has started to explore the use of low carbon materials and electrical equipment in its hydropower plants.

Shades of Green Projects Assessment Summary

Over the three years following issuance of the financing, Østfold Energi expects to allocate 90% of proceeds to renewable energy and, linked to it, terrestrial and aquatic biodiversity conservation, 5% to district heating and cooling, and 5% to pollution prevention and control.

The issuer expects 70% of proceeds to be allocated to refinancing projects, while 30% of proceeds will be directed to finance new projects.

Based on the project categories' Shades of Green detailed below, the expected allocation of proceeds, and considering the environmental ambitions reflected in Østfold Energi's Green Financing Framework, we assess the framework as Dark green.

Renewable energy

Dark green

Development, construction, installation, operation, improvement, repair, and maintenance of facilities and infrastructure for the generation of electricity from wind power, solar power, and hydro power



Protection, preservation and restoration of marine and watershed environments and natural landscapes of the rivers supplying water to hydropower facilities

See Analysis Of Eligible Projects for more detail.

Issuer Sustainability Context

This section provides an analysis of the issuer's sustainability management and the embeddedness of the financing framework within its overall strategy.

Company Description

Headquartered in Sarpsborg, Norway, Østfold Energi AS provides renewable electricity and district heating services. As of 2024, around 95% of its sales and 96% of its generated power are from its 11 wholly and partly owned hydropower plants in Lærdal, Årdal, Marker, Halden, and Sørfold. The rest of its production comes from district heating, wind, and solar plants. It owns and operates six district heating and cooling networks that produce around 60 gigawatt hours (GWh) annually from waste heat, wood chips, heat pumps, and its waste-to-energy facility in Rakkestad. It has developed its wind operations in partnership with Kvalheim Kraft DA and Zephyr and its solar projects with Solgrid and Soleie. With 64 employees, it is owned by the municipalities of Østfold and Aurskog-Høland (55%) and Østfold county municipality (45%).

Material Sustainability Factors

Climate transition risk

Power generation is the largest direct source of greenhouse gas emissions globally, making this sector highly susceptible to the growing public, political, legal, and regulatory pressure to accelerate climate goals. Public awareness of the urgency for climate action has reached a turning point. In turn, policymakers and regulators now more often push for a faster transition to lower-carbon energy, especially as these technologies become more mature and cost competitive. Over the past decade, we have seen multibillion-dollar impairments for most polluting assets, reflecting their weaker economics as taxes increase and they are displaced by new, cleaner technologies. In addition, more stringent decarbonization rules may sometimes restrict their license to operate. The number of countries announcing pledges to achieve net zero emissions over the coming decades continues to grow. With no direct emissions, renewable energy technologies have a vital role to play in reducing emissions associated with power and heat, which will be vital for limiting the global temperature rise to 1.5C.

Physical climate risk

As fixed assets, generators are exposed to physical climate risks. For stakeholders, extreme weather events, including wildfires, hurricanes, and storms, are becoming more frequent and severe and can result in power outages for large populations of users. As water is often a significant resource for hydro, nuclear, and fossil-fuel based power plants, exposure to flooding, drought, or warmer temperatures can also negatively impact operations. In turn, these dynamics, coupled with regulatory pressure to preserve security of supply, are driving players to enhance the resilience of assets. Physical climate risks generally involve significant financial losses for operators due to costly repairs, but more importantly from exposure to extreme power price spikes or claims due to business disruption. We expect these dynamics to continue but vary regionally depending on regulatory responses.

Biodiversity and resource use

Renewable power generation requires large areas of land that often encompass sensitive habitats, where it can alter ecosystems, harm threatened species and compete with other valuable land uses (such as agriculture). This is especially pertinent for hydropower plants, which, if not properly managed, may pose biodiversity risks such as habitat disruption, modified water flow, and hindrances to fish migration. In most jurisdictions, local regulations mandate that new projects undergo environmental impact assessments (EIAs) to identify biodiversity risks and take steps to avoid or minimize potential harm. In Norway, this is coordinated by the Water Resources and Energy Directorate and governed by the Ministry of Energy. All energy and water projects are required to submit a license application and plants that are larger than 40 GWh are required to undertake consequence analysis of their environmental and social impacts.

Pollution

Under applicable environmental laws and regulations, entities in the waste management value chain could be liable if their operations cause environmental damage, particularly air, water, or soil contamination. In Norway, pollution is heavily regulated, for example by the Pollution Control Act of 1981, which includes provisions on emissions into the air and water, and soil contamination, as well as waste management.

