MOF
MINISTRY OF FINANCE
SINGAPORE

Singapore Green Bond Framework

January 2025

Contents

1. Introduction

1. Introduction

1.1.
Singapore's Commitment to Sustainable Development and Combating Climate Change

Climate change is a global existential challenge. Singapore has a deep interest in global efforts to address potential disruptions to natural ecosystems and human societies. It remains Singapore's firm belief that climate change must be addressed at the multilateral level.

Following our ratification of the Paris Agreement[1] in 2016, Singapore pledged in 2022 to achieve net zero emissions by 2050 as part of our Long-Term Low-Emissions Development Strategy ("LEDS"). We also announced that we will enhance our 2030 Nationally Determined Contribution ("NDC")[2] to reduce emissions to around 60 $MtCO_2e$ in 2030 after peaking emissions earlier. These are ambitious targets for Singapore, as a resource-constrained and alternative energy-disadvantaged city-state.

To facilitate Singapore's low-carbon transition, we have implemented sector-specific decarbonisation plans and set targets to meet our national commitment. Singapore also contributes to global climate action such as through international co-operation in the development of sustainable technologies and financial tools, and collaborating with regional partners on taxonomy alignment.

Singapore Green Plan 2030

The Singapore Green Plan 2030[3] ("Green Plan") is a whole-of-nation movement to advance the national agenda on sustainable development. The Green Plan charts concrete sustainability targets, strengthening Singapore's commitments under the United Nations' ("UN") 2030 Sustainable Development Agenda and Paris Agreement, and positioning us to achieve our long-term net zero emissions target.

[1] The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties to the UNFCCC at the 21st session of the Conferences of the Parties in Paris, on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit the rise in average global temperature to well below 2 degrees Celsius, and to pursue efforts to limit this further by 1.5 degrees Celsius, compared to pre-industrial levels.

[2] More information about Singapore's updated LEDS and 2030 NDC can be found at www.nccs.gov.sg/media/publications/singapores-long-term-low-emissions-development-strategy/. Singapore's progress towards our 2030 NDC has also been reported in our first Biennial Transparency Report which can be found at www.nccs.gov.sg/singapore-s-first-biennial-transparency-report/.

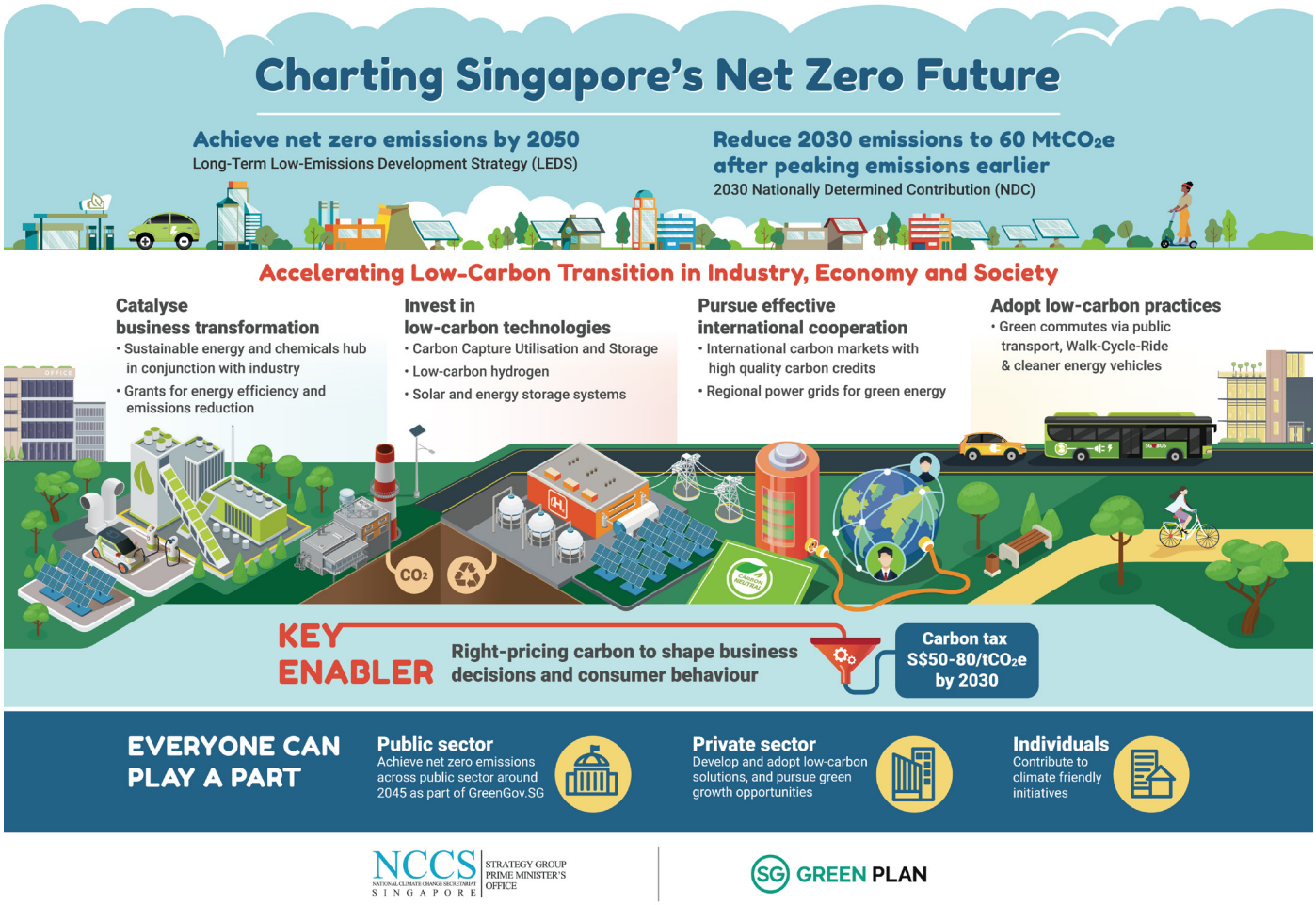
[3] Details of the Singapore Green Plan 2030 can be found at www.greenplan.gov.sg.

Charting Singapore's Net Zero Future

We will accelerate Singapore's low-carbon transition for industry, economy, and society through four key thrusts[4].

1. Catalysing business transformation;
2. Investing in low-carbon technologies;
3. Pursuing effective international cooperation; and
4. Adopting low-carbon practices.

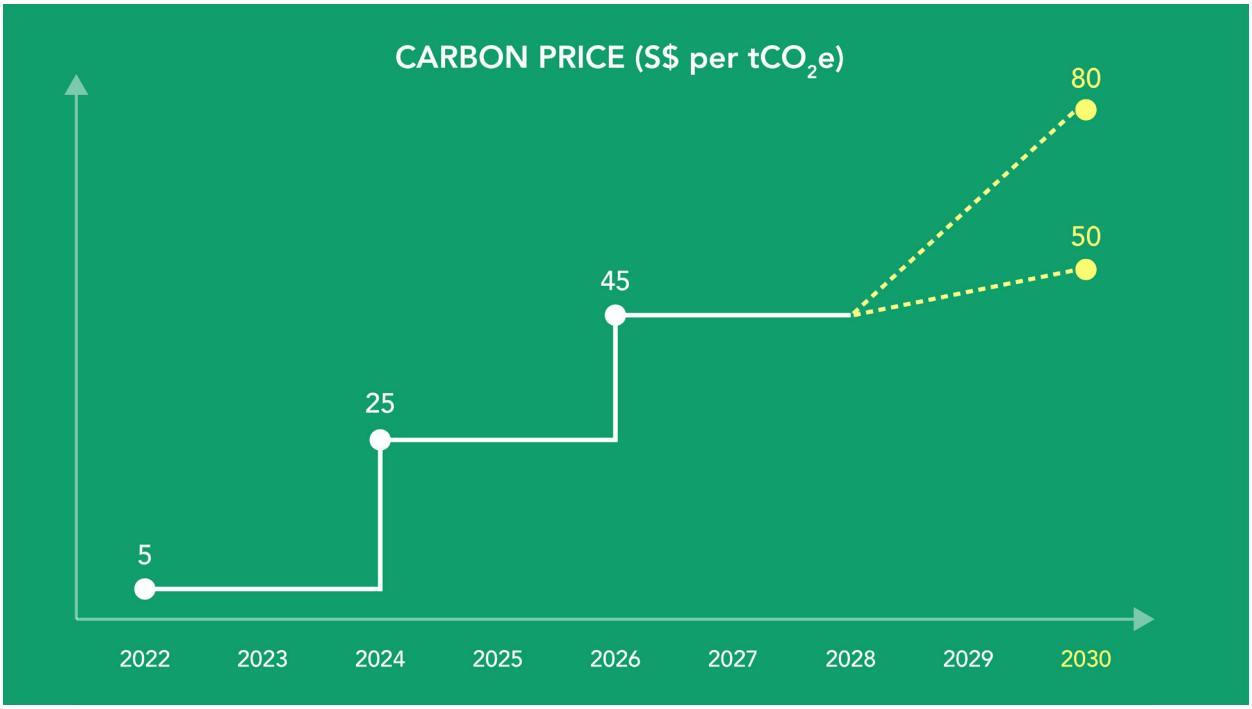
The transition will also be enabled by a broad-based carbon tax.



