

Eligible Green Projects Assessment Summary

Eligible projects under Solör Bioenergi's Green Finance Framework are assessed based on their environmental benefits and risks, using Shades of Green methodology.

Renewable energy Dark to Medium green

Facilities for producing biofuel based on forestry waste and residues and from recycled wood waste, such as impregnated and treated wood.

Facilities for district and local heating that use at least 95% wood-based biofuel, or facilities for recovering and distributing waste heat from nearby industries. This also includes investments in converting facilities currently running on fossil fuels to reach the 95% threshold.

Rail-related infrastructure needed for the transport, loading, off-loading, and storage of biomass to and from production plants.

Distribution systems connecting end-users with district and local heating.

Pollution prevention and control Dark green

Recycling facilities, such as environmental terminals handling impregnated and treated wood waste, enabling recycling and energy recovery.

Technologies and systems that reduce emissions to air and water, including nitrogen oxides, flue gas, sulfur, particle pollution and other toxic pollutants.

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

Solör Bioenergi provides renewable energy and district heating based on forestry waste headquartered in Stockholm. It produces wood-based bioenergy for the public and private sectors including households, industrial customers, and local and regional governments (including municipalities). The company operates through the entire value chain, from procurement, production, and distribution to the sale of energy, in the form of district heating, industrial steam, electricity, and various biomass products. Operations are concentrated in Sweden (76% of net sales in 2022), Norway (21%), and Poland (3%). Solör Bioenergi is a private company, owned by investment firms Nordic Infrastructure AG (60% ownership share) and Polhem Infra KB (40%). Nordic Infrastructure AG is 100% owned by Swiss investment company BE Bio Energy Group AG.

Material Sustainability Factors

Climate transition risk

Energy generation is the largest direct source of greenhouse gas (GHG) emissions globally, making this sector highly susceptible to 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 are more often pushing 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 technologies will play a vital role in reducing emissions associated with power and heat, which will be crucial for limiting global temperature rise to 1.5°C.

Physical climate risk

Given fixed assets, energy installations are relatively more exposed to physical climate risks compared to other sectors. For stakeholders, extreme weather events, including wildfires, hurricanes, and storms are becoming more frequent and severe and can result in outages for large populations of users. For bioenergy producers, these natural disasters and extreme weather events can have direct, negative effects on feedstock supply. In turn, these dynamics, coupled with regulatory pressure to preserve security of supply, are driving players to enhance the resilience of assets. The physical climate risks generally involve significant financial losses for operators due to repairs and more importantly exposure to extreme price spikes or claims due to business disruption. We expect these dynamics to continue but vary regionally depending on regulatory responses.

Pollution

The combustion of biofuels generates other air emissions--notably sulfur oxides (SOx), nitrogen oxides (NOx), particulates and volatile organic compounds (VOCs)--which create additional regulatory risks and potential operating cost increases and legal liabilities. Pollution from fuel stations can also create human health risks, especially for local and indigenous communities.

Biodiversity and resource use

In addition to being the main source of virgin raw materials for the forest products industry and bioenergy producers, forests also provide a wide range of ecosystems services, including carbon sequestration, water filtration and storage, pollution capture, soil

quality, and habitat for biodiversity. Various stakeholders are engaged in ensuring land, water, and wildlife conservation. A number of regulatory bodies have mandated setting aside certain areas of land in order to protect biodiversity.

Impact on communities

Operating biofuels projects in remote areas or densely populated areas can harm communities given land use requirements, pollution affecting public health, and using local resources. Toxic air emissions from plants can lead to severe and long-lasting health consequences for local communities if not effectively mitigated. Moreover, service disruptions and fires can pose serious, and sometimes irreversible, community health and safety risks.

Issuer And Context Analysis

The project categories in Solör Bioenergi's green finance framework (renewable energy and pollution prevention and control) aim to address climate transition risk and pollution--two of the company's most material sustainability factors. Biofuel production and heat, electricity, and steam generation projects will receive the majority of the green loan proceeds. The biofuel produced from forestry waste allows the company's clients to reduce their reliance on fossil fuels in their heating and electricity use while also promoting circular economy practices. By financing recycling facilities to repurpose forestry waste as an energy feedstock, Solör Bioenergi is able to reduce waste associated with their suppliers' existing forestry operations and repurpose impregnated and treated wood waste. By financing rail-related infrastructure, the framework also addresses emissions that may arise in the company's value chain during transport, loading, and storage of biomass. The company benchmarks its production facilities to identify improvement areas and implement best practices across its operations.

