S&P Global Ratings

Powered by Shades of Green

Second Party Opinion

Housing & Development Board Green Bonds

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Primary contact

Shirley Lui
Hong Kong
+852-2912-3063
shirley.lui@spglobal.com

Location: Singapore **Sector:** Real Estate

Alignment With Principles

Aligned = ✓ Conceptually aligned = O Not aligned = ✕

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

✓ Asean Capital Markets Forum Green Bond Standards

See Alignment Assessment for more detail.

Light green

Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term low-carbon climate resilient solutions.

Our Shades of Green Analytical Approach >

Strengths

As the largest master planner and housing developer in Singapore, public housing authority Housing & Development Board (HDB) provides affordable public housing in the country. In addition to providing a diverse range of housing options with new flats priced below market rates, HDB also offers mortgage financing loans at reduced interest rates and subsidized rental flat for lower-income individuals and those requiring housing assistance.

Weaknesses

No weaknesses to report.

Areas to watch

HDB is in the early stages of measuring its carbon footprint and has yet to disclose greenhouse gas emissions reduction targets. HDB aims to align with the Government of Singapore's reporting and target, and intends to publish the sustainability report at the end of 2024.

Green buildings certifications do not necessarily offer a complete assessment of a building's environmental performance throughout its lifecycle such as embodied emissions and physical climate risks. However, HDB focuses on the top two tiers of the Building and Construction Authority (BCA) certification, which has a prerequisite requirement on energy savings.

Eligible Green Projects Assessment Summary

HDB issued green bonds of Singapore dollar (S$) 740 million on Nov. 24, 2023, and S$800 million on Jan. 23, 2024. Net proceeds were solely invested in green buildings, with 60% allocated to new financing and 40% to refinancing.

In 2022, HDB had issued three green bonds totaling S$3.3 billion following the development of its green finance framework in January 2022. See related SPO here.

Overall Shades of Green assessment

Based on the project category shades of green detailed below, and consideration of environmental ambitions reflected in HDB's Green bonds, we assess the framework Light green.

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

Light green

Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term low-carbon climate resilient solutions.

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Green Buildings	Light green
For new public housing developments: • Obtain BCA Green Mark Gold Plus or higher • Provide smart lighting for indoor and outdoor common areas • Provide regenerative lifts for all residential blocks • Provide solar-ready roofs	

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

HDB is a public housing authority that plans and develops housing estates in Singapore. It offers commercial, recreational, and social amenities in the housing estates. The institution specializes in the sale and rental of residential flats; upgrading and redevelopment of older estates; and provision of mortgage loans to the purchasers of flats under public housing schemes.

The institution was established in 1960 by the Singapore government.

Material Sustainability Factors

Physical Climate Risk

Real estate assets are exposed to physical climate risks. While varying by location, these could include acute risks--such as wildfires, floods, and storms--which are becoming more frequent and severe, as well as chronic risks--such as long-term changes in temperature and precipitation patterns and sea levels. Acute and chronic risks could damage properties or place tenant health and safety at risk, as well as require investments to manage potential effects or, in severe cases, relocation of tenants. While aggregate impact is moderate—since the type, number, and magnitude of these risks varies by region—highly exposed regions may be subject to material physical climate risk exposure. Most participants have some insurance coverage, but it could become more difficult to secure insurance for the most exposed assets in the future, absent adaptation. According to the World Bank, Singapore is vulnerable to the consequences of climate change, such as rising sea levels, intense rainfall, dry spells, and other extreme weather events.

Climate Transition Risk

Increased energy use in buildings has been a major contributor to climate change, representing around a third of global greenhouse gas emissions on a final-energy-use basis, according to the International Energy Agency (IEA). This leaves the sector highly susceptible to the growing public, political, legal, and regulatory pressure to accelerate climate goals. Building occupiers and operators may face higher energy bills as power prices rise, and higher capital expenditures as upgrades are required to accommodate the energy transition and meet more stringent efficiency standards. This could affect household purchasing power and the competitive strengths of commercial and industrial properties. Incremental climate-related investments can require significant capital outlays but will potentially reduce the risk of obsolescence due to changes in regulation or climate goals. In addition, low-carbon properties may achieve higher cost efficiencies or attract premium rents in the longer term, therefore enhancing their value. In 2021, five government ministries launched the Singapore Green Plan 2030, in which the country aims to install 1.5 gigawatt-peak (GWp) of solar power as well as 200 megawatt-hour (MWh) energy storage systems by 2025 to support the transition to clean energy.

Access & Affordability

Low housing stock and lack of affordable options can severely influence people’s livelihoods, especially the vulnerable, low-income segment of the population. Access and affordability are especially important for residential tenants where rents can account for a large portion of incomes. Lack of accessibility and affordability of commercial properties can also hinder the sustainable growth of local communities. According to the 2023 Asia-Pacific Home Attainability Index report released by the Urban Land Institute, the affordability ratio of median property price to median annual income in Singapore is 13.7x for private property and 4.5x to 4.7x for public housing (indicating it would take 4.5 to 4.7 years of income, making public housing more affordable than private property).