Regulation through carbon tax. In 2019, Singapore implemented a carbon tax, the first carbon pricing scheme in Southeast Asia. An appropriate carbon price signal is one of the cornerstones of a successful green transition – to steer producers and consumers away from carbon-intensive goods and services, promote industry innovation and green growth, while maintaining our overall economic competitiveness.

[4] More information about Singapore's decarbonisation measures can be found at www.nccs.gov.sg/singapores-climate-action/mitigation-efforts/overview/.

Singapore is progressively raising the carbon tax. In 2024, we raised the carbon tax from S$5/tCO$_2$e to S$25/tCO$_2$e. It will be raised to S$45/tCO$_2$e in 2026 and 2027, with a view to reaching S$50-80/tCO$_2$e by 2030. This strengthens the price signal and impetus for businesses and individuals to reduce their carbon footprint in line with our national climate goals.

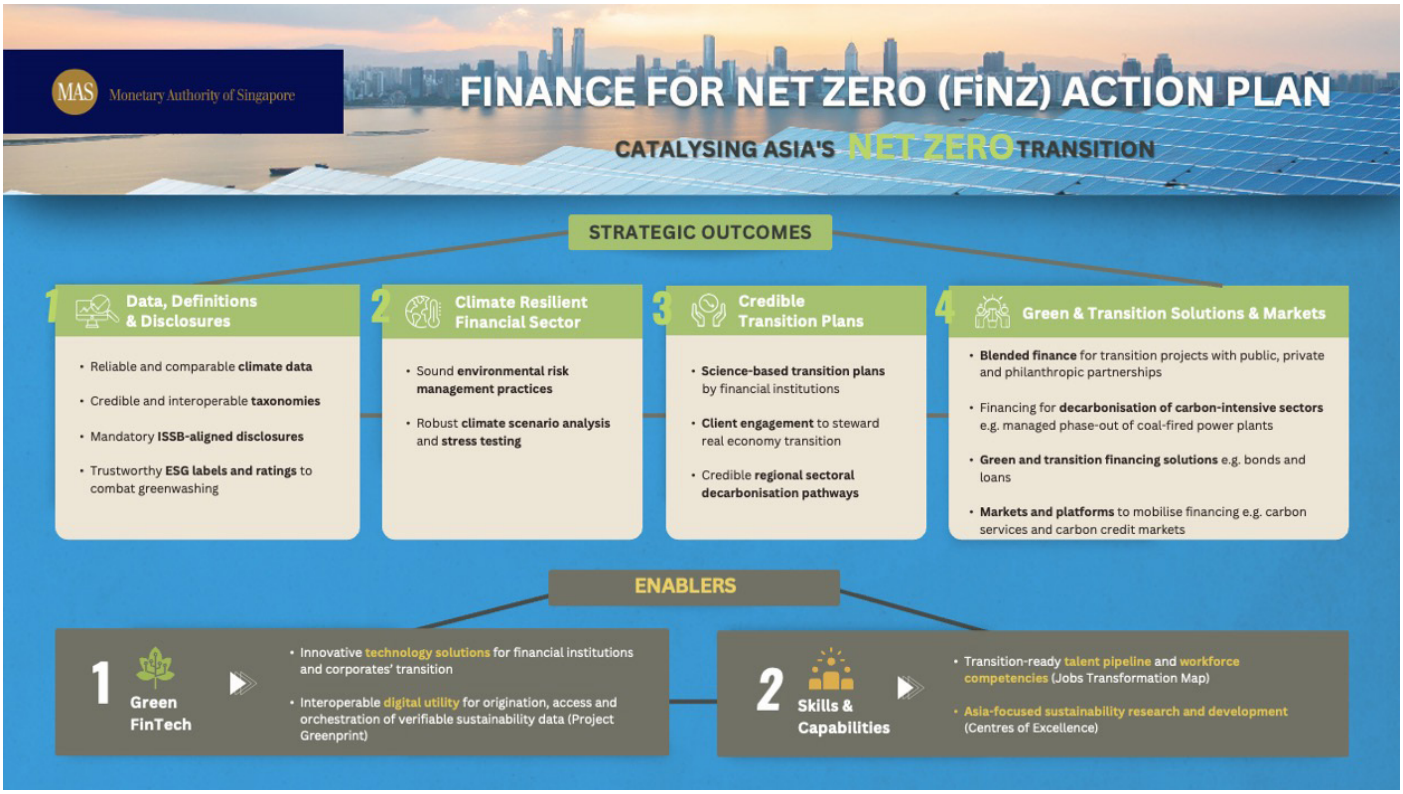


1.2.
Singapore's Support for Sustainable Finance

Green and transition finance are key enablers in facilitating investments in green technologies, products, and services. In Southeast Asia alone, US$1.5 trillion in investments will be needed until 2030 to enable the sustainable transition and put the region on the path to net zero[5]. As a champion for sustainable development and an international financial hub, Singapore is well-placed to support a more sustainable economy and catalyse Asia's net zero transition.

In recognition of the role that Singapore can play in green and transition finance, the Monetary Authority of Singapore ("MAS") launched the Finance for Net Zero ("FiNZ") Action Plan in April 2023, which sets out MAS' strategies to mobilise financing to catalyse Asia's net zero transition and decarbonisation activities in Singapore and the region. The FiNZ Action Plan aims to achieve four strategic outcomes: (i) promoting consistent, comparable, and reliable climate data and disclosures; (ii) engaging financial institutions ("FIs") to foster sound environmental risk management practices and deepen climate scenario analysis; (iii) supporting FIs' adoption of credible transition plans; and (iv) promoting innovative and credible sustainable finance markets and solutions. To enable these outcomes, MAS will continue to grow and scale Green FinTech solutions and to develop the skills and capabilities of the Singapore workforce.

[5] Bain & Company, GenZero, Standard Chartered, and Temasek, *Southeast Asia's Green Economy 2024 Report: Moving the needle.*



As ASEAN's largest market for green bonds and loans, accounting for more than half of the market[6], Singapore has been supporting businesses to access green and sustainable financing instruments. MAS has grant schemes that defray the cost of external reviews for such financing, such as the Sustainable Bond Grant Scheme and Sustainable Loan Grant Scheme.

The Singapore Government is committed to supporting the growth of Singapore's sustainable finance market, with a planned issuance of up to S$35 billion in public sector green bonds by 2030. These issuances will build on MAS' efforts to develop green financing solutions and markets, by deepening market liquidity for green bonds, attracting green issuers, capital, and investors, and anchoring Singapore as a green finance hub in Asia.

[6] Climate Bonds Initiative, May 2023, *ASEAN Sustainable Finance: State of the Market 2022*.

2.
Singapore Green Bond Framework

2. Singapore Green Bond Framework

The Singapore Green Bond Framework ("Framework") is an important component of Singapore's overarching sustainability strategy, and a key pillar of public sector efforts to achieve our net zero ambitions. It governs the issuance of green bonds by the Singapore Government under the Significant Infrastructure Government Loan Act 2021 ("SINGA"), and serves as a reference for Statutory Boards' ("SBs")[7] respective green bond frameworks.

This Framework has been updated from the inaugural version published in June 2022. It features Singapore's updated efforts in sustainable development, and aligns with the latest sustainable finance standards including the Singapore-Asia Taxonomy for Sustainable Finance ("Singapore-Asia Taxonomy")[8].

The Singapore Government is committed to ensuring that green bonds issued by public sector agencies are of high quality and adhere to market best practices in three ways:

(a) Alignment with international guidelines and market best practices for green bond issuances: The Framework is developed and structured in alignment with the core components and key recommendations of the International Capital Market Association ("ICMA") Green Bond Principles 2021 (with June 2022 Appendix 1) and ASEAN Capital Markets Forum ASEAN Green Bond Standards 2018. All green bonds issued under the Framework will conform to the four core components.

