



Swedavia

Green Financing Second Opinion

September 19, 2022

Executive Summary

Swedavia AB (“Swedavia”) is a state-owned company that operates and develops ten airports in Sweden. Although Swedavia is not an aircraft operator, it provides infrastructure that supports this industry that still relies heavily on fossil fuels.

Under its 2022 green finance framework, Swedavia seeks to finance and refinance green buildings and infrastructure including a potential new pier on an existing airport terminal, energy efficiency retrofits, onsite renewable energy generation, water and waste management, and low-emissions vehicles and charging infrastructure. Fossil fuel and nuclear energy generation as well as potentially environmentally negative resource extraction are explicitly excluded. Changes from Swedavia’s previous framework published in 2019 include additions of heating plants powered by renewable liquid fuels, water recycling and management, and low carbon aircraft infrastructure.

We rate the framework **CICERO Light Green** and give it a governance score of **Excellent**. A Light Green shading is primarily due to the possibility that a majority of proceeds could be allocated to a new pier at Stockholm Arlanda Airport that would increase airport capacity and potentially associated aircraft emissions. Other elements of the framework are more fully aligned with a low carbon future and darker Shades of Green, particularly the update from the previous framework to include charging stations for electric aircraft and green hydrogen refuelling stations as eligible projects. Swedavia has continued to strengthen its governance, including commitments to ambitious climate targets, concrete implementation measures and partnerships, and robust project selection processes and allocation and impact reporting.

Strengths

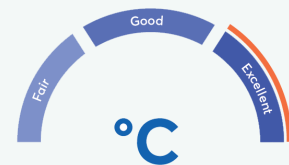
Swedavia has developed ambitious climate targets in a difficult to abate sector and demonstrated its ability to achieve these goals. Surpassing many of its airport operator peers, Swedavia has already achieved net zero for its own operations. Swedavia created additional timebound commitments supported by concrete action steps to require the decarbonisation of its airport partners’ operations, support airlines’ transition to sustainable aviation fuels (SAFs) and electric aircraft, and contribute to decarbonising domestic and international flights at the country level. Despite aviation being among the most challenging sectors to mitigate, Swedavia is moving itself and its partners along a clear transition pathway.

SHADES OF GREEN



°CICERO
Light Green

GOVERNANCE ASSESSMENT



GREEN BOND AND LOAN PRINCIPLES

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



Swedavia has also actively engaged policymakers, researchers, and passengers to support an aviation sector climate transition. Through diverse partnerships and initiatives, Swedavia is supporting technological and policy advances to transform the aviation industry away from reliance on fossil jet fuel. Although technological breakthroughs and significant decarbonisation outcomes from these partnerships are expected to be achieved over longer time horizons, they create an essential foundation for future improvements in a difficult to abate sector.

Swedavia's robust materiality analysis highlighting the importance of climate impacts is another strength. Undertaking this review and integrating findings into strategy is an indicator of strong governance practices.

Weaknesses

Projects under this framework may include direct investments in infrastructure such as new piers increasing the capacity of Swedavia's airports. Investors should be aware that these potential investments can lead to passenger increases and associated rebound and lock-in risks through investments into fossil fuel dependent aviation infrastructure. The issuer notes that emissions associated with any increase in air traffic are covered by Sweden's national targets, which require all of its domestic and international air travel to be fossil-free by 2045, and will be mitigated through a transition to SAFs and electric aviation. Although Swedavia is taking positive steps to support aviation sector mitigation, SAF supply constraints and demand limitations due to high costs, technological and commercialization challenges to advance electric or hydrogen aircraft, and other significant barriers to aviation's climate transition create meaningful risks that if Swedavia facilitates greater air traffic through investments such as new piers, emissions and associated climate risks will increase in absolute terms. The framework would benefit from excluding direct investments in airport capacity increasing infrastructure.