Physical climate risk is relevant for the company's bioenergy, heat, power, and steam production assets, and biodiversity and resource use risks are especially pertinent for the company's suppliers, whose forestry operations may cause habitat disruption. Solör Bioenergi addresses physical climate and forestry risks through indirect supply chain engagement. This energy from biofuels is renewable, but the combustion of forestry biomass can still lead to negative effects on the environment if precautions are not taken to ensure that virgin forests are not compromised as part of the process. To address this risk, Solör Bioenergi requests environmental certificates from suppliers to ensure compliance with European or local sustainability criteria. Solör Bioenergi does not have an explicit supply chain management policy and relies on these certifications and high Swedish and Norwegian standards to ensure suppliers operate sustainably.

Reducing fossil fuel reliance for its customers is the core of Solör Bioenergi's business, but it does not yet have emissions reduction goals for its own operations. The fuels the company uses in district heating plants in Sweden and Norway come primarily from biofuels based on locally sourced waste and residues from forest-based industries (99% and 96%, respectively). However, only 33% of the company's fuel comes from renewable sources in its Polish operations, though the company has plans to phase out all fossil fuels. The company plans to implement operational improvement projects which include increasing the proportion of biofuels in operations and increasing energy efficiency, but it has not yet set concrete emissions targets other than ending coal use in Poland by 2040.

While the company will primarily dedicate funds to expanding renewable fuel and energy production, the financing may introduce pollution risks if it does not take appropriate mitigation measures. The framework addresses this risk through its pollution prevention and control project category, and we note that in 2022, the company installed eight air filters to reduce particle emissions from power plants. These filters may also reduce the company's impact on surrounding communities by decreasing their exposure to harmful pollutants. Although heat production may take place at plants where fossil fuel boilers are sometimes used as backup capacity, the framework specifies that green finance instruments will not be used to finance assets linked to fossil fuel generation. In addition, the framework includes waste heat

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recovery from a range of industries, including those that use petroleum and petroleum gas in their processes. These assets may thus carry obsolescence risk as the energy transition continues, though we do not expect a significant proportion of funds to be allocated to this project type. We believe waste heat collection is not facilitating the fossil fuel process and note the waste heat recovery assets for fossil fuel projects can also be used for other project types.

Alignment Assessment

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

Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✗

- ✓ Green Bond Principles, ICMA, 2021
- ✓ Green Loan Principles, LMA/LSTA/APLMA, 2023

✓ Use of proceeds

All the framework's green project categories are shaded medium and dark green, and the issuer commits to allocate the net proceeds issued under the framework exclusively to eligible green projects. Please refer to Analysis of Eligible Projects section for more information on our analysis of the environmental benefits of the expected use of proceeds.

Solör Bioenergi commits to allocate an amount equal to the net proceeds from instruments issued under its Green Finance Framework to invest in the defined green eligible projects in two categories: renewable energy and pollution prevention and control. Projects will focus on biofuel production, heat, electricity and steam generation, transport, transmission and distribution, waste management, and reduction of air and water pollutants. Furthermore, the issuer communicates a list of exclusions comprising investments in fossil energy generation, nuclear energy generation, research and/or development within weapons and defense, potentially environmentally negative resource extraction, gambling, and tobacco.

✓ Process for project evaluation and selection

Solör Bioenergi describes its process for project evaluation and selection in its Green Finance Framework where climate change mitigation and pollution prevention and control are outlined as environmental objectives associated with renewable energy and pollution prevention and control. In addition, the entity has established an internal Green Finance Committee consisting of management team members that is responsible for evaluating and selecting the eligible projects. Solör Bioenergi commits to review and manage the social and environmental risks associated with the project according to its internal suite of policies, including the group's environmental, health, environment, and safety, and working environment policies. While these documents were shared with S&P, they are not currently publicly available.

✓ Management of proceeds

Solör Bioenergi commits to earmarking the net proceeds from instruments issued under its Green Finance Framework to finance and refinance eligible green projects. The company's finance department will ensure that the amount of Green Projects at all times exceeds the total amount of Green Finance Instruments outstanding, and if a green project already funded by a green finance instrument is sold or loses eligibility, it will be replaced with another qualifying green project. The company will manage net proceeds from instruments issued under the framework in accordance with its overall liquidity management policy and may invest proceeds in short-term money market instruments or hold them as cash pending allocation.

