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Second Party Opinion

HASI Green Bond Framework

June 13, 2024

Location: United States Sector: Financial Institutions

Alignment With Principles

Aligned = 🗸

Conceptually aligned = O

Not aligned = 🗶

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

✓ Green Loan Principles, LMA/LSTA/APLMA, 2023

See Alignment Assessment for more detail.

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

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

Strengths

Hannon Armstrong Sustainable Investing (HASI) has a mandate to only invest in projects with a climate-positive or climate-neutral impact and other environmental benefits. The mandate provides safeguards that prevent investor money from financing projects that increase residual carbon emissions, per HASI's CarbonCount methodology.

It will use proceeds allocated to clean transportation to convert internal combustion engine buses to electric. This is a necessary technology that supports the decarbonization of transportation, particularly public transportation, and promotes a circular economy. We expect full conversion of financed fleets by 2027.

Weaknesses

HASI has provided limited details surrounding environmental screening of the supply chain or downstream end-of-life management of financed renewable energy and battery storage projects. Upstream supply chain considerations are especially important for battery storage since critical minerals may be sourced from countries with lower environmental regulatory standards.

Areas to watch

Convertible bonds may be issued under HASI's framework. They potentially pose a challenge for allocation reporting if the period of allocation extends past conversion. However, because of the 24-month allocation period, this challenge may not materialize if converted after the second year. In addition, because of HASI's mandate to invest in projects with positive climate or other environmental benefits, any conversion of debt to equity would still fund such projects.

CarbonCount does not account for life cycle carbon emissions. It only accounts for operational avoided carbon emissions. As a result, embodied project emissions may not be accurately captured. This is a limitation of the calculation methodology.

Eligible Green Projects Assessment Summary

Eligible projects under the issuer's green finance framework are assessed based on their environmental benefits and risks, using Shades of Green methodology.

Renewable Energy

Dark green

Projects entail specified Grid-Connected Generation and Storage projects, as well as Behind-The-Meter (BTM) Distributed Generation and Storage projects. Eligible projects include onshore and offshore wind, solar and solar-plus-storage, and standalone storage. Eligible BTM under this category include commercial and industrial solar and solar-plus storage, community solar and solar-plus-storage, and residential solar and solar-plus storage.

Energy Efficiency

Medium green

Projects entail BTM distributed building or facility projects in both the public and private sectors that reduce energy usage and/or cost through energy efficient improvements, including heating, ventilation, and air conditioning (HVAC), lighting, energy controls, roofs, windows, and building shells.

Pollution Prevention and Control

Medium green

Projects entail renewable natural gas (RNG) projects including anaerobic digestion food waste to RNG, landfill gas (LFG)-to-RNG, and wastewater treatment biogas (WWTPB)-to-RNG.

Clean Transportation

Dark green

Projects include transportation fleet decarbonization and optimization.

Terrestrial and aquatic biodiversity

Dark green

Projects include ecological restoration projects designed for wetland protection and protected species habitat creation and restoration.

Sustainable water and wastewater management

Medium green

Ecological restoration projects designed to improve water quality, mitigate pollution runoff into downstream waterways, improve the ecology of freshwater streams and improve flood control infrastructure.

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

Hannon Armstrong Sustainable Investing (HASI), based in Annapolis, Md., is an investment firm with a mandate to only invest in climate-positive real assets and technologies that facilitate the energy transition. As of December 2023, HASI reported approximately \$6.2 billion in its investment portfolio. Its portfolio targets key markets including BTM assets (48%) such as energy efficiency, residential solar, and community solar; grid-connected assets (38%) including wind, solar and storage; and fuels, transport and nature (14%) involving renewable natural gas, fleet decarbonization, and ecological restoration. HASI invests via a variety of methods, including equity, joint ventures, real estate, and commercial and government receivables. HASI also provides securitization transactions, advisory services, and asset management, for which it collects fees.