Core components	
Use of Proceeds	The proceeds of the issuance of the green bond must be utilised for eligible green expenditures which contribute to the environmental objectives set out in the ICMA Green Bond Principles and the ASEAN Green Bond Standards
Project Evaluation and Selection	The issuer should clearly communicate to investors (i) the environmental sustainability objectives of the eligible green expenditures, (ii) the process by which the issuer determines how the expenditures fit within the eligible expenditure categories, and (iii) complementary information on processes by which the issuer identifies and manages social and environmental risks associated with the relevant expenditures
Management of Proceeds	The net proceeds of the green bond issuance, or an amount equal to these net proceeds, should be tracked by the issuer in an appropriate manner, and attested to by the issuer in a formal internal process linked to the issuer's investment operations for eligible green expenditures
Reporting	Updated information on the use of proceeds, including allocation and expected impact, should be provided to investors at least annually until full allocation and in case of material changes

[7] SBs will issue their own green bond frameworks to demonstrate how their respective frameworks are aligned with international guidelines and market best practices.

[8] The Singapore-Asia Taxonomy was published in December 2023. More information can be can found at www.mas.gov.sg/-/media/mas-media-library/development/sustainable-finance/singaporeasia-taxonomy-updated.pdf

Key recommendations	
Green Bond Framework	The issuer should explain the alignment of the green bonds or green bond programme with the four core components, set out in a green bond framework in a readily accessible format to investors
External Review	The issuer should appoint an external review provider to assess the alignment of the green bond framework with the four core components set out above

(b) Ministerial oversight of project selection and allocation of proceeds: The Second Minister for Finance chairs the Green Bond Steering Committee, which assumes overall responsibility for proper governance of the Framework, to provide transparency and accountability.
(c) Technical screening for green projects: The eligibility criteria for the Green Categories have been developed with reference to existing market standards and principles, including the ICMA Green Bond Principles, ASEAN Green Bond Standards, Singapore-Asia Taxonomy, and Climate Bonds Initiative ("CBI") Taxonomy and Sector Criteria. The Singapore Government will continue to align the Framework with relevant market standards as they develop.

2.1.
Use of Proceeds ("UOP")

The following table outlines the categories of Eligible Green Expenditures ("Green Categories") and provides descriptions of sub-categories and a non-exhaustive list of examples of expenditures within these categories. The categories are also mapped to the Green Plan Pillars and UN Sustainable Development Goals ("SDGs").

For the eligibility criteria, the Framework also took reference from various market standards and principles, such as the ICMA Green Bond Principles, ASEAN Green Bond Standards, Singapore-Asia Taxonomy, and CBI Taxonomy and Sector Criteria, wherever relevant and feasible. We have fully aligned the green thresholds for eligible activities in this Framework with those in the Singapore-Asia Taxonomy where applicable.

Potential green expenditures are expenditures that fall under the eligible Green Categories defined in the section below, and may include:
(a) Infrastructure capital expenditures;
(b) Operational and maintenance expenditures for public infrastructure;
(c) Expenditures on associated ancillary activities necessary for the construction, operation or maintenance of the infrastructure;
(d) Intangible assets (research and innovation, human capital and organisation);
(e) Tax expenditures (subsidies and tax exemptions); and
(f) Capital transfers to public or private entities.

Renewable Energy

Environmental Objective

Climate change mitigation

Green Plan Pillar

Energy Reset
Green Economy

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities

• Renewable energy generation capacity (including wind power, solar power, bioenergy, geothermal energy, ocean energy and hydropower).
  ○ All energy generation activities from wind power, solar photovoltaic ("PV"), concentrating solar power ("CSP") and ocean energy are directly eligible.
  ○ For bioenergy, the following criteria would apply:
  (i) Emission intensity measured during the lifecycle of the power plant is less than 100gCO_2e/kWh; and
  (ii) Biofuel could be from waste or non-waste[9] bioenergy feedstock, which must be sourced sustainably[10].
  ○ For geothermal energy, emission intensity measured during the lifecycle of the power plant is less than 100gCO_2e/kWh.
  ○ For hydropower, the following criteria would apply:
  (i) Power density must be greater than 5W/m^2 or emission intensity measured during the lifecycle of the power plant is less than 100gCO_2e/kWh; and
  (ii) Performance of environmental and social risk assessment and incorporating mitigation measures.
	1.1. Electricity generation using solar photovoltaic and concentrating solar power
	1.2. Electricity generation from wind power
	1.3. Electricity generation from hydropower
	1.4. Electricity generation from geothermal energy
	1.5. Electricity generation from bioenergy power
	1.6. Electricity generation from ocean energy

• For electricity generation from low-carbon hydrogen or its derivatives (e.g. ammonia), the following criteria would apply: (i) Emission intensity measured during the lifecycle of the power plant is less than 100gCO_2e/kWh; and (ii) The power cannot be generated from renewable energy sources, based on a comparative assessment with the most cost-effective and technically feasible renewable alternative for the same capacity identified.	**1.11.** Electricity generation from hydrogen or its derivatives

[9] Non-waste feedstock excludes palm oil and peat, and will not be derived from land with high biodiversity, that are in competition with food production or deplete carbon pools.

[10] Feedstock used for production of bioenergy should comply with one of the following standards: Forest Stewardship Council, Biomass Biofuels voluntary scheme, Bonsucro (Better Sugarcane Initiative), Roundtable of Sustainable Biomaterials, Roundtable on Sustainable Palm Oil, Round Table on Responsible Soy, International Sustainability and Carbon Certification ("ISCC" and/or ISCC plus).

Renewable Energy (Cont'd)

Sub-categories	Singapore-Asia Taxonomy activities
• Manufacturing, storage[11] and regeneration of low-carbon hydrogen generated from renewable energy sources, with production meeting specific carbon intensity thresholds in the table below with lifecycle assessment conducted[12]. Hydrogen carbon intensity thresholds (see Appendix J of the Singapore-Asia Taxonomy (December 2023) for references and further details)	**1.10.** Storage of hydrogen or its derivatives **4.4.** Manufacture of hydrogen
• Transmission and distribution networks of renewable and low-carbon gases, including supporting infrastructure such as retrofit of natural gas distribution lines to allow 100% hydrogen and/or its derivatives and/or other low-carbon gases.	**1.8.** Transmission and distribution of renewable and low-carbon gases
• Transmission and distribution of electricity, including for electricity imports, dedicated to renewable energy sources[13], subject to one of the following criteria: ○ Transmission and distribution infrastructure dedicated to a direct connection or an expansion of connection between power plants with lifecycle emission intensity less than 100gCO_2e/kWh; or ○ Transmission and distribution infrastructure dedicated to an inter-country/region direct or grid connection to access existing or new power plants with lifecycle emission intensity less than 100gCO_2e/kWh; or ○ Transmission and distribution infrastructure that is on a decarbonisation trajectory where at least 67% of the newly connected generation capacity in the system is below the emission threshold value of 100gCO_2e/kWh measured on a Product Carbon Footprint ("PCF") basis, over a rolling five-year period; or the average system grid emissions factor is below the threshold value of 100gCO_2e/kWh measured on a PCF basis, over a rolling five-year average period.	**1.7.** Transmission and distribution of electricity
• Research and development ("R&D") and test-bedding for clean and renewable energy technologies.	Not covered in the Singapore-Asia Taxonomy (December 2023)

	Criteria			
	2022 (kgCO_2e/kgH_2)	2030 (kgCO_2e/kgH_2)	2040 (kgCO_2e/kgH_2)	2050 (kgCO_2e/kgH_2)
Production of hydrogen	3	1.5	0.6	0

[11] For storage of hydrogen or its derivatives, one of the following would apply: construction of hydrogen storage facilities; conversion of existing underground gas storage facilities into storage facilities dedicated to hydrogen storage; or operation of hydrogen storage facilities.

[12] In accordance with the requirements and criteria in Appendix N of the Singapore-Asia Taxonomy (December 2023).

[13] All enabling ICT systems and smart management systems and those required for the procurement of electricity that meet the green thresholds are eligible.

Renewable Energy (Cont'd)

Example Eligible Expenditure:

- ***Solar PV.*** Solar remains the most promising renewable energy source in the near-term for Singapore. Singapore is investing into R&D to improve the performance of solar photovoltaic cells, develop innovative ways of integrating solar energy systems into our urban environment, and manage the intermittency introduced by solar electricity generation. 1.35 gigawatt-peak ("GWp") of solar has been installed (as of June 2024) and Singapore is on track to achieving its solar deployment target of at least 2GWp by 2030 (equivalent to powering 350,000 households a year).
- ***National Hydrogen Strategy.*** Low-carbon hydrogen can play an important role in the decarbonisation journey, given that it has applications across various sectors and processes, such as power generation, maritime bunkering, industrial processes, mobility and aviation. Singapore's ability to tap on low-carbon hydrogen to decarbonise will depend on the availability and security of low-carbon hydrogen supply chains in the future. The National Hydrogen Strategy was launched in 2022 to lay out five key thrusts on how we will focus our efforts to build capabilities, for when hydrogen becomes viable.