Pitfalls

Swedavia's green building criteria could be strengthened to reduce material embodied emissions and ensure sufficient energy performance during building operations. Although Swedavia undertakes environmental impact assessments of its construction materials, it does not yet have clear performance thresholds for more sustainable sourcing. Swedavia's building ambitions also fall short regarding energy performance criteria, creating possible transition risks. According to the IEA, efficiency of building envelopes needs to improve by at least 30% by 2025 to keep pace with increased building size and energy demand, exceeding Swedavia's requirements for new buildings and option for refurbishment. We encourage the issuer to make its green building criteria more robust and comprehensive.

Although biofuels can substantially cut emissions relative to fossil fuels, concerns remain regarding the actual climate and environmental impacts of these alternatives. Lifecycle emissions benefits may be limited by transport distances or direct and indirect land use change depending on country of origin and feedstock. Unsustainable sourcing practices can lead to deforestation, biodiversity loss, harmful agricultural practices, or competition with food production. Swedavia is taking positive steps such as seeking EU Renewable Energy Directive II (RED II) compliance, using waste-based feedstocks, and excluding palm oil and its residues, but its RED II verification processes and feedstock countries of origin are unclear, and it is difficult to fully mitigate these risks. We encourage the issuer to continue to strengthen safeguards and supplier engagement on this topic.



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1 Swedavia's environmental management and green finance framework

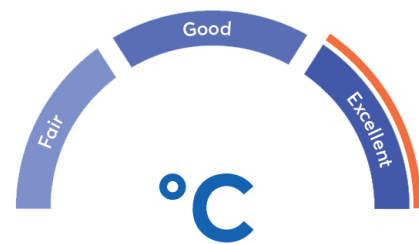
Company description

Swedavia AB (“Swedavia”) is a fully state-owned company headquartered at Stockholm Arlanda Airport. Established in 2010, it owns, operates, and develops ten airports in Sweden and conducts real estate operations. With SEK 2.72 billion in net revenue and more than 2,200 employees, Swedavia served 11.9 million customers in 2021, around 70% lower than 2019 pre-pandemic levels. While Swedavia does not operate airplanes itself, it provides the infrastructure that supports this difficult to decarbonise industry that still relies heavily on fossil fuels.

This green finance framework is an update to Swedavia's previous framework dated October 2019. Under that framework, Swedavia has issued SEK 1.25 billion in green bonds, or nearly a quarter of the company's total outstanding bonds, as of September 2021.

Governance assessment

Swedavia's climate and environmental policies create timebound commitments covering not only its own airport operations where it has already achieved net zero emissions, but also its partners' airport operations, the transition to lower carbon SAFs, and decarbonising domestic and international flights. While aviation is a difficult to abate sector, Swedavia has taken concrete steps to achieve these goals, including through its incentive programs for aircraft operator partners and airport contractors and engagement with policymakers, researchers, and passengers. Swedavia undertakes robust reporting and recently published a new materiality analysis. Although Swedavia does not yet report in full alignment with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), it shares updates with its board on these topics and has begun integrating some adaptation measures into its built infrastructure designs.



Swedavia has established a clear selection process for projects eligible under the framework incorporating sustainability expertise with veto power in decision making. In addition to framework criteria, Swedavia considers alignment with its policies including energy and environmental assessment as well as screening for other potential risks and controversies.

In terms of reporting, Swedavia provides robust annual public disclosures on allocation and impact. It includes relevant indicators across categories and an index of metric methodologies and undertakes evaluation by an external auditor.

The overall assessment of Swedavia's governance structure and processes gives it a rating of **Excellent**.



Sector risk exposure

Physical climate risks. Aviation is a highly exposed sector to physical climate risks. Weather events such as snowstorms and extreme precipitation, high winds, or extreme temperatures that cause costly service disruptions are expected to increase in frequency. Flooding and forest fires are of particular concern in the Swedish context. Insurance premiums may rise for highly exposed assets, including some airports. For Swedavia's airline partners, fossil-based jet fuel and biofuel production and transportation can be impacted by extreme weather events such as storms and droughts.