Impact On Communities

Properties, and by extension their owners, are inherently part of communities in which they are located because they provide an essential service and can shape neighborhoods both economically and socially. The residential sector is particularly impactful on communities, where gentrification pressures can alter communities' social fabric and can be challenging to remediate. Hotels, retail, and offices draw an influx of people into a community, which can support the local economy but can also affect community dynamics. Real estate institutions such as HDB, which houses about 80% of Singapore's resident population, have a vital role in creating and building sustainable and thriving communities.

Issuer And Context Analysis

Green buildings address HDB's most material sustainability factors. This project category in the financing framework aims to contribute to climate transition risk, and indirectly to factors such as access and affordability and impact on communities. On the other hand, physical climate risks are relevant as HDB's assets in Singapore are exposed to rising sea levels, intense rainfall, and dry spells.

HDB is in the early stages of measuring its carbon footprint and has yet to disclose greenhouse gas emissions reduction targets. HDB is monitoring its carbon footprint and aims to align with the Government of Singapore's reporting and targets. The issuer intends to publish its sustainability report at the end of 2024, which will disclose details on emissions sources, climate-related initiatives and targets. Nevertheless, HDB has been implementing energy efficient measures into its projects, such as the use of smart LED lighting, lifts with regenerative features, integration of greenery, and installation of solar panels.

HDB incorporates physical climate risk mitigation in its property project planning. HDB is working with the Resilience Working Group (RWG) in studying Singapore's climate change vulnerability and developing long-term resilience plans. At the same time, it ensures that its projects comply with regulations from Public Utilities Board (PUB), Singapore's National Water Agency and National Environment Agency (NEA) to mitigate flooding risks and control greenhouse gas emissions, demonstrating their commitment to climate change and extreme weather. However, HDB is not conducting climate scenario analysis to identify physical risks at each property.

HDB provides a diverse range of housing options, with new flats priced at below market rates to maintain affordability, making them less expensive than comparable resale flats. As the largest master planner and housing developer in Singapore, HDB also offers mortgage financing loans at reduced interest rates and offers heavily subsidized rental flat for lower-income individuals and those requiring housing assistance. Additionally, HDB provides financial calculators, allowing customers to review their finances and determine how much they can allocate each month for housing loan repayments and expenses before searching for a flat.

HDB's commitment to sustainable building practices ensures limited disruption to the environment and local communities. The issuer sets up regular meetings with stakeholders, such as residents, and formulates appropriate and necessary actions to address any raised concerns. HDB, in collaboration with Urban Redevelopment Authority (URA) and National Parks Board (NParks), assesses land use changes for new buildings. This process ensures a balance between development needs and preserving biodiversity. HDB conducts an Environmental Impact Assessment (EIA) and may require more detailed environmental studies for developments near sensitive nature areas.

Alignment Assessment

This section provides an analysis of the green bonds' alignment to Green Bond principles.

Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✕

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

✓ Asean Capital Markets Forum Green Bond Standards

✓ Use of proceeds

The framework's green building project category is shaded in green, and the issuer commits to allocating the net proceeds issued under the framework exclusively to eligible green projects. Please refer to the Analysis Of Eligible Projects section for more information on our analysis of the environmental benefits of the expected use of proceeds. HDB discloses the proportion of financing versus refinancing in its allocation reporting. The look-back period is two years, better than the market practice of three years.

✓ Process for project evaluation and selection

HDB's Design Development Group (part of the former Development and Procurement Group) is responsible for identifying the list of eligible projects according to the criteria specified in the framework. The list of projects needs to be endorsed by the Deputy Chief Executive Officer (Building) to be included in the Green Project Register. The Board's Finance Group presents, on an annual basis, the register to the Chief Executive Officer for review and approval. HDB conducts environmental studies to identify and manage potential environmental and social impacts arising from building development, such as construction noise, water pollution, health, and welfare of the workers.

✓ Management of proceeds

HDB's Finance Group has an internal Green Project Register to keep track of the proceeds from the green financing transactions. The issuer commits to periodically adjust the balance of the tracked proceeds to match allocations to the eligible projects on a portfolio basis. It has not needed to do it so far, as all invested projects have preserved their eligibility. Pending allocation, net proceeds are managed as part of HDB's cash management process, which includes short-term balances. Short-term balances may be held by the Accountant-General's Department under the government of Singapore's Centralised Liquidity Management Framework for Statutory Board.