Energy Efficiency

Environmental Objective

Climate change mitigation

Green Plan Pillar

Energy Reset
Green Economy

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities
• Energy efficiency programmes for the commercial, public and industrial sectors, including district cooling or heating fed primarily by renewable energy, production of heat or cool from waste heat and smart grids.	**1.13.** District heating and cooling systems **1.14.** Production of heat or cool from waste heat
• Energy storage as may be necessitated by the deployment of low-carbon energy sources, including to mitigate the risk of electricity import disruption. Energy storage systems[14] include but are not limited to mechanical, thermal, pumped hydropower, and electrochemical.	**1.9.** Storage of electricity
• R&D for new energy efficiency technologies.	Not covered in the Singapore-Asia Taxonomy (December 2023)

Example Eligible Expenditure:

- ***Energy Storage Systems ("ESS").*** Singapore has set a target of deploying 1.5GWp of solar by 2025 and at least 2GWp by 2030. However, solar is intermittent and ESS will be required to address solar intermittency to ensure grid reliability. In tandem with Singapore's ambitions to increase solar deployment and enhance grid resilience, the Energy Market Authority appointed Sembcorp Industries to build, own and operate a utility scale ESS on Jurong Island in June 2022. The 285MWh ESS facility, which was commissioned in December 2022, can meet the electricity needs of around 24,000 4-room HDB households for one day, in a single discharge.

[14] Where the activity includes chemical energy storage, the medium of storage complies with the criteria for manufacturing of the corresponding product specified in the Singapore-Asia Taxonomy (December 2023).

Green Buildings

Environmental Objective

Climate change mitigation

Green Plan Pillar

Energy Reset

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities
• Buildings that meet the prevailing Building and Construction Authority's ("BCA") Green Mark certification[15] through: ○ New construction ○ Renovation of existing buildings ○ Acquisition of buildings[16]	**3.1.** Construction of new buildings **3.3.** Renovation of existing buildings **3.4.** Acquisition or ownership of buildings
• Data centres that comply with all of the following criteria: ○ New facilities[17] must comply with BCA-IMDA Green Mark Scheme for Data Centres – Platinum rating[18]; ○ Global warming potential ("GWP") of refrigerants used in the data centre cooling system must not exceed 675, or meet applicable Singapore standards or regulations[19], whichever is lower; and ○ Projects involving construction of new facilities must also comply with prevailing BCA Green Mark Certification.	**3.1.** Construction of new buildings **7.1.** Data processing, storage, transmission, and management
• Installation of renewable energy equipment, renewable energy charging stations and regulation devices or equipment within the two highest energy efficiency classes for equipment, as determined by relevant international labelling scheme or Singapore regulation.	**3.2.** Installation, maintenance, repair of equipment

[15] The latest certification standard as of this version of the Singapore Green Bond Framework is the BCA Green Mark 2021 ("GM: 2021"), which covers both full GM: 2021 and GM: 2021 In Operation schemes. New buildings and existing buildings with major retrofit are required to achieve energy efficiency improvement threshold of ≥50% over 2005 baseline to attain Gold^{Plus}. More information about GM: 2021 can be found at www1.bca.gov.sg/buildsg/sustainability/green-mark-certification-scheme/green-mark-2021.

[16] Where Green Mark certification is not available, the building must be within the top 15% of the national stock compared with relevant assets.

[17] New facilities refer to new data centres, existing data centres undergoing major retrofit or increase in data capacity.

[18] The implementation of the certification standards should be verified by an independent third-party and audited at least every three years. Re-certification has to be obtained every three years. PUE threshold should reference the latest version of the BCA-IMDA Green Mark Scheme for Data Centres – Platinum rating, and must be updated every 3 years. The latest certification standard as of this version of the Singapore Green Bond Framework is BCA-IMDA Green Mark for Data Centres (2024) ("GMDC: 2024"), which is applicable to all new applications from 1 March 2025 onwards and all projects from 1 June 2025 onwards (including GMDC: 2019 projects completing on or after this date). The PUE threshold for Platinum rating in GMDC: 2024 is 1.39 at 25% IT load. More information about GMDC standards can be found at www1.bca.gov.sg/buildsg/sustainability/green-mark-certification-scheme/green-mark-assessment-criteria-and-online-application.

[19] In Singapore, under the Environmental Protection and Management Act, the GWP of refrigerant used in electrically driven water-cooled chillers with cooling capacity of 1,055kW or more that is used for one or more purposes that include producing chilled water for air-conditioning must not exceed the prescribed GWP of 15. This includes water-cooled chillers that produce chilled water for the cooling of data server halls or rooms and office spaces in data centres.

Green Buildings (Cont'd)

Example Eligible Expenditure:

- ***Singapore Green Building Masterplan ("SGBMP")***[20]**.** The SGBMP captures Singapore's collective commitment to pursue more ambitious sustainability standards in our Built Environment and is part of the Green Plan. The SGBMP aims to deliver three key targets of "80-80-80 in 2030":
  1. Green 80% of our buildings by gross floor area ("GFA") by 2030
  2. 80% of new developments by GFA to be Super Low Energy ("SLE") buildings from 2030
  3. Achieving 80% improvement in energy efficiency for best-in-class green buildings over 2005 levels by 2030
- ***Green Towns Programme***[21]**.** The Green Towns Programme is a 10-year plan to make HDB towns more sustainable and liveable. There are 5 focus areas in the programme: Reducing Energy Consumption, Recycling Rainwater, Reducing Waste, Promoting Green Commute, and Cooling HDB Towns. The programme aims to reduce energy consumption in HDB towns by 15% from 2020's levels by 2030.

[20] More information about the SGBMP can be found at www1.bca.gov.sg/buildsg/sustainability/green-building-masterplans.

[21] More information about the Green Towns Programme can be found at www.hdb.gov.sg/about-us/our-role/smart-and-sustainable-living/Green-Towns-Progamme.

Clean Transportation

Environmental Objectives

Climate change mitigation
Pollution prevention and control

Green Plan Pillar

Sustainable Living
Energy Reset

SDGs mapping

Sub-categories

- Land transport infrastructure and mobility solutions with zero direct tailpipe CO_2 emission:
  - Electrified railway infrastructure, including rolling stock and other related assets and expenditures.
  - Electric bus infrastructure, buses and other related assets and expenditures.
  - Electric vehicle ("EV") charging infrastructure and solutions (e.g. charging points and swap stations, cabinets) and related assets including:
    - Electricity grid connection upgrades necessary to support the deployment and operation of infrastructure for charging EVs; and
    - All other solutions related to optimising and/or providing the necessary electrical capacity to support the deployment and operation of EV charging solutions.
  - Personal mobility and cycling infrastructure and solutions (e.g. cycling tracks, pedestrian zones, parking provisions for active mobility modes, electrical charging and hydrogen refuelling installations for personal mobility devices).
  - Other relevant infrastructure or assets that help to increase accessibility and connectivity of public transport and active mobility networks, which support zero direct emission mobility solutions, to increase its usage and ultimately reduce reliance on private vehicle transportation and greenhouse gas emissions.

Singapore-Asia Taxonomy activities

2.1. Transport via railways

2.3. Urban and suburban passenger land transport

2.5. Low-carbon transport infrastructure

Clean Transportation (Cont'd)

Sub-categories	Singapore-Asia Taxonomy activities

• For water transport infrastructure, infrastructure to be within the scope of at least one of the following:
  ○ Electricity charging or hydrogen-based refuelling; or
  ○ Infrastructure dedicated to the provision of shore-side electrical power to vessels at berth; or
  ○ Infrastructure dedicated to the performance of the port's own operations with zero direct tailpipe CO_2 emissions; or
  ○ Infrastructure and installations dedicated to transshipping freight between the modes: terminal infrastructure and superstructures for loading, unloading and transshipment of goods.
• For sea and coastal water transport of passengers or freight (that is not dedicated to the transport of fossil fuels), vessel must comply with one of the following criteria:
  ○ Vessel has zero direct tailpipe CO_2 emissions, with an emphasis on tank-to-wake emissions and in line with the International Maritime Organization ("IMO")'s guidelines on lifecycle analysis of fuels; or
  ○ Vessel derives 100% of the energy used onboard from fuels or other energy carriers which achieve at least 80% greenhouse gas emission savings compared to their fossil fuel equivalent on a tank-to-wake basis; or
  ○ Vessel complies with emission intensity thresholds (in Energy Efficiency Operational Index ("EEOI")[22] and Annual Efficiency Ratio ("AER")[23])[24] throughout its economic life.
  ○ If vessels are using biofuels, these must meet the Singapore-Asia Taxonomy's Green criteria for biofuels (indicated in the Energy section), and be recognised by the IMO as relevant and eligible fuels or energy carriers used for propulsion and operation of ships taking into account the IMO's Guidelines on the Lifecycle GHG Intensity of Marine Fuels.
• For inland water transport of passengers or freight, vessel has zero direct tailpipe CO_2 emissions.
	2.5. Low-carbon transport infrastructure
	
	2.6. Sea and coastal water transport
	
	2.7. Inland water transport

[22] EEOI represents the CO_2 emitted per tonne-nautical mile for a voyage or specific time period. It can either be calculated from fuel consumption measurements and information on cargo carried and distance travelled or estimated using satellite tracking data and fleet technical specifications. EEOI therefore accounts for the real operating conditions of the vessel and their impact on fuel consumption (e.g. speed, weather, draught).