Impact on communities

Sites with high renewable energy potential are often in or near communities, which can prompt strong local opposition, including in cases of shared resources such as water. In Norway, stakeholder engagement is required as part of the license application process.

Issuer And Context Analysis

All project categories in the framework aim to address sustainability factors that we consider to be material for Østfold Energi. The issuer's investments in renewable energy, district heating and cooling, and pollution prevention and control will seek to address its climate transition, and physical climate and pollution risks, which we consider highly material for power generators and utility networks. Projects related to terrestrial and aquatic biodiversity conservation may also reduce the biodiversity and resource use impacts related to its large-scale hydropower plants.

While Østfold Energi's activities support the Norwegian energy sector's transition to renewable sources, its strategy to reduce scope 3 emissions is still nascent. In 2024 scope 3 emissions accounted for 66% of the company's total carbon footprint, with scope 1 contributing 27%, and scope 2 roughly 7%. It aims to reduce its scope 1 and 2 emissions by 67% by 2027 and become climate neutral by 2030. A key measure to reduce its direct emissions will be its investment, under this framework, in carbon capture and utilization (CCU) technology through its company Carbon Centric. This will apply to its waste-to-energy (WtE) Rakkestad facility, which generates around 21% of its total emissions and will contribute to its ambition to become carbon neutral by 2035. It is working to diversify and expand its portfolio of renewables with a focus on hydropower. It is also exploring innovative feedstocks such as green hydrogen (through its part ownership of Viken Hydrogen) and small modular nuclear reactors via its participation in Halden Kjernekraft. Østfold Energi calculates its scope 3 emissions intensities using the GHG Protocol and carbon accounting software Kilimakost. That said, it is still developing its approach to reducing this exposure systematically, particularly from the largest sources, namely purchased goods and services and assets. We view positively that in 2023 it started to explore lower carbon solutions for its hydropower assets with two pilot projects involving the use of low carbon concrete and electric tunnel-boring machines. It has yet to disclose the results of these projects.

Østfold Energi has assessed the risks and opportunities related to physical climate risk. This was part of its first climate assessment in 2023 using a time horizon of 2100. It identified flooding and extreme rainfall as its most material risks, as well as its hydropower plants' impact on ice formation given variations in freezing temperatures and reduced access to biomass resulting from increased demand. Though it has yet to implement adaptation measures in its plants, we view as positive that the framework includes repair and maintenance activities as this may contribute to improving their resilience.

Østfold Energi is subject to stringent regulations related to mitigating its impact on biodiversity, pollution, and local communities. To comply with these requirements, the company finances a salmon and trout hatchery, releases sea trout into its reservoirs, and in 2021 started to restore five tributaries to the Lærdal river. In addition, it is developing an accounting system to determine the impact of its operations on nature and aid in the selection of sites for new plants. That said, we note that in 2024 the company was fined by the Norwegian Water Resources and Energy Directorate due to a rapid decline in water levels caused by the failure of

Second Party Opinion: Østfold Energi Green Finance Framework

one of its generators. After an investigation by an external party, the company implemented a review of its operating procedures at the unit in question and updated its management systems.

Alignment Assessment

This section provides an analysis of the framework's alignment to Green Bond/Loan principles.

Alignment Summary

Aligned =
Conceptually aligned =
Not aligned =
X

- ✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)
- ✓ Green Loan Principles, LMA/LSTA/APLMA, 2025

✓ Use of proceeds

We assess all the framework's green project categories as having a green shade, and the issuer commits to allocating the net proceeds issued under the framework exclusively to finance or refinance eligible green projects. Please refer to the Analysis Of Eligible Projects section for more information on our analysis of the environmental benefits of the expected use of proceeds. Eligible projects include facilities and infrastructure for the generation of electricity from solar, wind, and hydropower; district heating and cooling; pollution prevention and control via the capture of carbon; and the conservation of terrestrial and aquatic biodiversity.

✓ Process for project evaluation and selection

Østfold Energi's internal investment committee will be responsible for the selection of eligible projects, which it will track using a registry of green projects. Each potential investment will be assessed for its alignment with the company's strategic and economic targets; contribution to the reduction of environmental and social impacts; risk level; commitments; and degree of priority relative to other opportunities. The framework excludes the financing of activities linked to fossil-fuel energy generation, weapons and defence, potentially environmentally negative resource extraction, pornography, gambling or tobacco, and waste incineration facilities primarily fuelled by residues from households and/or commercial activities.