Transition risks. Due to the profound changes needed to limit global warming to well-below 2°C, transition risk affects all sectors. Swedavia is exposed to transition risks from policy changes that may increase the cost of carbon, leading to higher building operating and construction costs. Stricter energy efficiency policies could necessitate costly building refurbishments. Demand for flights and associated airport infrastructure may fall as companies and individuals substitute lower emissions modes of transport (e.g., rail or shipping) or virtual meetings for air travel, a trend accelerated by the COVID-19 pandemic. Swedavia's airline operator partners are exposed to additional transition risks from more ambitious emissions mitigation policies and sustainable aviation fuel (SAF) blending mandates as well as uncertainties around how to mitigate non-CO₂ climate impacts.

Environmental risks. Aviation infrastructure and operations can contribute to local noise and environmental pollution, particularly during construction and from the chemicals used to de-ice planes. For Swedavia's airline partners, fuel supply chain risks include both local pollution, such as from oil spills or pesticide and fertilizer use during biofuel production, as well as land use competition between biofuel feedstock cultivation and food production or biodiversity conservation.

Environmental strategies and policies

Swedavia's own airport operations have been fossil-free since 2020, and in 2021 the company set an ambition to operate net zero airports by 2025. It reported 178 kilotonnes carbon dioxide emissions from its airports in 2021, with 0 from its direct operations, 128 from air traffic, and 50 from ground transportation. Swedavia does not directly report on total emissions of flights to and from its airports.

In 2018, Swedavia set a target for 5% sustainable aviation fuel (SAF) to be used at all Swedish airports by 2025. It reported 0.44% renewable fuel use in 2021, over four times the global aviation sector rate of 0.1% and exceeding its 0.2% interim target, but less than a tenth of the way to achieving its final goal.¹ Swedavia informs us that it expects procurement to rapidly accelerate over the coming years as current supply limitations ease and local SAF production increases. The jet biofuel used at its airports is currently sourced from used cooking oil and other food waste residues. To achieve its biofuels target, Swedavia facilitates an incentive program for airlines in which it pays 50% of the SAF premium, purchases biofuels for its own business air travel, offers a coordinated tender process for biofuels to other customers to support increased demand, and engages in communication campaigns with passengers and policymakers to encourage SAF purchasing. The issuer informs us that it views biofuels as the best available current technology for reducing flight emissions, particularly for intercontinental travel.

¹ Aviation | IEA ([iea.org](https://www.iea.org))



Swedavia has also committed to providing infrastructure for electric aircrafts at all of its airports by 2025. It is currently assessing power supply and other infrastructure needed to achieve this goal and does not require electric aircrafts to pay airport charges. The issuer informs us that electric flights will likely be most applicable for decarbonising shorter, primarily domestic flights due to battery capacity limitations.

As a state-owned company, Swedavia's climate activities should be viewed against the backdrop of Sweden's national climate policies for the aviation sector. The Swedish government has set a goal for domestic air transport to be fossil-free by 2030 and all domestic and international air travel to be fossil-free by 2045. Achieving this 2030 target would require around 15% of jet fuel in Sweden to come from renewable sources,² aligning with the International Energy Agency (IEA) net zero by 2050 scenario that also requires 15% fossil-free aviation fuels by that time.³ Under a 2021 Swedish law, Swedavia now implements environmentally differentiated charges for take-off and landing at Stockholm Arlanda Airport and Göteborg Landvetter Airport, reducing costs for flights with improved climate performance.⁴ Sweden has also introduced a greenhouse gas reduction mandate for aviation fuels, requiring 0.8% lower emissions than fossil jet fuel starting in 2021 and increasing requirements gradually to achieve a 27% reduction by 2030.⁵