[23] AER measures carbon emissions associated with transport work, but it uses a ship's size (deadweight) as a proxy for cargo carried and assumes that the ship is fully loaded on all journeys.

[24] The fleet type and size category median values in EEOI and AER for each decade starting from 2020 to 2050 are provided in Table 3 (Emissions intensity thresholds for shipping) of the Singapore-Asia Taxonomy (December 2023).

Clean Transportation (Cont'd)

Sub-categories	Singapore-Asia Taxonomy activities

• For airport and air transport infrastructure, infrastructure to be within the scope of at least one of the following:
  ○ Infrastructure dedicated to the provision of fixed electrical ground power and preconditioned air to stationary aircraft, as well as electrical charging and hydrogen refuelling for aircraft and ground handling vehicles and equipment at the airport; or
  ○ Infrastructure dedicated to support and enable zero-emission aviation including electric charging points, electricity grid upgrades, hydrogen refuelling stations, resource circularity, renewable energy, optimise energy and systems efficiency to reduce emissions from the airport's own operations; or
  ○ Air traffic management infrastructure or processes or activities dedicated to enable zero-emission aviation[25]; or
  ○ Airport ground handling vehicles and equipment with zero direct tailpipe CO_2 emissions.
• For air transport of passengers or freight (that is not dedicated to the transport of fossil fuels), aircraft has zero exhaust CO_2 emission such as those powered by electricity or hydrogen meeting the relevant taxonomy criteria[26].
	2.2. Other passenger land transport
	2.5. Low-carbon transport infrastructure
	2.8. Air transport

• R&D for low- and zero-emission transportation technologies.	Not covered in the Singapore-Asia Taxonomy (December 2023)

Example Eligible Expenditure:

- ***Land Transport Master Plan 2040.*** Singapore aims to reduce the sector's emissions by encouraging the use of public transport and active mobility and transition to a cleaner-energy vehicle population. Relative targets include expanding our rail network to 360km by the early 2030s, connecting 8 in 10 households to within 10 minutes of a train station, expanding the cycling path network to around 1,300km to promote active mobility, and deploying 60,000 charging points in public carparks and private premises to facilitate the adoption of EVs by 2030.

[25] Possible measures include but are not limited to those captured in Appendix M4 of the International Civil Aviation Organization's ("ICAO") Report on the Feasibility of a Long-term Aspirational Goal. These measures are also in line with ICAO's Global Air Navigation Plan and the Aviation System Block Upgrades.

[26] Green criteria in the Singapore-Asia Taxonomy is pending further development of credible, science-based, and 1.5°C-aligned pathway by ICAO, which will be reviewed for inclusion in the future.

Sustainable Water and Wastewater Management

Environmental Objective

Natural resource conservation
Pollution prevention and control

Green Plan Pillar

Sustainable Living
Energy Reset

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities

• Water collection, treatment and supply systems:
  ○ Distribution networks: Distribution loss is less than 10% for the segment of the network.
  ○ Abstraction and treatment systems[27]: Net average energy consumption[28] is equal to or lower than 0.5 kWh/m^3 of water produced for supply.
	9.1. Construction, extension and operation of new water collection and treatment systems (abstraction and treatment systems)
	
	9.2. Renewal of water collection, treatment and supply systems (abstraction and treatment systems)
	
	9.3. Construction, extension and operation of water collection, treatment and supply systems (distribution networks)
	
	9.4. Renewal of water collection, treatment and supply systems (distribution networks)

• Desalination systems: ○ The average carbon intensity of energy used must be at or below 350gCO_2/m^3 of potable water produced; or the energy used must have carbon intensity less than 100gCO_2/kWh over the remaining lifetime of the asset.	**9.5.** Desalination systems
• Wastewater collection and treatment systems[27]: ○ Net energy consumption is equal to or lower than 0.27 kWh/m^3 [28].	**9.6.** Construction, extension and operation of wastewater collection and treatment **9.7.** Renewal of wastewater collection and treatment
• NEWater[29] treatment systems: ○ Reduce specific energy consumption from baseline and conserve resources through recovery of treated wastewater to NEWater.	Not covered in the Singapore-Asia Taxonomy (December 2023)

[27] The activity excludes energy consumption associated with pumping potable water from the water treatment plant to the distribution network or pumping used water from the Deep Tunnel Sewerage System to the wastewater treatment plant.

[28] Net energy consumption may take into account measures that decrease energy consumption relating to source control (reduction of pollutant load inputs), and, as appropriate, on-site or off-site renewable energy generation. Based on the definitions in the Singapore-Asia Taxonomy (December 2023), the green threshold for wastewater treatment plant capacities above 100,000 population equivalent ("p.e.") is 20 kWh/p.e. per annum. 1 p.e. is defined as 200L/day and 1 p.e. per annum is hence 73 m^3 of used water treated. The ratio of 20 kWh to 73 m^3 of used water treated is about 0.27 kWh/m^3.

[29] NEWater is Singapore's local supply of high-grade reclaimed water that is produced from treated wastewater.

Sustainable Water and Wastewater Management (Cont'd)

Example Eligible Expenditure:

- ***Singapore Water Story.*** The Public Utilities Board ("PUB"), Singapore's National Water Agency, adopts a holistic approach to water management, managing the entire water loop as a whole to optimise resource and efficiency. It sets out to manage Singapore's water supply, water catchment and used water in an integrated way.
  - ***Supply Good Water.*** PUB has ensured a diversified and sustainable supply of water for Singapore with the Four National Taps (local catchment water, imported water, NEWater, desalinated water). Rainwater is collected through rivers, streams, canals and drains, and stored in 17 reservoirs. With the pipelines linking the various reservoirs, the excess water can be pumped from one reservoir to another, thus optimising storage capacity. PUB operates its water treatment facilities to optimise efficiency and keep resource utilisation low.
  - ***Reclaim Used Water.*** Water that has been used by customers is collected through an extensive sewerage system and treated at water reclamation plants. Treated used water is further purified using advanced membrane technology to produce high-grade reclaimed water, known as NEWater.

Pollution Prevention, Control and Circular Economy

Environmental Objective

Pollution prevention and control
Natural resource conservation

Green Plan Pillar

Sustainable Living
Resilient Future

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities
• Collection and transportation of non-hazardous waste that is segregated at source or at an intermediate sorting facility that is intended for preparation for reuse or recycling operations, and waste collection containers, transfer stations, transportation vehicles and other related infrastructure. • Processing and recycling of non-hazardous waste.	**8.1.** Collection and transport of non-hazardous waste

• For biowaste treatment (composting of biowaste), the activity should comply with the following criteria:
  ○ The biowaste that is composted is source segregated and collected separately; and
  ○ Ensure efficient operations to avoid methane leakage (e.g. improper aeration or mixing); and
  ○ The compost produced is used as fertiliser or soil improver.
• For biowaste treatment (anaerobic digestion), the activity should comply with the following criteria:
  ○ The biowaste that is used for anaerobic digestion is source segregated and collected separately; and
  ○ The produced biogas is used directly for the generation of electricity or heat or upgraded to bio-methane for injection in the grid or used as vehicle fuel or as feedstock in chemical industry; and
  ○ The produced digestate –
  • from biowaste (excluding sewage sludge) from single digestion facilities is used as fertiliser or soil improver, either directly or after composting or any other treatment as permitted by the applicable regulations; or
  • from anaerobic digestion of sewage sludge will be further processed and not disposed directly in landfills. Sludge incineration needs to have thermal efficiency of 70% and allow energy recovery, and after incineration this gets converted to ash which can be landfilled; or
  • from co-digestion facilities must be processed further to ensure resource recovery and cannot be disposed directly; and
  ○ A monitoring and contingency plan is in place to minimise methane leakage at the facility, and
  ○ Woody waste must be segregated before or after processing and sent to an eligible treatment plant (such as composting or biomass-based energy plants).
	8.2. Biowaste treatment: composting of biowaste
	
