



# GREEN FINANCING FRAMEWORK

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# 1. Background

## 1.1 About PUB

PUB is a statutory board under the Ministry of Sustainability and the Environment (MSE). It is the national water agency, which manages Singapore’s water supply, water catchment and used water in an integrated way. From April 2020, PUB also took on the responsibility of protecting Singapore’s coastline from sea level rise as the national coastal protection agency.

PUB ensures a diversified and sustainable supply of water for Singapore with the Four National Taps (local catchment water, imported water, NEWater and desalinated water). PUB leads and coordinates Whole-of-Government efforts to protect Singapore from the threat of rising seas and the holistic management of inland and coastal flood risks.

## 1.2 Sustainability in PUB

Sustainability is not new to PUB. Since the formation of PUB in the 1960s, every one of our milestones serves to strengthen Singapore’s water security and sustainability.

<b>Period</b>	<b>Milestone</b>
1970s	<b><u>Building up Our Water Resources</u></b>  Singapore’s first Water Master Plan was drawn up in 1972, outlining the strategies for water resources to ensure a diversified and adequate supply that could meet future requirements. At around the same time, the “Water is Precious” public education campaign was launched in 1971.
1980s	<b><u>A Cleaner City and River</u></b>  The Singapore River clean-up was launched in 1977 and spanned over a decade before it was finally completed in 1987. The last night soil bucket was phased out in 1987 and replaced by an alternative on-site sanitation system.
1990s	<b><u>Modernising Water Management and Exploring Unconventional Sources</u></b>  The Water Conservation Tax was introduced in 1991 as a pricing tool to encourage water conservation. In 1995, the electricity and gas entities were corporatised as Singapore Power, while PUB continued to manage water. By 1997, 100% of Singapore’s population were served by modern sanitation. While plans to reclaim used water began in the 1970s, it was not until the late 1990s that membrane technology matured enough to enable a reliable and cost-efficient water source. In 1998, a demonstration-scale NEWater plant was commissioned to confirm its feasibility, paving the way for its eventual large-scale roll-out.
2000s	<b><u>Diversifying our Water Resources</u></b>  PUB’s first NEWater Factories at Bedok and Kranji were launched in 2003. Singapore’s first desalination plant was opened in 2005. The Active, Beautiful, Clean Waters (ABC Waters) Programme was launched in 2006 to transform

	<p>Singapore's water bodies beyond their utilitarian purpose and bring people closer to water. The Deep Tunnel Sewerage System (DTSS) Phase 1 was completed in 2008.</p>
<p>2010s</p>	<p><b><u>Expanding and Innovating for Water Resilience</u></b></p> <p>Building on the success of our desalination and NEWater technologies, within a decade, PUB launched several water infrastructures such as the Changi NEWater Factory 1 and 2, Tuas Desalination Plant, Tuas South Desalination Plant, and the Punggol and Serangoon Reservoirs, greatly boosting our water resources. We continued to expand our research and development (R&amp;D) efforts such as the launch of the Ceramic Membrane Demonstration Plant at Choa Chu Kang Waterworks and the Upflow Anaerobic Sludge Blanket-Membrane Bioreactor Demonstration Plant at Jurong Water Reclamation Plant.</p>
<p>Moving Forward</p>	<p><b><u>Towards a Smarter and More Sustainable PUB</u></b></p> <p>As we move into a new decade, PUB must transform and adapt to the ever-changing global landscape as we face new, emerging challenges such as climate change. Our priorities are as follows:</p> <ul style="list-style-type: none"> <li>• <b><u>Resisting Rising Seas</u></b> As Singapore's coastal protection agency to protect Singapore from the threat of rising sea levels, PUB developed a national coastal protection master plan underpinned by Holistic Risk Assessment, Developing Adaptive and Flexible Pathways, and Integrated Planning.</li> <li>• <b><u>Increasing Energy Efficiency and Renewable Energy Generation</u></b> To reduce reliance on fossil fuels and mitigate the impacts of climate change, PUB is exploring technologies, such as biomimicry and pressure-retarded osmosis, to bring down the desalination energy requirement from the current 3.5 kWh/m<sup>3</sup> to close to 1 kWh/m<sup>3</sup> at the system level in the long term. We also launched one of the world's largest floating solar photovoltaic (PV) systems in Tengeh Reservoir and will be increasing our solar generation capabilities with new upcoming projects such as deployment at Pandan and Lower Seletar Reservoirs.</li> <li>• <b><u>Embracing Resource Circularity</u></b> The upcoming Tuas Nexus will harness potential synergies of the water-energy-waste nexus by integrating used water and solid waste treatment processes to maximise energy efficiency and generation, and resource recovery, while maintaining a small footprint.</li> <li>• <b><u>Transforming into a Smart Utility</u></b> The digital wave is affecting traditional business models globally, but it also presents immense opportunities. We are actively adopting suitable digital technologies to improve operational resilience and service delivery, such as the Smart Water Meter Programme.</li> </ul>

PUB has put in place a sustainability framework to guide our continuing efforts to ensure sustainable water supply for Singapore and to protect the country's coastline from rising sea levels. At the heart of this framework are our mission and vision.