Material Sustainability Factors

Climate Transition Risk

Asset managers are exposed to the climate transition risk of the sectors they finance, namely power, transportation, and real estate. Power generators represent the largest direct source of greenhouse gas emissions globally, making this sector highly susceptible to increasing public, political, legal, and regulatory pressure to accelerate climate goals. Over the past decade, asset managers have faced multibillion-dollar impairments for most polluting assets, reflecting their weaker economics as taxes increase, and are displaced by new, cleaner technologies that have become more mature and cost competitive. The transportation sector is the fastest-expanding source of emissions worldwide. Regulations on fuel efficiency, powertrains, or emissions have begun emerging in some markets and may further tighten to address climate goals. Increased energy use in buildings has also been a major contributor to climate change. Building occupiers and operators may face higher energy bills as power prices rise and higher capital expenditure as upgrades are required to accommodate the energy transition and meet more stringent efficiency standards. Meanwhile, low-carbon properties may achieve higher cost efficiencies or attract premium rents in the longer term, therefore enhancing their value.

Physical Climate Risk

Asset managers finance a wide array of business sectors exposed to physical climate risks. Events are typically localized, so the magnitude of exposure is linked to the sites of activities and assets. We expect these dynamics to continue but vary regionally depending on regulatory responses. Power generators and real estate developers have fixed assets, leaving them relatively more exposed to physical climate risks than other sectors. For stakeholders, extreme weather (including wildfires, hurricanes, and storms) is becoming more frequent and severe and can result in power outages for large populations. Coupled with regulatory pressure to preserve security of supply, these drive players to enhance their assets' resilience. Physical climate risks generally involve significant financial losses for power operators due to repairs and reduced output, as well as exposure to extreme spikes in prices or claims due to business disruption. For real estate operators, extreme weather events pose a risk to human health and safety and rising building insurance premiums. In extreme cases, they may even require tenant relocation.

Biodiversity and Resource Use

Asset managers contribute to significant resource use and biodiversity impact through the activities they fund or invest in. Renewable power, while expanding to meet climate goals, often requires large land areas in sensitive habitats where they can alter ecosystems, harm threatened species, and compete with other valuable land uses (e.g., agriculture). The energy transition

also relies on critical raw materials, the mining of which may entail land use change and biodiversity loss. Awareness over the link between biodiversity and global productivity is increasing and is a material risk for power generators and, in turn, their investors.

Impact on Communities

Asset managers are exposed to community-related risks via the activities they finance. Power generators face community scrutiny over determining the site of assets and waste and pollution generated by assets. While renewable power does not generate harmful air or water pollutants, sites with high renewable potential are often in or near communities, including indigenous groups. Sites of renewable energy projects can prompt strong local opposition if the needs of stakeholders are not adequately considered. Community opposition, including the subsequent loss of social license to operate, has stalled and cancelled renewable energy projects in the past. Meanwhile, the transportation sector indirectly affects communities. Tailpipe emissions of air pollutants can harm human physical health in high enough concentrations.

Issuer And Context Analysis

The framework's eligible project categories aim to address climate transition risk, physical climate risk, and biodiversity and resource use, which we view as the most relevant sustainability factors for HASI. In our view, impact on communities is a relevant consideration because community pushback is a material risk, especially for renewable development.

HASI's investment mandate ensures all projects it finances pass a screen for overall environmental impact, including a climate-positive benefit, water savings, or other environmental benefits. In our view, this investment approach ensures that all projects support environmental objectives. HASI's priority is climate-positive projects, which it evaluates using its proprietary CarbonCount ratio of the annual avoided metric tons of carbon dioxide equivalent to the capital invested per project. HASI utilizes CarbonCount for all projects to ensure that all projects are at a minimum carbon neutral, but requires projects with a climate focus to be CarbonCount positive. HASI calculates this by using estimates of the annual hourly generation avoided by the project and locational marginal emissions factors. However, it does not include life cycle emissions, which is a limitation of the approach, in our view. We note HASI finances some fossil fuel assets but exclude them from the framework. HASI has committed to achieve net-zero Scope 1, 2, and 3 greenhouse gas emissions by 2050. As an asset manager, HASI does not have significant direct such emissions, but it does track and report its Scope 3 emissions, including those of its investments. It set a net-zero target for its Scope 3 emissions in 2023 but has yet to have them verified by the Science Based Targets initiative.