✓ Reporting

Solör Bioenergi commits to publish annual allocation and impact reports so long as there are green finance instruments outstanding. The allocation report will include the amounts invested in each of the green project categories, examples of financed projects, and the amount of net proceeds awaiting allocation. The impact report will include the actual impact of project financed, using metrics such as GHG savings, volume of produced biofuel, and energy recovered from wood waste, among others.

Analysis Of Eligible Projects

This section provides details of our analysis of eligible projects, based on their environmental benefits and risks, using the Shades of Green methodology.

Solör Bioenergi expects to allocate the majority of the proceeds from this round of financing to biofuel production and heat, electricity, and steam generation. As we understand, waste heat recovery would only constitute a minor proportion of expected proceeds allocation.

The eligible assets will include assets for which Solör Bioenergi has commenced operations or placed-in-service prior to the applicable green financing, and the company does not use a look-back period to determine the eligibility of refinanced assets.

The framework excludes the financing of fossil fuel generation, nuclear energy generation, research and/or development within weapons and defense, potentially environmentally negative resource extraction, gambling, or tobacco.

Dark green

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

Our [Shades of Green Analytical Approach](#) >

Overall Shades of Green assessment

Based on the project category shades of green detailed below, and consideration of environmental ambitions reflected in Solör Bioenergi's Green Finance Framework, we assess the framework as Dark green.

Green project categories

Renewable energy

Assessment

 Dark to Medium green

Description

- i) Biofuel production: facilities for producing biofuel based on forestry waste and residues as well as from recycled wood waste, such as impregnated and treated wood.
- ii) Heat, electricity, and steam generation: facilities for district heating and local heating that use at least 95% wood-based biofuel as defined above, or facilities for recovering and distributing waste heat from nearby industries. Also including investments in converting facilities currently running on fossil fuel to reach the 95% threshold.
- iii) Transport: rail-related infrastructure needed for the transport, loading, off-loading and storage of biomass to and from our production plants.
- iv) Transmission and distribution: distribution systems connecting end-users with district and local heating.

Analytical considerations

- Bioenergy is often seen as a renewable energy source, especially when the feedstock is waste from other industrial processes such as forestry. When biomass is used to produce energy, CO2 is released during combustion, sometimes at levels similar to coal. That said, as more biomass is produced, an equivalent amount of carbon is absorbed, making bioenergy a near zero-emission fuel source as long as it is accompanied by sustainable forestry practices that maintain or increase carbon sinks and management of other lifecycle emissions.
- Solör Bioenergi's biofuel production is based on forestry waste, such as fir and pine cutter shavings and thinnings, as well as impregnated and treated wood. The forestry waste is sourced locally (from either Sweden, Norway, or Poland) and complies with EU Renewable Energy Directive II (RED II) requirements as confirmed by local regulation or eligible third-party sustainability certificates. This is important from a sustainability perspective because it minimizes land-use concerns and mitigates the environmental risks related to bioenergy heat production and forestry dedicated to industrial pellet production. We note that as the company does not require additional sustainability criteria for forestry operations from which its waste feedstocks are

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sourced, our shading relies on the jurisdictional context of strong forestry regulations in Sweden and Norway in addition to high levels of voluntary environmental certifications such as FSC and PEFC limiting the risk of sourcing waste from unsustainable operations. For these reasons, we shade this project type as Dark green.