It sets out the focus areas premised on four main pillars to ensure that PUB continues to deliver our mission responsibly. They are: (1) Water and Sustainable Management; (2) Capable and Engaged Workforce; (3) Strong Partnerships; and (4) Business Excellence.



## 2 Green Financing Framework

The Green Financing Framework (“**the Framework**”) is part the overall PUB’s sustainability framework. The Framework supports the financing of projects related to natural resource conservation, pollution prevention and control, and climate change mitigation. We aim to provide transparency, disclosure, integrity and quality in our Green Finance reporting. We follow the International Capital Market Association (“ICMA”) Green Bond Principles 2021 and ASEAN Capital Market Forum (“ACMF”) ASEAN Green Bond Standards 2018 (collectively referred to as “**Green Bond Standards**”), which have four components:

1. Use of proceeds
2. Process for project evaluation and selection
3. Management of proceeds
4. Reporting

### 3 Use of Proceeds

PUB's projects come under the following categories of the Green Bond Standards:

1. Sustainable water and wastewater management
2. Renewable energy

PUB will use the proceeds for each Green Bond issued to finance and refinance, in whole or part, projects that are in progress or future projects ("**Eligible Green Projects**"), with a two-year look-back period for refinancing projects.

The criteria of each project category for Eligible Green Projects are outlined in Table 1 below.

*Table 1: Eligible Green Projects for green bond issuance*

<b>Project Category</b>	<b>Project Sub-category</b>	<b>Criteria</b>
Sustainable water and wastewater management	<b>Water monitoring</b> <i>(e.g. water quality monitoring systems, used water monitoring systems)</i>	<ul style="list-style-type: none"> <li>• Net-zero or reduction in greenhouse gas ("GHG") emissions relative to business as usual ("BAU") baseline</li> <li>• Enables early detection and prompt intervention to prevent               <ol style="list-style-type: none"> <li>a) pollution of water sources</li> <li>b) water losses in system</li> </ol> </li> </ul>
Sustainable water and wastewater management	<b>Water collection, storage and distribution</b> <i>(e.g. stormwater management systems, water distribution systems)</i>	<ul style="list-style-type: none"> <li>• Net-zero or reduction in GHG emissions relative to BAU baseline</li> <li>• Prevent water losses</li> </ul>
Sustainable water and wastewater management	<b>Water treatment</b> <i>(e.g. water recycling systems, wastewater treatment systems)</i>	<ul style="list-style-type: none"> <li>• Net-zero or reduction in GHG emissions relative to BAU baseline</li> <li>• Prevent pollution of water sources</li> <li>• Conservation of resources through water recycling</li> <li>• Reduced waste generation</li> </ul>
Renewable energy	<b>Renewable energy</b> <i>(e.g. solar PV systems, biogas generators)</i>	<ul style="list-style-type: none"> <li>• Net-zero or reduction in GHG emissions relative to BAU baseline</li> </ul>

### 4 Governance Structure

The Sustainability Committee that is co-chaired by Deputy Chief Executives, with a number of Department Directors as committee members has overall responsibility for implementing this Framework. The main responsibilities include reviewing nominated Eligible Green Projects, updating the process to align the purpose of this Framework relevant to PUB business activities, and amending the scope of financial instruments covered by this Framework, and the eligibility for use of proceeds.

## 5 Process for project evaluation and selection

All PUB departments shall consider and nominate any Eligible Green Project(s) set out as described in Table 1 to the Sustainability Committee. For the nominated projects, an environmental screening will be carried out for projects that are located in biodiversity-sensitive areas, and where relevant Environmental impact assessments will also be conducted. Similarly, there is an assessment on the social impact of the project, and where relevant, stakeholder engagement is conducted as required on a project by project basis

The shortlisted projects will be reviewed by the Sustainability Committee to ensure that the nominated Eligible Green Project(s) meet the criteria under the Framework. All Eligible Green Projects will be reviewed by the Sustainability Committee and approved by the Chief Executive.