	8.3. Biowaste treatment: anaerobic digestion

Pollution Prevention, Control and Circular Economy (Cont'd)

Sub-categories	Singapore-Asia Taxonomy activities
• Waste-to-energy ("WTE") for residual or pre-sorted waste, with gross plant efficiency of at least 25%[30], and on-site or off-site bottom ash recovery with at least 75% recovery of metal from ash. • R&D investments related to developing and testing new and emerging WTE technologies, including but not limited to pyrolysis and gasification that can produce alternate and sustainable fuels or chemicals.	**8.4.** Waste to Energy (Incineration)
• Material recovery of recyclables including waste collection and sorting (including pre-sorting), with recovery efficiency of at least 50%. The sorted waste may then be used as secondary raw materials that are suitable for the substitution of virgin materials in production processes. • All facilities and equipment such as conveyor belts, compactors, pelletizers, air classifiers, magnetic belts, and other infrastructure required for material recovery are eligible.	**8.6.** Material recovery facilities
• Reusing and recycling used EV batteries.	**4.7.** Manufacture of batteries
• Food waste treatment that treats food waste into high-quality bio-pulp.	Not covered in the Singapore-Asia Taxonomy (December 2023)
• R&D and innovation for low-carbon technologies, including those dedicated to carbon capture, transportation and storage including point source or direct air carbon capture technologies.	**6.4.** Research, development, and innovation for CCS-related technologies, including direct air capture

Example Eligible Expenditure:

- Eligible expenditure under ***Integrated Waste Management Facility ("IWMF").*** The IWMF is an integral part of NEA's long-term plan to meet Singapore's solid waste management needs. IWMF will be equipped with state-of-the-art solid waste treatment technologies to improve energy and resource recovery from waste. It is Singapore's first integrated facility to treat incinerable waste, source-segregated food waste and dewatered sludge from Tuas Water Reclamation Plant, as well as to sort household recyclables collected under the National Recycling Programme.
- ***Carbon capture, utilisation and storage ("CCUS").*** CCUS technologies have the potential to decarbonise the power sector and enable the energy transition in the longer term. Singapore has set aside over S$180 million of Research, Innovation and Enterprise funds under the Low-Carbon Energy Research Funding Initiative, to support R&D into low-carbon technologies, including CCUS, to enable local deployment in future.

[30] Only solid waste collected from domestic and commercial and industrial waste sources (Type A and Type B) will be treated.

Climate Change Adaptation

Environmental Objective

Climate change adaptation

Green Plan Pillar

Resilient Future

SDGs mapping

Sub-categories

- Information support systems, such as climate observation and early warning systems.
- Climate change resilient infrastructure, flood defence systems that reduce the impact of climate change (e.g. flooding, sea level rise, stronger winds) and other risk mitigation programmes.
- Reduce flood risks through stormwater management.
- Technical consultancy and subsequent engineering activities and full lifecycle costs dedicated to climate change adaptation.
- Modelling system, for simulating, evaluating, and forecasting flood risks.
- R&D relating to coastal protection.
- Nature-based solutions to support climate resilience such as coastal and inland flood resilience.
- Measures to achieve heat resilience such as the use of cool paints and urban greenery to reduce heat absorption.

Singapore-Asia Taxonomy activities

Not covered in the Singapore-Asia Taxonomy (December 2023)[31]

[31] Activities focusing on the environmental objective "Climate Change Adaptation" are not covered in the Singapore-Asia Taxonomy (December 2023).

Climate Change Adaptation (Cont'd)

Example Eligible Expenditure:

- ***Site-specific studies, design and implementation of coastal adaptation measures.*** The site-specific studies, design and construction of coastal protection measures will be progressively carried out, which form Singapore's coastal protection system.
- ***Development of Coastal-Inland Flood Model and other digital tools to undertake coastal management and regulation.*** The development of the Coastal-Inland Flood Model, that is capable of simulating and evaluating both inland and coastal flood risks holistically, and other digital tools required to support coastal protection system management, monitoring, and regulation.
- ***Full life-cycle expenditure of coastal adaptation infrastructure including the parts of the infrastructure that are integrated into the structure (e.g. specialised measures such as storm surge barriers or non-specialised measures like sea walls and revetments).*** Full life-cycle expenditure includes design, construction, operational and maintenance expenditure and asset replacement or renewal expenditure.
- ***R&D to better understand sea-level rise projections and innovative technology or modelling to better understand coastal processes to support coastal protection works.*** On the climate science front, the Meteorological Service Singapore established the Centre for Climate Research Singapore[32] ("CCRS") to improve the nation's capabilities in climate science and modelling. The CCRS will anchor climate science capabilities in Singapore over the long term. On the coastal protection front, PUB has launched the Coastal Protection and Flood Resilience Institute ("CFI") Singapore, dedicated to strengthening capabilities and expertise in coastal protection and flood management. CFI Singapore is a key pillar under PUB's Coastal Protection and Flood Management Research Programme that will galvanise research and technology development in coastal protection and flood management.
- ***Nature-based solutions to ensure healthy ecosystem services and address challenges of sea-level rise and inland flooding due to climate change, and to mitigate urban heat.*** To supplement the efforts to adapt to the effects of climate change, the National Parks Board ("NParks") implements nature-based solutions which includes intensifying urban greenery, naturalising landscapes in parks and gardens, embarking on the OneMillionTrees movement and the Forest Restoration Action Plan to restore nature back into our city. Nature Ways along streets have the structure of forests and are extended into industrial estates to improve thermal comfort and air quality. NParks is also implementing coastal protection projects to enhance habitats through forest and mangrove restoration (e.g. Labrador Nature Reserve), and safeguard our coastlines from rising sea levels and storm surges (e.g. Kranji Coastal Nature Park and Pulau Ubin).

[32] More information about the CCRS can be found at https://ccrs.weather.gov.sg.

Biodiversity Conservation and Sustainable Management of Natural Resources and Land Use

Environmental Objective

Biodiversity conservation
Natural resource conservation

Green Plan Pillar

Resilient Future
City in Nature

SDGs mapping

Sub-categories	Singapore-Asia Taxonomy activities
• For conservation, restoration, and maintenance of natural or pristine forests, the following activities would be eligible: o Land acquisition for the purpose of conservation, restoration and maintenance, and equipment and costs incurred by the activities must be powered by renewable energy or appear amongst the most energy efficient in Singapore, as certified by Singapore energy efficiency standards; o Use of organic and biofertilisers (only relevant for restoration or replanting of natural forest); o Use of physical and biocontrol[33] of pathogens, pests and weeds; o Nurseries[34] with the adoption of Integrated Farm Management[35] practices and the seeds and seedlings are sourced from native species in sustainably managed areas; o Adoption and maintenance of monitoring technology that enables the tracking of the forest extracts and its conservation status.	**5.3.** Conservation, restoration, and maintenance of natural/pristine forests
• Other activities related to the improvement in sustainability and liveability of the urban environment, such as habitat restoration, species recovery, terrestrial and aquatic biodiversity conservation (e.g. habitat enhancement, nature corridors and nature ways for ecological connectivity).	Not covered in the Singapore-Asia Taxonomy (December 2023)[36]

[33] It is expected that all types of biological management required by the forestry project are guided by credible technical assistance.
[34] Refer to any facility designated to produce tree seedlings grown under favourable conditions until they are ready for planting.
[35] Refer to a site-specific farm business approach that uses the best of modern technology and traditional methods, as defined by Integrated Farm Management Association.
[36] Activities focusing on the environmental objective "Protect healthy ecosystems and biodiversity" are not covered in the Singapore-Asia Taxonomy (December 2023).

Biodiversity Conservation and Sustainable Management of Natural Resources and Land Use (Cont'd)

Example Eligible Expenditure:

- ***Transforming Singapore into a City in Nature.*** To transform Singapore into a City in Nature, we are conserving and extending Singapore's natural capital island-wide, through the following key strategies: (i) expanding the nature park network; (ii) intensifying nature in gardens and parks; (iii) restoring nature into the urban landscape (e.g. through skyrise greenery); and (iv) strengthening connectivity between Singapore's green spaces (e.g. nature corridors, nature ways, and park connector networks). NParks also works with the community to encourage nature stewardship, for example through planting an additional one million trees in Singapore under the OneMillionTrees movement. To promote community ownership, stewardship, and health and well-being, NParks' programmes include Community in Nature, Community in Bloom, Nature Kakis Network, allotment gardens, Gardening with Edibles, and the development of an island-wide network of therapeutic and nature playgardens.
- ***Nature Conservation Masterplan***[37]**.** The Masterplan aims to systematically consolidate, coordinate, strengthen and intensify NParks' biodiversity conservation efforts. It comprises 4 thrusts: (i) conservation of key habitats; (ii) habitat enhancement, restoration and species recovery; (iii) applied research in conservation biology and planning; and (iv) community stewardship and outreach in nature.