Swedavia is engaged in a variety of sustainable aviation collaborative initiatives with government and other partners. It is following the industry roadmap under the Swedish government's Fossil-Free Sweden (Fossilfritt Sverige) program and is a co-initiator of an innovation cluster "Fossil-Free Air Transport 2045" with Scandinavian Airlines (SAS) and state-owned Research Institutes of Sweden (RISE). To support electric air transportation, Swedavia is a member of the Green Flyway research project, Electric Air Transport in Sweden (ELISE) consortium, and Nordic Network for Electric Aviation (NEA). Swedavia is also part of the Airports Council International (ACI) Europe Climate Task Force aligning airport and airline climate goals with the Paris Agreement and a member of the Nordic Initiative for Sustainable Aviation (NISA) and Fly Green Fund working to secure SAF supplies in the region.

Swedavia regularly reports on progress in its annual and sustainability report, which has been aligned with the Global Reporting Initiative (GRI) core standard since 2010. For the first time in 2021, Swedavia reported on the share of its revenues, OPEX, and CAPEX eligible under the EU Taxonomy. Over the course of 2019-2021, Swedavia undertook and published the results of an in-depth materiality analysis identifying seven priority issues including climate impact. It has begun integrating findings into its strategy, goals, and organizational activities, including the establishment of a new sustainable development department with oversight of climate transition activities.

Swedavia does not fully comply with the recommendations of the TCFD in part due to pandemic-related resource constraints, but it is following some of the guidance, working towards full alignment, and reporting on climate-related risks to its board on a quarterly basis. For Swedavia's two biggest airports, assessment of climate change effects, such as the impact of temperature, precipitation and wind changes on flooding, forest fires, icing, and maintenance, are conducted. According to the issuer, measures such as establishing green roofs to absorb stormwater runoff and increasing the capacity of stormwater infrastructure are already being undertaken to reduce flooding risks.

² How Sweden's roadmap for fossil-free aviation paved the way for a more constructive dialogue regarding aviation and climate change | Journal of Airport Management (hstalks.com)

³ Net Zero by 2050: A Roadmap for the Global Energy Sector | IEA (iea.org)

⁴ Environmental constraints on air transport | IEA (iea.org)

⁵ Ibid.



Swedavia has an environmental and energy policy in place that is reviewed annually in conjunction with the management's review of Swedavia's environmental work and decided by the board of directors. In addition, Swedavia's Code of Conduct sets environmental requirements for suppliers. According to the issuer, all rental/leases/security agreements are required to contribute to Swedavia's overall environmental targets, including its goal to have all airport operations fossil free by 2025.

Swedavia supports the responsible business principles of the UN Global Compact and complies with the environmental management system standard ISO 14001:2015. Its ten airports meet the ACA3+ level under the Airport Carbon Accreditation standard for climate work, and two of its airports are starting new ACA4+ certification, with a goal of achieving this level across all Swedavia's airports by 2025. In 2021, ACI Europe awarded Stockholm Arlanda Airport Eco-Innovation Airport of the Year.

Green finance framework

Based on this review, this framework is found to be aligned with the Green Bond and Loan Principles. For details on the issuer's framework, please refer to the green finance framework dated August 2022.

Use of proceeds

For a description of the framework's use of proceeds criteria, and an assessment of the categories' environmental impacts and risks, please refer to section 2.

Selection

Eligible green assets will be selected by a dedicated Green Finance Committee (GFC) consisting of senior management members including the CEO, CFO, and Sustainable Development Manager. The GFC undertakes a screening for compliance with framework criteria and Swedavia's policies and guidelines as well as potential risks and controversies. Selection decisions will be made in consensus and a list of eligible green assets will be managed by the Head of Treasury and Treasury Department.

According to the issuer, the selection process includes an energy and environmental assessment. External experts are included in in-depth analyses for projects that require an environmental permit or application. The issuer confirmed that Swedavia has its own environmental/sustainability building guidelines, requirements towards suppliers and some climate resilience considerations.