After such projects are approved and considered as an Eligible Green Project in accordance with this Framework, it will be earmarked for the use of proceeds under this Framework.

## 6 Management of proceeds

PUB will credit the proceeds of the bonds into a general account. Each green bond will be earmarked as of pending allocation, and with allocations being applied to existing or new Eligible Green Projects set out in Table 1 within 3 years.

PUB will also create a green bond register (“**Register**”) to monitor the allocation of the use of proceeds. The Register will contain (where applicable) the following information for each green bond issued:

- Identifier for the bond: Issuing entity, ISIN, transaction or listing date, principal amount outstanding, pricing (e.g. coupon/interest rate), repayment schedule or amortisation profile, maturity date.
- Allocation details: Eligible category (or categories), amount of investment, other relevant information so that the aggregate of issuance proceeds allocated to Eligible Green Projects is always recorded.

During the tenure of the issued green bonds, if any Eligible Green Project ceases to fulfil the requirements in Table 1, PUB will use its best efforts to reallocate the unused proceeds to replacement assets that comply with requirements of an Eligible Green Project as soon as reasonably practicable.

Where the allocation of proceeds is pending due to there being insufficient approved Eligible Green Projects at any given time during the tenor of the bond, PUB will deploy the proceeds at its own discretion in cash instruments in accordance with PUB’s approved cash investment policy in the interim.

Any unallocated amount will not be invested in any instruments, which may contribute to any carbon intensive activities or facilities.

## 7 Reporting

PUB will prepare a progress report on an annual basis until full allocation. This progress report will consist mainly information from the Register:

### 1. Allocation Reporting

- Amount of allocated proceeds by eligible category (as shown in first column of Table 1).
- Amount of allocated proceeds for financing and refinancing.
- Remaining balance of unallocated proceeds at the end of reporting period, if any.
- Description of green projects

### 2. Impact Reporting

Where relevant and applicable, PUB will report the impact of allocated Eligible Green Projects. Indicative impact indicators that may be used are as follows, and these are also publicly reported through PUB's Sustainability Report.

Table 2: List of indicative impact indicators that may be used in impact reporting

Project Category	Project Sub-category	Indicative Impact Indicators
Sustainable water and wastewater management	<b>Water monitoring</b> (e.g. water quality monitoring systems, used water monitoring systems)	<ul style="list-style-type: none"> <li>• GHG emissions avoided (tCO<sub>2</sub>e)</li> <li>• Sensor numbers / system coverage</li> </ul>
Sustainable water and wastewater management	<b>Water collection, storage and distribution</b> (e.g. stormwater management systems, water distribution systems)	<ul style="list-style-type: none"> <li>• GHG emissions avoided (tCO<sub>2</sub>e)</li> <li>• Number of leaks avoided</li> <li>• System distribution losses (%)</li> </ul>
Sustainable water and wastewater management	<b>Water treatment</b> (e.g. water recycling systems, wastewater treatment systems)	<ul style="list-style-type: none"> <li>• GHG emissions avoided (tCO<sub>2</sub>e)</li> <li>• Amount of wastewater treated (m<sup>3</sup>)</li> <li>• Recovery rate of wastewater recycling process (%)</li> <li>• Amount of waste avoided/reduced (kg or m<sup>3</sup>)</li> </ul>
Renewable energy	<b>Renewable energy</b> (e.g. solar PV systems, biogas generators)	<ul style="list-style-type: none"> <li>• GHG emissions avoided (tCO<sub>2</sub>e)</li> <li>• Amount of renewable energy generated (MWh)</li> </ul>

Where there are confidentiality concerns that limits the amount of details that can be made available, PUB may choose to present the information in generic terms or on an aggregated portfolio basis.



## 8 External review

### 8.1 Pre-Issuance Review

PUB has engaged an independent external reviewer to provide a Second Party Opinion on PUB's Green Financing Framework. This pre-issuance review is performed to confirm the alignment of this framework with the key features of the Green Bond Standards.

This review is done on a one-off basis, unless there are material changes to this Framework.

### 8.2 Post-Issuance Review

PUB will also engage an independent assurance provider on an annual basis to review its progress report – including the allocation of net proceeds and the impact of its green bonds. This annual review will commence a year from the issuance date of the first green bond, until the full allocation of the net proceeds.

Both the pre-issuance review and the annual review will be made available on [www.pub.gov.sg](http://www.pub.gov.sg).