[37] More information about the Nature Conservation Masterplan can be found at www.nparks.gov.sg/nature/nature-conservation-masterplan.

2.1.1. Exclusion

To avoid double-counting, proceeds from the issuance of green bonds under this Framework for the Green Categories cannot be used for expenditures incurred that are already financed via dedicated funding sources[38].

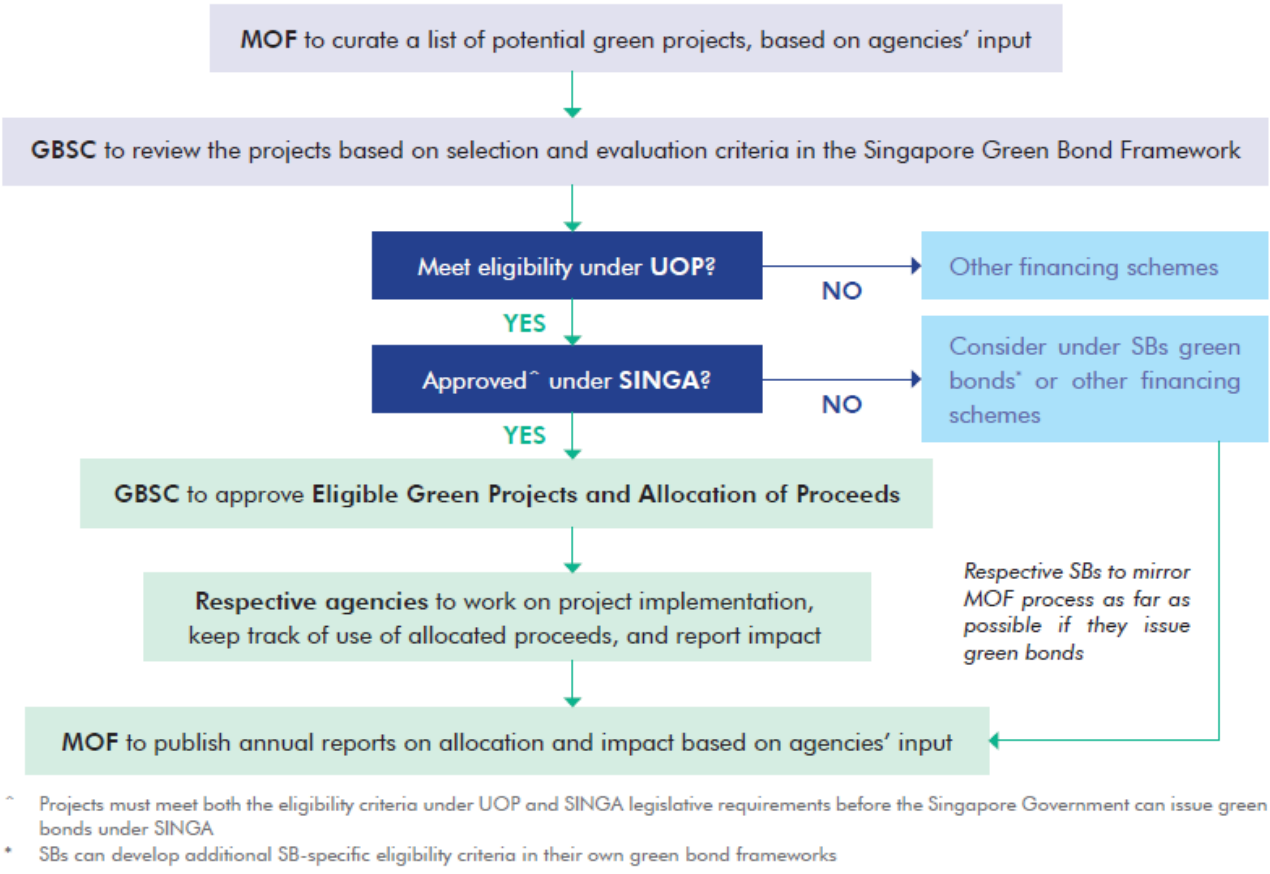
Any expenditure related to the following activities will be excluded from the Green Categories:

- Fossil fuel, fossil fuel-based electric power generation projects, and energy efficiency improvement projects for fossil fuel-based electric power generation
- Vehicles powered through fossil fuel combustion
- Non-certified sustainable palm oil
- Nuclear energy
- Lethal defence goods
- Weaponry
- Gambling
- Alcoholic beverages
- Tobacco products
- Conflict minerals
- Activities or projects associated with child labour or forced labour

It is intended that all Eligible Green Expenditures financed under this Framework shall not significantly undermine the Environmental Objectives stated in the Green Categories, and will adhere to internationally recognised principles and guidelines, as well as applicable national laws and regulations in Singapore.

2.2.
Process for Project Evaluation and Selection

Overview of processes for Project Selection and Evaluation



^ Projects must meet both the eligibility criteria under UOP and SINGA legislative requirements before the Singapore Government can issue green bonds under SINGA

* SBs can develop additional SB-specific eligibility criteria in their own green bond frameworks

[38] This includes previous green bond issuances by the Government and SBs.

2.2.1. Governance Structure

The Ministry of Finance ("MOF") has set up a Green Bond Steering Committee ("GBSC"), chaired by the Second Minister for Finance to oversee and approve key decisions related to the green bonds issued under this Framework. Its responsibilities include:

- Design and maintenance of the Framework
- Selection and evaluation of Eligible Green Expenditures
- Management of green bond proceeds
- Reporting on allocation and impact of green bonds issued

The GBSC membership comprises senior government representatives ("GBSC Members") from:

- Ministry of Finance
- Monetary Authority of Singapore
- Accountant-General's Department ("AGD")
- Ministry of Sustainability and the Environment ("MSE")
- Ministry of Transport ("MOT")

The GBSC is supported by a working-level group ("GBSC Secretariat").

2.2.2. Evaluation and Selection Process

In consultation with other public sector agencies, the GBSC Secretariat will compile an initial list of potential green expenditures/projects for review by the GBSC.

On an annual basis and as needed, the GBSC will evaluate the potential green expenditures/projects based on the eligibility criteria set out in Section 2.1 *Use of Proceeds*.

The potential green expenditures/projects will have to fulfil additional legislative requirements under the SINGA, the Development Fund Act, the Financial Procedure Act and the Financial Regulations to qualify as Eligible Green Expenditures of green bonds issued by the Singapore Government. The SINGA authorises the Singapore Government to borrow to finance qualifying capital expenditures of approved nationally significant infrastructure projects critical to Singapore's long-term development. There are legislative controls to safeguard the Singapore Government against the over-accumulation of debt and to avoid abuse and ensure fiscal sustainability.

SINGA Criteria

Criteria	Description
Ownership	Infrastructure should be owned by the Singapore Government, and controlled by or on behalf of the Singapore Government
Major	Expected project cost should be at least **S$4 billion**
Long-Term	Infrastructure should be available for use for at least **50 years**
Important to National Interests	Infrastructure should support national productivity or Singapore's economic, environmental or social sustainability

If all GBSC Members are in consensus that the potential green expenditures/projects meet both the eligibility criteria and the legislative requirements under the SINGA, GBSC will endorse and approve the expenditures/projects as Eligible Green Expenditures in accordance with the Framework. Otherwise, the expenditures/projects can be considered for financing under green bonds issued by SBs (if deemed eligible under the SBs' respective green bond frameworks) or other financing schemes by the Singapore Government.

The relevant public sector agencies will be responsible for the implementation and monitoring of Eligible Green Expenditures, and informing the GBSC of any potential non-compliance with the eligibility criteria and ESG controversies. The GBSC will review and may choose to recommend the removal of expenditures/projects from the Eligible Green Expenditures.

MOF will maintain central oversight of the Eligible Green Expenditures and issue annual reports on the allocation and impact of all green bonds issued by the Singapore Government.

2.3.
Management of Proceeds

The Singapore Government will take a portfolio approach for the allocation of net proceeds from the green bonds.

The Singapore Government will allocate the net proceeds[39] to Eligible Green Expenditures in full within 2 years.

The net proceeds will only be allocated to expenditures incurred for the Green Categories that occurred no earlier than 2 years prior to the date of issuance, and no later than 2 years from the date of issuance. At least 50% of the net proceeds will be allocated to current and future expenditures.