Management of proceeds

Green finance proceeds are tracked by the issuer. Proceeds will not be linked directly to one or more pre-determined eligible green assets but instead be managed at a portfolio level. Swedavia will ensure that the portfolio of eligible green assets exceeds the amount of net proceeds. Any unallocated proceeds will be held in Swedavia's ordinary bank account, and Swedavia will strive to allocate them within one year.

Reporting

Swedavia will report to investors and other market stakeholders on an annual basis as long as green finance instruments are outstanding. This report will be made public on Swedavia's website and includes reporting on use of proceeds and impact reporting. The issuer informs us that impact reporting will be conducted on portfolio basis and on asset level depending on the assets. According to the issuer, the treasury department will be responsible for reporting in close cooperation with the environmental department and other internal stakeholders.

Allocation reporting will include total amount of green finance instruments issued, total amount of unallocated proceeds, share of proceeds used for financing/refinancing, share of proceeds allocated to respective categories



(see Table 1), and a list of eligible green assets including allocated and disbursed amounts. The allocation reporting will be subject to external review.

Impact reporting will include indicators for all categories, such as sustainability certification, reduced/avoided emissions, energy performance, energy savings, renewable energy generation, amounts of waste reduced/avoided/recycled, number of clean vehicles deployed, or share of renewable fuel. Swedavia will report on at least one of the impact indicators per category and on more or all if possible. The methodology of calculating impacts will be disclosed in the reporting.

Reporting under the previous framework included allocation by financing vs. refinancing and eligible project category, descriptions of financed projects, and relevant impact indicators such as building certification and reduction of energy use and emissions, renewable energy annual production and maximum capacity, energy efficiency reductions in energy use, and the number of fossil-free electric vehicles and associated emissions reductions. An independent auditor provided a limited assurance report on allocation.




2 Assessment of Swedavia’s green finance framework

The eligible projects under Swedavia’s green finance framework are shaded based on their environmental impacts and risks, based on the “Shades of Green” methodology.

Shading of eligible projects under Swedavia’s green finance framework

- Proceeds will be used to finance or refinance, in part or in whole, assets that meet the criteria included in Swedavia’s green finance framework. New projects are defined as projects that have been taken into use during the previous twelve months at the time of the approval by the Green Bond Committee.
- The expected allocation between financing and refinancing depends on whether the construction of a new pier at Stockholm Arlanda Airport’s Terminal 5 (“Pier G”) moves forward. There is currently uncertainty due to the pandemic as to whether this additional capacity for planes will be needed. If the Pier G project proceeds, that will account for a majority of the allocation of proceeds as new financing under the green and energy efficient buildings category. If not, the issuer informs us that it expects around 50-60% of proceeds to be used for refinancing and the clean transportation category will be more of an emphasis, with other categories remaining at lower levels.
- Under the previous framework, as expected, 70% of proceeds were used for new financing and 30% for refinancing. Half of proceeds were allocated to the green buildings category, followed by 34% to clean transport, 13% to renewable energy, and 3% to energy efficiency.
- Swedavia has explicitly excluded fossil fuel energy generation, nuclear energy generation, weapons, and defence industries as well as potentially environmentally negative resource extraction, gambling, or tobacco from eligibility under the framework.

Category	Eligible project types	Green Shading and considerations
Green and energy efficient buildings 	All new, refurbished, acquired and existing buildings/infrastructure that meet one of the following criteria: <ol style="list-style-type: none"> i. BREEAM Very Good, BREEAM In-Use Very Good, LEED Gold, Miljöbyggnad Silver or an equivalent well-known environmental certification; or ii. Energy performance certificate (“EPC”) of class A or B; or ii. Where refurbishments have been or will be made reducing energy consumption by at least 25%; or 	Light Green <ul style="list-style-type: none"> ✓ The issuer informs us that this category will primarily focus on new buildings or additions to existing buildings. This will potentially include the Pier G project as noted above as well as improvements to security checkpoints, terminal rebuilding to improve flow of passengers, infrastructure to support intermodal transport, and shopping and restaurant facilities, primarily at the Arlanda Airport. No new terminals are planned. ✓ The issuer informs us that in addition to its framework criteria, the energy performance of new buildings must be at least 25% better than existing building regulations. Under Swedavia’s building guidelines, all fuels used during construction must be renewable, with at least 20% of total energy consumption for vehicles and machinery from either renewable electricity or



v. CEEQUAL certification
Excellent

sustainable biofuels not subject to a reduction obligation. Environmental impact assessments of building materials are also undertaken, though performance thresholds for factors such as embodied emission are unclear. These requirements would apply to Pier G and other planned projects under this category.