- Some of Solör Bioenergi's production takes place at plants where fossil fuel boilers may sometimes be used as backup capacity. The company's Swedish and Norwegian operations use more than 95% biomass, but in Poland, only 33% of the company's energy production comes from renewable sources, though the company aims to increase that percentage through financings under their framework. Only 3% of the Solör Bioenergi's net sales came from its Polish operations in 2022 and the company has plans to phase out all fossil fuels across its operations by 2040.
- A small proportion (5%-6%) of the company's heat, electricity, and steam production comes from waste heat collection. However, a percentage of this waste heat is collected from industries using petroleum and petroleum gas in their processes. Waste heat collection, regardless of fuel source, is included in the EU Taxonomy as a sustainable project category and we generally view it as a positive from a shading perspective as it recovers an otherwise unused resource and avoids the need for additional primary energy production that may carry associated emissions or other impacts. We highlight that it may be subject to obsolescence risk if connected to fossil fuel assets should the energy transition accelerate and may be seen as valorizing unsustainable practices, making it a Light green element of the overall category. Overall, however, waste heat collection from industries related to fossil fuels comprises only a small amount of the company's operations, and that a minimal proportion of the financing will be allocated to these projects.
- The issuer does not specify the life-cycle emissions associated with its district heating operations, nor has it installed carbon capture and sequestration technologies at its facilities at this time. However, the company currently has two biochar production sites which can be used to slow atmospheric GHG absorption when put into soil, increase water quality, and promote forest growth, which we view positively.
- Physical climate risks could affect Solör Bioenergi's direct operations if their plants are in areas prone to more frequent extreme weather events. Physical climate risks may also be material for the company's suppliers in the form of climate-driven pests or drought that could affect access to forestry waste. The company carried out a climate risk assessment in 2023 and its assets were not assessed to be vulnerable to physical climate risks, though it has invested in additional storage capacity at some sites. While Solör Bioenergi does not directly engage with suppliers to understand their physical climate risks, the company takes these risks into account as part of its sourcing strategy and due diligence.
- The company invests in distribution of green energy through its investments in district heating grids, transporting bioenergy produced heating and steam to its customers. Green electricity is fed into local electricity grids. Most of the biofuel transport is carried out by external suppliers, but the company also owns and reinvests in rail transport for some of its biofuels, decreasing its reliance on hard-to-abate fuels used in other forms of transport. For these reasons, we shade this project type as Dark green.

Pollution prevention and control

Assessment

 Dark green

Description

i) Waste management: recycling facilities, such as environmental terminals handling impregnated and treated wood waste enabling recycling as well as energy recovery.

ii) Reduction of air and water pollution: technologies and systems that reduce emissions to air and water, including nitrogen oxides, flue gas, sulfur, particle pollution and other toxic pollutants.













Analytical considerations

- Reducing air pollution (such as nitrogen oxides and particulates) is key to achieving a sustainable future, as these pollutants can cause significant health problems to exposed populations.
- Solör Bioenergi's three recycling facilities and terminals receive, process, and store environmentally hazardous impregnated wood waste for sale as biomass, and some facilities have permits to produce thermal energy from waste wood. These facilities reduce the amount of waste produced by other industrial processes and promote circular economy practices by repurposing materials that were previously considered to be waste.

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- Solör Bioenergi also reduces and prevents the discharge of harmful chemicals and particulates into the air by installing filter technologies to mitigate pollution from their energy plants. In 2022, the company installed eight such filters.
- Although recycling has a positive environmental impact, the process itself releases emissions and waste. Solör Bioenergi does not currently have any processes to manage or mitigate emissions from waste and recycling beyond regulatory compliance, though we believe that the high standards in the company's countries of operations mitigate many environmental risks. For these reasons, we shaded this project category as Dark green.

S&P Global Ratings' Shades of Green

Assessments					
 Dark green	 Medium green	 Light green	 Yellow	 Orange	 Red
Description					
Activities that correspond to the long-term vision of an LCCR future.	Activities that represent significant steps toward an LCCR future but will require further improvements to be long-term LCCR solutions.	Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term LCCR solutions.	Activities that do not have a material impact on the transition to an LCCR future, or, Activities that have some potential inconsistency with the transition to an LCCR future, albeit tempered by existing transition measures.	Activities that are not currently consistent with the transition to an LCCR future. These include activities with moderate potential for emissions lock-in and risk of stranded assets.	Activities that are inconsistent with, and likely to impede, the transition required to achieve the long-term LCCR future. These activities have the highest emissions intensity, with the most potential for emissions lock-in and risk of stranded assets.
Example projects					
 Solar power plants	 Energy efficient buildings	 Hybrid road vehicles	 Health care services	 Conventional steel production	 New oil exploration

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

- [ESG Materiality Maps Power Generators](#), May 18, 2022
- [FAQ: Applying Our Integrated Analytical Approach for Use-of-Proceeds Second Party Opinions](#), July 27, 2023
- [Analytical Approach: Second Party Opinions: Use of Proceeds](#), July 27, 2023

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