HASI assesses the physical climate risk posed to its portfolio via scenario analysis and its due diligence processes. HASI's portfolio is exposed to physical climate risks such as intensifying storms, extreme weather events, wildfires, and rising sea level. HASI has conducted scenario analysis under 1.5 degrees Celsius (1.5 C) and above 2 C warming scenarios for the 2050 and 2100 time horizons. HASI uses the scenario analyses to better understand how physical risk affects operational performance of and cash flow from financed renewable assets. While HASI conducts scenario analysis at the portfolio level, it also considers and mitigates physical climate risk at the project level via its due diligence process, principally through independent engineering and weather analyses and insurance reviews.

HASI evaluates and mitigates the impact of financed renewable energy projects on local biodiversity, and it commits to supporting biodiversity via its financed ecological restoration projects. HASI ensures its project development partners perform environmental site assessments and local wildlife studies as part of the permitting process as per regulatory requirements. For instance, financed wind projects are located to minimize impact on bird and bat species, and some in migratory routes must pause rotation during migration periods. These practices are codified under HASI's biodiversity policy. HASI also finances projects that protect biodiversity and restore degraded natural habitat.

HASI has adopted an organizational climate justice statement and some of its financed projects may indirectly provide benefits to local communities. HASI's statement acknowledges that marginalized and vulnerable communities are disproportionately affected by climate change and other environmental issues. In the 2024 impact report, HASI committed to incorporating climate justice principles across its process for underwriting investments and engagement with business partners. However, it is unclear how it incorporates these principles into underwriting procedures. Additionally, HASI's financed ecological restoration and pollution prevention projects can also improve quality of life for local communities via cleaner air and waterways, enhanced flood resiliency, and improved recreational spaces. HASI is also exploring methods to measure the social impact of its investments.

Alignment Assessment

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

Alignment With Principles

Aligned = 🗸

Conceptually aligned = O

Not aligned = X

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

✓ Green Loan Principles, LMA/LSTA/APLMA, 2023

✓ Use of proceeds

All the framework's green project categories are shaded green and considered aligned. HASI commits to allocate the net proceeds issued under the framework exclusively to new or existing eligible green projects. The maximum look-back period for refinanced projects is 12 months, well within market practice. Refer to the Analysis of Eligible Projects section for more information on our analysis of the environmental benefits of the expected use of proceeds.

✓ Process for project evaluation and selection

HASI's investment team has primary responsibility on evaluating new investments and ensuring they fit within the eligible categories. The investment committee comprises three voting members (CEO, CFO, head of portfolio management) and four nonvoting members from the leadership team. They all are experienced and tenured in assessing and managing projects and investments relevant to target investment markets. The process for new investments includes engaging with the portfolio management, legal, accounting, and technology teams across the organization. When HASI identifies a new opportunity, the approval process requires three levels of screening based on eligibility criteria. One such criterion is that investments must result in positive residual emissions avoided per dollar investment, calculated using CarbonCount. We view the use of quantitative thresholds in eligibility criteria positively. Finally, HASI has processes and practices in place to identify, manage, and mitigate perceived environmental and social risks.

✓ Management of proceeds

The net proceeds will be deposited into HASI's general account and earmarked for allocation to projects within two years. HASI's treasury team will oversee and track the allocation of funds. The company commits to replacing projects, which cease to be eligible within 12 months following their removal from the invested pool. Pending allocation, proceeds will be held in cash or cash equivalent instruments or used to repay indebtedness, in accordance with HASI's treasury policy.