- ✓ The issuer confirmed that BREEAM Excellent certification will be required for the Pier G building and CEEQUAL Excellent certification will be achieved for the adjacent Pier G ramps. If Pier G proceeds and increases the capacity of Arlanda Airport, the issuer informs us that the main levers for ensuring emissions do not increase will be transitioning to SAFs and electrical aviation.
 - ✓ Be aware that new buildings at airports like Pier G can lead to capacity increase of passengers and associated significant risks of rebound effects in total emission increase through air travel. Despite its planned BREEAM Excellent certification and 25% energy performance improvement that would usually qualify a building for a Medium Green shading, Pier G is shaded Light Green due to these potential air travel rebound effects.
 - ✓ Beyond Pier G, other criteria in this category are also primarily Light Green. Voluntary environmental certifications cover a broad set of issues related to sustainable development. However, they fall short of guaranteeing an environmentally friendly building, reduction in greenhouse gas emissions during material selection, construction, and operations, and integration of climate resilience. The option of a 25% energy performance improvement for refurbished buildings, while positive, is not fully aligned to the at least 30% improvements required to achieve a low carbon future and does not guarantee the selection of materials with lower embodied emissions.
 - ✓ Parking infrastructure for cars is excluded according to the issuer.
 - ✓ Be aware that construction projects can have potential negative local environmental impacts.
-



Energy efficiency



Energy retrofits such as the usage of LED lighting, switching to more energy-efficient ventilation units, implementation of control systems, extension of district heating and cooling systems, etc.

Medium to Dark Green

- ✓ Energy efficiency investments are key to reducing emissions and are primarily Dark Green.
- ✓ The issuer confirmed district heating is fossil-free, with origin-labelled wind, hydropower, and EU Renewable Energy Directive II (RED II) compliant waste-based biofuel sources. RED II compliance is a positive step to avoid indirect land use change emissions from feedstock production, though verification processes and feedstock countries of origin are unclear. Be aware of biofuel lifecycle emissions from feedstock production and transportation and broader risks to biodiversity and the environment. These aspects are therefore shaded Medium Green.
- ✓ Fossil fuel efficiency improvements are excluded.
- ✓ Consider the potential of rebound effects for energy consumption. It is not clear what level of quantifiable improvements these individual energy efficiency measures would achieve.

Renewable energy



Onsite renewable energy such as solar panels that generate electricity, geothermal energy installations or heating plants powered by renewable liquid fuel.

Medium to Dark Green

- ✓ Solar and geothermal power is key to a low-carbon transition and is shaded Dark Green. During project design and construction, be aware of resilience concerns, land use and biodiversity impacts, and local pollution. Consider lifecycle emissions of energy generation technologies, including from materials sourcing and manufacturing. The issuer informs us that it does not yet consider these embodied emissions in procurement decisions but plans to incorporate them in the future.
- ✓ Renewable liquid fuels used in heating can reduce emissions compared to fossil alternatives. The issuer informs us that it ensures biofuels are RED II compliant and waste based, but RED II verification processes and feedstock countries of origin are unclear. Be aware of biofuel lifecycle emissions during production and transportation and broader risks to biodiversity and the environment. These aspects are therefore shaded Medium Green.



Pollution prevention and control



Investments in water and waste recycling, water and waste minimization and energy/emission efficient water and waste management

Dark Green

- ✓ Water and waste recycling is key for a climate resilient future and a circular economy.
- ✓ This category includes treatment facilities of wastewater that contains monopropylene glycol, which is used for de-icing of airplanes.
- ✓ Swedavia has a zero-landfill policy.