✓ Management of proceeds

Østfold Energi's Investment Committee commits to tracking the allocation of proceeds and, if applicable, the green tranches of loan facilities, using a register of green projects. It will also ensure that the value of financed green projects exceeds the total nominal amount of bonds or loans outstanding. If a financed project is sold or it no longer meets the framework criteria, it will be replaced by an eligible one. Unallocated proceeds will be held as cash and short-term money market instruments. To the extent possible, the company will apply the framework's exclusion list to such proceeds.

✓ Reporting

Østfold Energi commits to disclose its allocation of proceeds and their impacts in a Green Finance Report that it will publish annually on its website while there are green bonds or loans outstanding or until full allocation. The allocation report will include breakdowns of the proceeds invested in each green project category, new financing and refinancing, and capital and operating expenditure and a description of the projects. It will also include the green projects funded by green bonds and loans, the nominal amount of green bonds and loans outstanding, and the amount of unallocated proceeds. The impact report will aim to provide transparency on the environmental impacts of financed projects on an aggregate basis for each category and subject to data availability. We view as positive that the company will seek to align its impact reporting with ICMA's Handbook – Harmonized Framework for Impact Reporting (June 2022).

Analysis Of Eligible Projects

This section provides details of our analysis of eligible projects, based on their environmental benefits and risks, using the "<u>Analytical Approach: Shades Of Green Assessments</u>".

Overall Shades of Green assessment

Based on the project category shades of green detailed below, the expected allocation of proceeds, and considering the environmental ambitions reflected in Østfold Energi's Green Financing Framework, we assess the framework as Dark green.



Activities that correspond to the long-term vision of a low-carbon climate resilient future.

Our <u>Shades of Green</u> <u>Analytical Approach</u> >

Green project categories

Renewable energy	
Assessment	Description
Dark green	Development, construction, installation, operation, improvement, repair, and maintenance of facilities, as well as the related infrastructure, connected to the generation of electricity from wind, solar, and hydro power subject to (i) a power density above 5W/m2 or (ii) lifecycle emissions below 100g CO2e/kWh, or (iii) run-of-river plants without artificial reservoirs.

Analytical considerations

- Renewable energy projects such as solar, wind, and hydroelectric are key to limiting global warming to well-below 2°C, provided their negative impacts on the local environment, and their physical risks, are sufficiently mitigated.
- Østfold Energi expects to allocate 90% of proceeds to renewable energy projects, of which 80% of proceeds is intended to be allocated to hydropower, 5% to solar, and 5% to wind projects. These investments support the 1.5 C scenario pathways. The pathways imply that almost all electricity is supplied from zero or low-carbon sources by 2050. In addition, the company has taken steps to address physical climate risks, impacts on biodiversity, and circularity in the value chain. As a result, we assess these projects as Dark green. In Norway, where the issuer operates, the electricity supply mix is almost exclusively based on renewables (98% in 2022), with hydropower playing a central role (88%). In line with its nationally determined contribution under the Paris Agreement and the overarching goal of becoming a low-emissions society by 2050, Norway is committed to reducing greenhouse gas emissions by 90%-95% compared to 1990 levels. All power produced by financed assets will be connected to the Norwegian grid system.
- Hydropower projects can produce notable emissions during construction and from water reservoirs. Therefore, we view positively that the framework includes thresholds for lifecycle emissions or power density for facilities that are not run-of-river and involve reservoirs. The hydropower projects financed will have a power density above 5W/m2, or lifecycle emissions below 100 g CO2e/kWh, or run-of-river plants without artificial reservoirs, in line with the EU Taxonomy's substantial contribution technical screening criteria for the climate mitigation objective. The financed Gravdalen hydropower station will utilize a 330-meter drop between the regulated Kvevotni reservoir and the river intake in Gravdalen. It is expected to achieve annual production of about 60 GWh (about 3,000 households' consumption), which will contribute to the issuer's goal of developing 150 GWh of renewable energy by 2027.