✓ Reporting

HDB has produced annually both allocation and impact reporting, and commits to do so until the full allocation of net proceeds and in case of material developments. The issuer publishes a green finance report for green bonds on its website. Reports include information such as allocated and unallocated amount, share of financing and refinancing for each bond, brief descriptions of financed projects, and the expected environmental impacts.

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.

Green project categories

Green Buildings	
Assessment	**Description**
Light green	For new public housing developments (include residential and nonresidential HDB projects): • Obtain BCA Green Mark Gold^{Plus} or higher • Provide smart lighting for indoor and outdoor common areas • Provide regenerative lifts for all residential blocks • Provide solar-ready roofs

Analytical considerations

- Green buildings support climate change mitigation by potentially alleviating greenhouse gas emissions. The IEA emphasizes that reaching net-zero emissions in buildings demands major energy efficiency strides and fossil fuel abandonment. All properties must achieve high energy performance. New properties should additionally cut emissions from building materials and construction. In addition, addressing physical climate risks is crucial for strengthening climate resilience across all buildings.
- HDB allocates the proceeds to finance or refinance the development of new residential and nonresidential projects (such as commercial neighborhood center similar to Northshore Plaza I & II and Kampung Admiralty). All projects must achieve BCA certification of Green Mark Gold^{Plus} or above to be eligible. It is positive that HDB focuses on the top two tiers of the BCA certification, which has prerequisite requirements on energy savings that go beyond local building codes. Nevertheless, the certification's point-based system implies that the targeted certification could be achieved without thoroughly addressing other environmental aspects such as embodied emissions and physical climate risks. Moreover, while there are existing energy saving examples for smart lighting and regenerative lifts, the issuer has not set performance thresholds, limiting the insight of the spending's potential impacts. We thus assign the project category a Light green shade.
- Buildings are exposed to physical climate risks, including rising sea levels, flooding, and increased rainfall in Singapore. HDB ensures buildings complies with codes set by the Public Utilities Board, which is also Singapore's national water authority, to manage potential physical climate risks. While HDB is working with the RWG on developing long-term resilience plans to mitigate nationwide climate-related risks, the issuer itself does not separately analyze nor conduct climate-related scenario analysis.
- Heating and cooling of HDB's buildings is primarily sourced from the regional power grids with partial contribution from solar energy. This means the actual emissions will depend on the country's electricity grid energy profile. Currently, Singapore's power grids are still largely dependent on fossil fuels, with about 95% of electricity generated using imported natural gas, with a national objective of using 30% of low-carbon electricity by 2035. HDB shared that fossil fuel-based generators will be used for emergency purposes only, and HDB is seeking alternative solutions such as battery packs.
- Construction of new building requires raw materials with considerable embodied emissions and associated climate impacts. HDB is exploring the use of green and low embodied carbon materials in construction, yet specific details regarding the building's lifecycle emissions are not available at this stage. HDB mainly relies on BCA's certification of Green Mark to address the buildings' environmental impact, such as material sourcing, water, and waste management.
- Risks on biodiversity and land use change is controlled because HDB will work with URA and NParks to evaluate new building constructions as developments take place in largely urbanized areas. Environmental studies are required for developments

near key biodiversity areas or greenfield sites. If construction proceeds after balancing the government's development needs and retaining natural areas, detailed studies will be conducted to minimize environmental impacts.

- HDB utilizes smart lighting and regenerative lifts in its ongoing building projects to reduce energy use. The issuer shared that smart lighting could achieve up to 60% energy savings, compared with conventional lighting, with the incorporation of motion sensors and smart analytics to reduce lighting in areas with lower traffic. Regenerative lifts have the potential to reduce energy consumption by an average of 20% through reusing the energy generated during lift motions and braking.
- For solar-ready roofs, financed projects may include optimizing the available roof space for solar panel installation and maintenance, providing support structure for the placement of solar panels, as well as provisioning electrical infrastructure for future wiring connection.

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

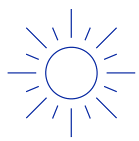
Note: For us to consider use of proceeds aligned with ICMA Principles for a green project, we require project categories directly funded by the financing to be assigned one of the three green Shades.

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).

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

Where the Financing documentation references the Sustainable Development Goals (SDGs), we consider which SDGs it contributes to. We compare the activities funded by the Financing to the International Capital Markets Association (ICMA) 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
Green buildings	 **7. Affordable and clean energy**

*The eligible project categories link to these SDGs in the ICMA mapping.

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
- S&P Global Ratings ESG Materiality Maps, July 20, 2022

Analytical Contacts

Primary contact

Shirley Lui
Hong Kong
+852-2912-3063
shirley.lui
@spglobal.com

Secondary contacts

Jay Lau
Hong Kong
+852-2533-3568
jay.lau
@spglobal.com

Research contributor

Rimpal Acharya
Pune
CRISIL Global Analytical Center, an S&P affiliate