Clean transportation



- Investments in vehicles that are powered entirely by non-fossil fuels, such as electricity, biofuel, hydrogen and synthetic diesel (HVO)
- Investments in infrastructure enabling clean transportation, such as charging stations for electric vehicles and infrastructure related to low carbon aircrafts

Medium to Dark Green

- ✓ Electric vehicles and charging stations are well-aligned with a low carbon future and are shaded Dark Green. According to the issuer, 100% of electricity used to power electric vehicles will be origin labelled from renewable sources. Be aware of the climate and environmental impacts in battery supply chains.
- ✓ The issuer informs us that biofuel feedstocks meet EU RED requirements, including RED II indirect land use change safeguards. Swedavia's processes to verify RED II compliance, such as through certification or supplier engagement, are unclear. Feedstocks include used cooking oil and animal slaughter wastes, but countries of origin and associated feedstock risks and transportation emissions are uncertain. Palm oil and its wastes and residues are excluded, reducing potential deforestation risks.
- ✓ While biofuels can reduce emission compared to fossil alternatives, be aware of lifecycle emissions from biofuel production and transportation and broader risks to biodiversity and the environment. Also consider potential links to industrial meat production and associated transition risks. These biofuel aspects are therefore shaded Medium Green.
- ✓ According to the issuer, hydrogen is not currently used in its operations, but it would source green hydrogen (i.e., generated with renewable energy) if it decides to proceed with hydrogen procurement in the future.
- ✓ The issuer informs us that its vehicle fleet includes all modes of transport at the airport, such as cars, busses, tractors, trucks, and snow ploughs. Hybrid vehicles are excluded, which is positive to avoid fossil fuel use.
- ✓ The issuer informs us that infrastructure related to low carbon aircrafts would include charging



facilities for electrical aircraft and potentially hydrogen refuelling facilities. Drop-in aviation fuels, including biofuels and synthetic fuels, do not require new infrastructure. Infrastructure to support electric and green hydrogen aircraft is well-aligned with the climate transition and is shaded Dark Green.

Table 1. Eligible project categories

More on climate and aviation

Global aviation accounts for around 3.5% of climate impacts due to human activities and would be among the top ten emitters globally if it were a country.⁶ Aviation is warming the climate at about three times the rate that would be expected from carbon dioxide (CO₂) emissions from jet fuel combustion alone due to non-CO₂ climate impacts from other gases and aerosol particles, which require further research to improve measurement and mitigation strategies.⁷ Emissions are also generated in fuel and aircraft supply chains, airport and ground operations, and aircraft end of life.

Although measures to significantly reduce emissions are available, aviation is one of the most difficult to decarbonise sectors and may still rely on some fossil fuels and offsets outside the sector even in a net-zero emissions scenario.⁸ Emissions from airports themselves are much lower than from aviation in general, but activities such as ground transport and building operations require decarbonising.

Green investments in the aviation sector could include improving efficiency, scaling up sustainable aviation fuels, and commercialising alternative propulsion technologies. Efficiency is necessary for planes and fleets as well as through air traffic and route optimisation but is inadequate to decarbonise the sector. Sustainable aviation fuels such as biofuels, synthetic fuels, green hydrogen, or renewable electrification, should achieve lifecycle emissions reductions benefits compared to fossil jet fuel while avoiding harmful environmental and social impacts. Offsets vary in quality and are insufficient to align the aviation sector with the goals of the Paris Agreement.

Engagement among airlines, airport operators, aircraft and fuel suppliers, policymakers, researchers, and other stakeholders is an essential component of an aviation sector climate strategy. The changes required to align the aviation sector with a low-carbon, climate resilient future are too significant and costly for individual companies to succeed on their own. Meaningful action, investment, R&D, and collaboration need to accelerate now for the sector to achieve net zero by 2050.