✓ Reporting

HASI will publish annual updates until net proceeds have been fully allocated. Management asserts that an amount equal to the net proceeds from this financing was allocated to qualifying green projects, and a report from an independent accountant will accompany the updates. Allocation reporting will include a brief description of financed projects on an anonymized basis. Impact reporting will include information such as avoided emissions, a qualitative summary of biodiversity benefits, and avoided water consumption. HASI also intends to report on the geography, market, and technology of projects that receive allocation. HASI commits to third-party verification of its allocation and impact reporting post-issuance, which adds to the invested projects' transparency. We note that convertible bonds may be issued under the framework. Convertible bonds potentially pose a challenge for allocation reporting if the period of allocation extends past conversion. However, because of the 24-month allocation period, this challenge may not materialize if conversion occurs after the second year.

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.

HASI does not provide the expected share of the allocation of proceeds to the various project categories. It expects the share to vary issuance-by-issuance.

Overall Shades of Green assessment

Based on HASI's past allocation of proceeds to these categories and consideration of environmental ambitions reflected in its Green Bond Framework, we assess the framework 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



Eligible grid-connected projects include onshore and offshore wind, solar and solar-plusstorage, and stand-alone storage. Eligible BTM under this category include commercial and industrial solar and solar-plus storage, community solar and solar-plus-storage, and residential solar and solar-plus storage.

- Renewable energy projects such as onshore and offshore wind and solar are key elements in the transition to low carbon transition, and these projects support a low carbon climate resilient (LCCR) future. Further, energy storage systems facilitate grid stability from intermittent renewable resources. As a result, we have shaded investments in this category as dark green.
- We note that the stand-alone storage projects connected to the electricity grid will charge and discharge on grids that are not
 always 100% renewable energy. However, these types of projects still provide residual greenhouse gas emissions reductions
 benefits as they typically charge during times of high renewables output. Additionally, we expect stand-alone projects to be in
 the U.S., where grids are decreasing in carbon intensity due to more penetration of renewable resources and retirement of coalfired power plants.
- HASI's managed assets span 48 of the 50 U.S. states, exposing the portfolio to physical climate risk. HASI uses its due diligence processes for physical climate risk management, including independent engineering and weather analysis and insurance reviews, which help mitigate risk.
- According to HASI, all renewable energy projects are subject to environmental screening considerations as part of due diligence, including environmental permits or impact assessments, hydrology reports, and species impact reports. We consider these measures to be adequate in addressing local environmental impact.
- HASI does not disclose its approach to mitigate upstream and downstream environmental risks. These risks are especially
 relevant for technologies such as battery storage, which has a supply chain highly exposed to deforestation risk outside of the
 U.S. We also lack information on end-of-life management of financed solar photovoltaic panels, wind turbines, and battery
 storage systems.

Energy Efficiency

Assessment

Description

Medium green

Energy efficiency projects entail BTM distributed building or facility projects in both the public and private sectors that reduce energy usage and/or cost through energy efficient improvements, including HVAC, lighting, energy controls, roofs, windows, and building shells.

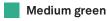
Analytical considerations

- Energy efficiency in buildings is an important consideration for the low-carbon transition for the building sector. HASI's framework lists classical energy efficiency measures that support improved efficiencies in buildings and contribute to emissions savings.
- The impact of each energy efficiency project is quantified via CarbonCount. The minimum threshold that projects must attain to be eligible for financing is >0 mt CO2-eq/\$1,000 invested. CarbonCount has also been independently verified, which provides additional assurance. However, CarbonCount excludes life cycle emissions and embedded emissions associated with materials. We do not consider this threshold to be ambitious as primary energy demand threshold, and as a result, we have shaded these investments medium green.
- HASI receives annual measurement and verification reports of energy use after installation. If it does not meet certain energy and cost-saving thresholds, typically the energy service company performs additional efficiency upgrades. These represent adequate measures to monitor and mitigate rebound risk, the risk in which energy efficiency upgrades increase energy use that negates the savings budget.
- For all buildings, mitigating the exposure to physical climate risks is key to making the financed assets more climate resilient. Physical climate risk of projects financed under this category are assessed as part of investment due diligence.
- HASI has stated that no direct investments in fossil fuel-based heating, including appliance upgrades to gas-fired boilers or furnaces, will be made under the framework.