The Singapore Government may also issue green bonds under the SINGA to refinance maturing green bonds that were previously issued under the SINGA to finance past Eligible Green Expenditures. Green nationally significant infrastructure projects under the SINGA will have useful life of at least 50 years, while the tenor of green bonds issued will vary based on structural and cyclical drivers, including market absorption capacity for long-tenor bonds. Refinancing will be necessary when the tenors of the maturing green bonds are shorter than the useful lives of the green assets. In such cases, the Singapore Government will disclose this information at the time of refinancing.

The net proceeds of the green bonds will be transferred to the Singapore Government's separate cash account maintained with MAS, which is ring-fenced for Eligible Green Expenditures. MOF will maintain an allocation register ("Green Register") to record the allocations against Eligible Green Expenditures. For each green bond issued, the Green Register will contain information including the date of issuance, principal amount of proceeds, the International Securities Identification Number and date of maturity.

In the event where the portfolio of Eligible Green Expenditures is smaller than the net green bond proceeds outstanding due to unforeseen circumstances (e.g. construction delays) or where a financed Eligible Green Expenditure no longer complies with this Framework (e.g. following divestment, postponement, cancellation, non-compliance with eligibility criteria or potential ESG controversies), the Singapore Government will use its best endeavours to allocate the specific proceeds to other Eligible Green Expenditures as soon as reasonably practicable.

Any unallocated proceeds will be held in cash or invested in other short-term liquidity instruments. The Singapore Government does not plan to invest such unallocated proceeds in activities that are on the exclusion list set out in Section 2.1.1.

MAS, as the agent of the Singapore Government, may from time to time reopen an existing green bond by issuing further amounts of the green bond. A reopened green bond has the same maturity date and coupon rate as the existing green bond. Any reopened issue is intended to be fungible with the existing amounts of that green bond. This will not limit the Singapore Government's ability to allocate the proceeds of a reopened issue to any Eligible Green Expenditures.

[39] For green bonds issued by the Singapore Government under the SINGA, net proceeds refer to the amount equivalent to the face value of the bonds.

2.4.
Reporting

To provide timely and transparent disclosure on the use of proceeds of green bonds issued under the Framework, MOF has been preparing progress reports since 2023, and will do so until the full allocation (and subsequently on needs basis). The progress report will consist mainly of information on:

- **Allocation Reporting:** The Singapore Government will report on the allocation of the net proceeds raised from green bond issuances.
- **Impact Reporting:** The Singapore Government will report on the associated environmental benefits and social co-benefits, where possible, of the Eligible Green Expenditures. The Singapore Government will align, on a best effort basis, the impact reporting with the project-level or portfolio-level reporting approach.

The GBSC will review and approve the reports to be made available at www.go.gov.sg/greenbonds. Past years' reports can be accessed at the link.

2.4.1. Allocation Reporting

On an annual basis until full allocation and in case of material changes, MOF will report the following information:

- The total amount of green bonds outstanding
- Breakdown of allocation by Eligible Green Expenditure sub-categories
- List of Eligible Green Expenditures with descriptions and the amount that has been allocated
- Share of allocation of proceeds for refinancing versus financing of Eligible Green Expenditures, and percentage of co-financing if applicable
- The remaining balance of proceeds yet to be allocated at the end of the reporting period, with confirmation that the temporarily unallocated proceeds were held as cash or invested in other short-term liquidity instruments

The information may be presented in generic terms in the event confidentiality limits the amount of detail that can be made available.

2.4.2. Impact Reporting

On an annual basis until full allocation and in case of material changes, MOF will report on the estimated environmental benefits and, where possible, the social co-benefits of the Eligible Green Expenditures, including any material developments or ESG controversies. MOF will also align the impact reporting with the ICMA's "Handbook – Harmonised Framework for Impact Reporting (June 2024)", subject to the availability of the information.

In case of co-financing, MOF will aim to report on the pro rata share of the overall impact or provide the share of financing from the green bond proceeds as a percentage of total project financing if the overall impact is being reported.

The impact reporting will also provide information on the methodology and assumptions used for calculation of the impact indicators. Example of environmental impact indicators and social co-benefits are outlined in the table below:

Eligible Category	Examples of Environmental Impact Indicators
 **Renewable Energy**	• Annual greenhouse gas ("GHG") emissions reduced/avoided in tonnes of carbon dioxide ("CO_2") equivalent • Annual renewable energy generation in MWh/GWh (electricity) and GJ/TJ (other energy) • Additional capacity of renewable energy plants/generation in MW
 **Energy Efficiency**	• Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent • Annual energy savings in MWh/GWh (electricity) and GJ/TJ (other energy savings)

Green Buildings	• Total number and GFA of green buildings, including types and levels of certification obtained, and the percentage of new developments (by GFA) certified as Green Mark SLE (if relevant) • Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent • Annual energy savings in MWh/GWh (electricity) and GJ/TJ (other energy savings)
Clean Transportation	• Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent • Reduction of air pollutants (e.g. particulate matter ("PM"), sulphur oxides ("SO_x"), nitrogen oxides ("NO_x"), carbon monoxide ("CO"), and non-methane volatile organic compounds ("NMVOCs")). • Passenger-kilometres and/or number of passengers • Amount of infrastructure built (e.g. length of rail, walking and cycling path networks in km, number of charging points for EVs in public carparks)
Sustainable Water and Wastewater Management	• Water savings achieved in m^3 • Reduction in system distribution losses in % • Specific energy consumption in kWh/m^3 of water produced for supply • Specific energy consumption in kWh/m^3 of wastewater treated
Pollution Prevention, Control and Circular Economy	• Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent • Overall gross power efficiency for WTE in %[40] • Annual energy recovered from waste and sludge incineration in MWh/GWh (electricity) and GJ/TJ (other energy savings) • Annual Incineration Bottom Ash ("IBA") sent to off-site facility for recovery of Ferrous metals and Non-Ferrous metals in tonnes • Annual recovery of Recyclables consisting of Ferrous metals, Non-Ferrous metals, Plastics and Paper in tonnes • Annual recovery of Bottom Ash in tonnes • Annual amount of IBA diverted from landfill in tonnes • Reduction of air pollutants (e.g. coarse and fine particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide ("SO_2"), NO_x, CO, and ozone ("O_3"))
Climate Change Adaptation	• Area protected from flooding by coastal protection measures in km^2 • Length of coastal flood defences developed or upgraded • Length of drainage infrastructure developed or upgraded
Biodiversity Conservation and Sustainable Management of Natural Resources and Land Use	• Number of trees planted and amount of CO_2 sequestered in tonnes • Number of hectares of new nature parks added • Number of hectares of forest, marine and coastal habitats restored and enhanced • Length of park connectors added in km • Length of Nature Ways built in km • Amount of skyrise greenery added in hectares • Number of parks and gardens with ecological habitats restored • Number of nature playgardens added • Number of species recovery programmes implemented

Examples of Social Co-Benefits

- Number of jobs created/supported
- Number of households and/or businesses benefited

[40] Figure of Overall Gross Power Efficiency is subject to change based on calorific value of waste, actual load during operations and power degradation curve.

3. External Review

3.1. Pre-Issuance External Review

MOF has engaged independent provider, DNV, to provide pre-issuance second party opinion ("SPO") on the Framework. The SPO is available at www.go.gov.sg/greenbonds. This SPO (or another form of pre-issuance external review) will be done on a one-off basis, unless there are material changes to the Framework[41].

3.2. Post-Issuance External Verification

MOF will also engage an independent provider to provide annual external verification on the alignment of the allocation reporting with the Framework[42], until full allocation and in case of material changes. The post-issuance verification report will be available at www.go.gov.sg/greenbonds.

[41] The earlier Singapore Green Bond Framework (June 2022 version) was also subject to pre-issuance external review, and a SPO was provided by Sustainalytics (dated May 20, 2022).

[42] The allocation of green bonds issued under the earlier Singapore Green Bond Framework (June 2022 version) was disclosed in the Singapore Green Bond Report for the Financial Years 2022 and 2023.

4.
Amendments to this Framework

This is the second version of the Framework (i.e. January 2025). Both the first (i.e. June 2022) and second versions of the Framework can be found at www.go.gov.sg/greenbonds.

The GBSC will review this Framework on a regular basis, including its alignment to updated versions of the ICMA Green Bond Principles, ASEAN Green Bond Standards, and Singapore-Asia Taxonomy, as and when they are released, with the aim of adhering to market best practices. Such review may result in this Framework being updated and amended. Substantive updates will be subject to the prior approval of the GBSC. Any future, updated version of this Framework that may exist will either keep or improve the current levels of transparency and reporting disclosures, including the corresponding review by an external reviewer. The updated Framework, if any, will be published on the website and will replace this Framework.

MOF

MINISTRY OF FINANCE

SINGAPORE