⁶ The Contribution of Global Aviation to Anthropogenic Climate Forcing for 2000 to 2018 | Atmospheric Environment (sciencedirect.com), Reducing Emissions from Aviation | EU Commission Climate Action (ec.europa.eu/clima)

⁷ The Contribution of Global Aviation to Anthropogenic Climate Forcing for 2000 to 2018 | Atmospheric Environment (sciencedirect.com)

⁸ Net Zero by 2050 - A Roadmap for the Global Energy Sector | IEA (iea.org)









3 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the client's framework dated August 2022. 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.

'Shades of Green' methodology

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:

Shading	Examples
 Dark Green is allocated to projects and solutions that correspond to the long-term vision of a low-carbon and climate resilient future.	 Solar power plants
 Medium Green is allocated to projects and solutions that represent significant steps towards the long-term vision but are not quite there yet.	 Energy efficient buildings
 Light Green is allocated to transition activities that do not lock in emissions. These projects reduce emissions or have other environmental benefits in the near term rather than representing low carbon and climate resilient long-term solutions.	 Hybrid road vehicles

The "Shades of Green" methodology considers the strengths, weaknesses and pitfalls of the project categories and their criteria. 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, including potential macro-level impacts of investment projects.

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, key governance aspects that can influence the implementation of the green bond are carefully considered and reflected in the overall shading. CICERO Green considers four factors in its review of the client's governance processes: 1) the policies and goals of relevance to the green bond 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. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.



Assessment of alignment with Green Bond Principles

CICERO Green assesses alignment with the International Capital Markets' Association's (ICMA) Green Bond Principles. We review whether the framework is in line with the four core components of the GBP (use of proceeds, selection, management of proceeds and reporting). We assess whether project categories have clear environmental benefits with defined eligibility criteria. The Green Bonds Principles (GBP) state that the "overall environmental profile" of a project should be assessed. 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 selection process. CICERO Green assesses whether net proceeds or an equivalent amount are tracked by the issuer in an appropriate manner and provides transparency on the intended types of temporary placement for unallocated proceeds. Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs.



Appendix 1: Referenced Documents List

Document Number	Document Name	Description
1	Swedavia Airports Green Finance Framework	Swedavia's green finance framework dated August 2022
2	Swedavia Green Bond Impact Report 2021	Swedavia's green finance allocation and impact reporting for 2021
3	Swedavia Airports Annual and Sustainability Report 2021	Swedavia's annual and sustainability reporting for 2021
4	Swedavia Airports Code of Conduct	Swedavia's code of conduct dated April 2022
5	Environmental and Energy Policy	Swedavia's environmental and energy policy dated April 2021
6	Roadmaps For Fossil Free Competitiveness: Follow-Up 2021	Fossil Free Sweden's 2021 update on sector roadmaps for decarbonisation
7	Fossilfritt Sverige: Aviation Industry	Fossil Free Sweden's aviation industry decarbonization roadmap
8	Vägen Till Fossilfritt Flyg 2045 Agerande, Hinder och Behov	The Route to Fossil-Free Flight 2045: Action, Obstacles and Behaviour report from RISE, Swedavia Airports, SAS, and the Swedish Energy Agency (Energimyndigheten) dated January 2021



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, the International Institute for Sustainable Development (IISD) and the School for Environment and Sustainability (SEAS) at the University of Michigan.



- ★ **2021 Largest External Reviewer**, Climate Bonds Initiative Awards
- ★ **2020 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2020 Largest External Review Provider In Number Of Deals**, Climate Bonds Initiative Awards
- ★ **2019 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2019 Largest Green Bond SPO Provider**, Climate Bonds Initiative Awards
- ★ **2018 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2018 Largest External Reviewer**, Climate Bonds Initiative Awards
- ★ **2017 Best External Assessment Provider**, Environmental Finance Green Bond Awards
- ★ **2016 Most Second Opinions**, Climate Bonds Initiative Awards