Pollution Prevention and Control

Assessment

Description



Pollution prevention and control projects entail RNG projects including anaerobic digestion food waste to RNG, LFG-to-RNG, and WWTPB-to-RNG.

- Bioenergy is a considered a renewable energy source, especially when the feedstock is waste from other industrial processes such as forestry or agriculture. Biomethane or RNG is a pipeline-quality gas fully interchangeable with conventional natural gas. As a result, biomethane could help decarbonize the transportation sector. We expect RNG production financed by HASI to be used for transportation.
- HASI only finances projects that produce biomethane via anaerobic digestion of agricultural or animal waste, LFG-to-RNG, and WWTPB-to-RNG, which mitigates land use change risks associated with other feedstocks and promotes a circular economy. We expect any LFG-to-RNG plants financed under the framework will be at existing plants. Additionally, it centers these projects around feedstocks, which minimizes the emissions associated with the transportation of feedstock to the production facility.
- Most RNG projects are not required to undergo certification by third-party auditors. However, projects must maintain detailed records and documentation of feedstock sourcing, emissions calculations, and other relevant information. Given the detailed record collection in combination with the commitment to only finance projects using waste-based feedstock, we believe HASI has given sufficient consideration toward value chain sustainability.
- There are no explicit rules or criteria surrounding biomethane leakage for the financed projects, which introduces risks related to the release of a potent greenhouse gas.
- Because not all RNG projects are required to obtain third party certification and there are no safeguards for biomethane leakage, we assess investments in this category as medium green.

Clean Transportation

Assessment Description

Dark green Clean transportation projects include fleet decarbonization and optimization.

Analytical considerations

- Zero-carbon vehicles such as electric and hydrogen fuel cell vehicles are important technologies to decarbonize transportation.
 Converting internal combustion engine vehicles to electric of fuel cell displaces tailpipe greenhouse gasses and other air pollutant emissions.
- HASI expects to allocate proceeds under this category to Zum, a rideshare service provider exclusively focused on school bus
 fleets. Zum will use proceeds from HASI to acquire diesel and propane powered buses. It plans to first install software that
 optimizes bus routes which reduces tailpipe emissions in the near term, before fully converting the entire fleets to electric by
 2027.
- While we do not consider route optimization software and/or investments that improve the fuel efficiency of internal combustion engine buses alone to represent long-term decarbonization in North America, these measures in combination with the phased conversion to electric vehicles by 2027 are important steps toward decarbonization of a hard-to-abate vehicle type. Because proceeds lent by HASI will be used to ultimately electrify the fleets by 2027, we assess this category as dark green.

Terrestrial and aquatic biodiversity

Assessment Description



Terrestrial and aquatic biodiversity projects include ecological restoration projects designed for wetland protection and protected species habitat creation and restoration.

- We consider projects that restore the health of ecosystems an important part of a sustainable future. Wetlands, especially, are vital to increasing the climate resiliency and improving water quality and biodiversity. They also offer important ecosystem benefits and support broader environmental outcomes. As a result, we assess this category as dark green.
- HASI's financed projects represent nature-based solutions (NbS), which leverage the sustainable management of resources and ecosystem restoration to address societal challenges. HASI expects financed NbS projects to be in the U.S. An example is the conversion of 3,200 acres of arid farmland to wetland habitat in Northern California, which protects several threatened and endangered species and assists the area in complying with the U.S. Endangered Species Act.
- Increasing regional resiliency to physical climate risk is not a primary goal of such projects, but it is often an ancillary benefit. The project also entails rebuilding and relocating earthen levees, digging new tidal waterways, and revegetating arid land. These actions increase the resiliency of the region to severe rainstorms and floods.
- HASI requires all investments under this category to meet its minimum CarbonCount threshold for non-climate focused projects. Financed projects must at minimum be carbon-neutral and provide local biodiversity benefits.