- Østfold Energi's assets are exposed to physical climate risks, such as increased extreme precipitation, flooding, and landslides. These events, which are becoming more frequent and severe, can cause infrastructure and operations disruptions. In response to this challenge, the issuer has said it will conduct risk assessments and invest in infrastructure measures that enhance resilience such as flood prevention systems and monitoring technology. It also commits to develop contingency plans and diversify its energy production.
- Renewable energy sources can have a negative impact on local biodiversity. The Norwegian legislation relating to EIAs provides detailed procedures to be followed for projects that affect the environment, either through their size, production volume, or the proposed location. An EIA is mandatory for all major industrial and infrastructure projects, including renewable energy projects, and without a validated EIA no permit can be issued. In line with Norwegian regulation, Østfold Energi assesses local environmental impacts, especially on biodiversity.
- Hydropower assets typically disrupt aquatic biodiversity and local habitats. The issuer is implementing risk management measures. We note positively that the issuer intends to finance the "Terrestrial and aquatic biodiversity conservation" activity that will address river and land biodiversity aspects. Østfold Energi's solar power projects will be located in areas that have already been affected by human activity and do not have a conservation value. Additionally, upon decommissioning a solar or wind park, the landscape must be restored to its natural state as far as possible.
- There are carbon emission considerations at various stages of the lifecycle of solar PV panels and wind turbines, which range from sourcing of materials, manufacturing, transportation, and the equipment's end of life. Norwegian regulations set clear requirements for decommissioning wind and/or solar facilities. During the operational period, the concession holder must allocate financial resources to cover decommissioning costs.

District heating and cooling		
Assessment	Description	
Medium green	Development, construction, installation, operation, improvement, repair, and maintenance of facilities, as well as the related infrastructure, connected to district heating and cooling where at least 50% of the fuel comes from renewable sources such as wood chips from sustainably certified forests, geothermal heat, electric heat pumps, and waste heat from nearby industries.	
	Exclusion: Investments in waste incineration facilities that are mainly fueled by residues from households and/or commercial activities will not be included.	

Analytical considerations

- Efficient district heating systems can contribute to the transition toward a low-carbon climate-resilient future, though their sustainability benefits depend heavily on their energy inputs, which may be associated with significant emissions and varying sustainability credentials.
- We assess investments in the issuer's efficient district heating and cooling network as Medium green. The project requires that at least 50% of the fuel comes from renewable sources such as wood chips from sustainably certified forests, geothermal heat, electric heat pumps, and waste heat from nearby industries, which is in line with the EU Taxonomy's substantial contribution technical screening criteria for the climate mitigation objective. The issuer confirmed that currently 99% of the fuel is from renewable sources. Waste heat is collected from a nearby biorefinery.
- Østfold Energi owns and operates six district heating systems in Østfold. In Sarpsborg, heat pumps are used as a base load for district heating production. The Mysen facility uses wood chips, while at Rakkestad heat production is based on heat from the WtE plant. The company uses wood chips from sustainable managed forests certified by PEFC, which reduces certain risks relating to supply chain sustainability. The WtE plant follows the principles of the waste hierarchy and incinerates waste that can't be recycled. In addition, if successful, the investment in carbon capture technology at the WtE plant outlined in this framework will reduce greenhouse gas emissions.
- Similarly to renewable energy projects, Østfold Energi has analyzed what physical climate risks are relevant to the financed assets. Among these are increased extreme precipitation, flooding, and landslides. However, the adaptation measures are still to be developed.

Pollution prevention and control

Assessment	Description
Medium green	Investments and expenditure related to development, construction, installation, operation, improvement, repair, and maintenance of facilities, as well as related infrastructure, connected to carbon capture, where the captured carbon is safely transported to selected end-users of captured carbon (either stored, or, if used, resulting in a net reduction of greenhouse gas emissions in a lifecycle assessment).