Sustainable water and wastewater management

Assessment

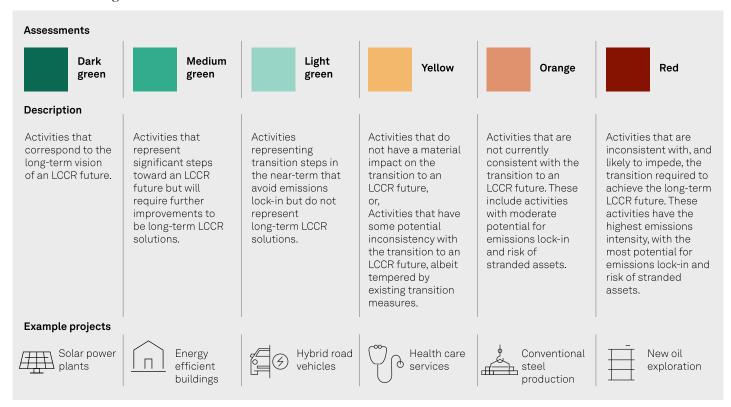
Description



Ecological restoration projects designed to improve water quality, mitigate pollution runoff into downstream waterways, improve the ecology of freshwater streams and improve flood control infrastructure.

- Wetland restoration projects financed under this category are undertaken for the purposes of creating mitigation credits in the U.S. Under Section 404 of the Clean Water Act, developers are required to compensate for the destruction of wetlands by restoring, creating, or enhancing wetlands elsewhere. One method of compensation is purchasing wetland mitigation credits from a mitigation bank. The mitigation credits are regulated and approved by the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA).
- HASI will invest in wetland mitigation banks whereby wetland restoration projects offer mitigation credits that may be claimed by developer. HASI is not involved in financing of development projects that require the purchase of mitigation credits.
- HASI also finances stream restoration projects in the Chesapeake Bay region that generate stormwater and water quality credits. These projects slow sediment runoff and increase filtration prior to entering the Chesapeake Bay. The Maryland EPA oversees this program, and local counties and public agencies purchase credits.
- While such projects offer important environmental benefits by restoring ecosystems, these benefits are offset by the claiming of these credits for developments that adversely impact ecosystems. We therefore assess this category as medium green.

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).

Mapping To The U.N.'s Sustainable Development Goals

Where the financing documentation references the Sustainable Development Goals (SDG), we consider which SDGs it contributes to. We compare the activities funded by the financing to the International Capital Markets Association SDG mapping and outline the intended linkages within our SPO analysis. Our assessment of SDG mapping does not impact our alignment opinion.

This framework intends to contribute to the following SDGs:

Use of proceeds

SDGs

Renewable Energy





7. Affordable and clean energy

9. Industry, innovation and infrastructure

Energy Efficiency



7. Affordable and clean energy

Pollution Prevention and Control



12. Responsible consumption and production

Clean Transportation



11. Sustainable cities and communities

Terrestrial and aquatic biodiversity





14. Life below water

15. Life on land

Sustainable water and wastewater management



6. Clean water and sanitation

Related Research

- Analytical Approach: Second Party Opinions: Use of Proceeds, July 27, 2023
- FAQ: Applying Our Integrated Analytical Approach for Use-of-Proceeds Second Party Opinions, July 27, 2023
- Analytical Approach: Shades of Green Assessments, July 27, 2023

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