Analytical considerations

- Carbon capture, utilisation, and storage (CCUS) is likely to play a central role in a low-carbon climate-resilient future. Under CCUS, carbon dioxide may be directly removed from the air or captured at power generation and/or industrial facilities. Captured carbon dioxide is then transported to long-term geological storage (CCS) facilities, or can be used as an input in other industrial processes (CCU). However, potential negative impacts include: the risk of leaks during carbon dioxide transportation and storage, the level of permanence and potential for reversibility, and the energy-intensive nature of the process. Adequate leakage monitoring and detection systems play an important role, as do comprehensive lifecycle emissions assessments.
- CCUS will be applied to a WtE facility. Captured carbon dioxide is routed either toward utilization (CCU) in the first years of operation or toward storage in the later stages of project implementation. CCU facilities process separated carbon dioxide into a new secondary raw material, creating sustainable carbon cycles and leading to a reduction in carbon dioxide emissions compared to alternative scenarios. This leads us to assign a Medium green shade. CCU has lower climate benefits compared to CCS because of the potential release of emissions downstream in the value chain.
- The CCUS plant should begin its operations in 2025. Captured CO2 will be sold to a third party that, in turn, will sell it to final users. The issuer has said that the final users will be local businesses likely from the food, beverage, construction industries. The issuer confirmed that an enhanced hydrocarbon recovery is excluded from potential uses. The actual climate impact of the captured carbon may be different depending on its final use and permanence level.
- The WtE facility at Rakkestad is the largest source of greenhouse gas emissions in Østfold Energi's portfolio. WtE provides a disposal solution for waste that cannot be recycled, reused, or avoided, and currently allows for the release of carbon contained in the waste materials and products. It incinerates a mix of household and industrial waste and does not receive any hazardous waste. The facility has a permit from the Norwegian Environment Authorities and the plant complies with the measurement and reporting regime defined by the authorities for environmental protection.

Assessment	Description	
Dark green	Investments and expenditure related to the protection, preservation, and restoration of marine and watershed environments natural landscapes related to the rivers supplying water to the issuer's hydropower facilities.	

Analytical considerations

Terrestrial and aquatic biodiversity conversation

• Maintaining the resilience of biodiversity and ecosystem services, globally, depends on the effective and equitable conservation of 30%–50% of the Earth's land, freshwater, and ocean areas, including currently near-natural ecosystems. The protection and restoration of terrestrial and freshwater ecosystems can generate multiple benefits, such as biodiversity conservation, and are consistent with the 2030 targets of the Convention on Biological Diversity. We therefore assess these solutions as Dark green.

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- The projects in this category provide several benefits to the environment, both to local habitats and as a climate adaptation measure. In fact, protection measures can help prevent soil erosion and sedimentation, preserve water quality, and maintain the integrity of riverbeds and aquatic habitats--remediating or avoiding potential harm caused by Østfold Energi's hydropower investments and facilities. Furthermore, while restoration efforts might often be in line with biodiversity requirements, they also contribute to climate change adaptation by creating resilient ecosystems that can better withstand extreme weather events and changes in precipitation patterns.
- Example of projects include, but are not limited to, enhancing fish habitats through restoring tributaries, financing salmonand trout hatcheries, releasing fish into the reservoirs, and monitoring the fish population.

S&P Global Ratings' Shades of Green



Note: For us to consider use of proceeds aligned with ICMA Principles for a green project, we require project categories directly funded by the financing to be assigned one of the three green Shades.

LCCR--Low-carbon climate resilient. An LCCR future is a future aligned with the Paris Agreement; where the global average temperature increase is held below 2 degrees Celsius (2 C), with efforts to limit it to 1.5 C, above pre-industrial levels, while building resilience to the adverse impact of climate change and achieving sustainable outcomes across both climate and non-climate environmental objectives. Long term and near term--For the purpose of this analysis, we consider the long term to be beyond the middle of the 21st century and the near term to be within the next decade. Emissions lock-in--Where an activity delays or prevents the transition to low-carbon alternatives by perpetuating assets or processes (often fossil fuel use and its corresponding greenhouse gas emissions) that are not aligned with, or cannot adapt to, an LCCR future. Stranded assets--Assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (as defined by the University of Oxford).

Related Research

- Analytical Approach: Second Party Opinions, Mar. 6, 2025
- FAQ: Applying Our Integrated Analytical Approach For Second Party Opinions, Mar. 6, 2025
- Analytical Approach: Shades Of Green Assessments, Jul. 27, 2023
- <u>S&P Global Ratings ESG Materiality Maps, Power Generators</u>, 2022
- S&P Global Ratings ESG Materiality Maps, Utilities Networks, 2022

Analytical Contacts

Primary contact

Anna Liubachyna

London +442071760494 Anna.liubachyna @spglobal.com Secondary contacts

Pierre-Brice Hellsing

Stockholm +4684405906 Pierre-brice.hellsing @spglobal.com

Sofia Singh Digpaul

London +442071766750 Sofia.singh.digpaul @spglobal.com

Tim Axtmann

Oslo Tim.axtmann @spglobal.com

Per Karlsson

Stockholm +4684405927 Per.karlsson @spglobal.com Standard & Poor's Financial Services LLC or its affiliates (collectively, S&P) receives compensation for the provision of the Second Party Opinions product and the European Green Bond External Review product (separately and collectively, Product).

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