



RATCH GROUP PUBLIC COMPANY LIMITED

SECOND PARTY OPINION

SUSTAINABLE FINANCE FRAMEWORK



**Document Title:**

Second Party Opinion on RATCH Group Public Company Limited Sustainable Finance Framework

**Prepared By:** DNV (Thailand) Co., Ltd.

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**Disclaimer**

Our assessment relies on the premise that the data and information provided by the client to us as part of our review procedures are provided in good faith. Because of the selected nature (sampling) and other inherent limitation of both procedures and systems of internal control, there remains the unavoidable risk that errors or irregularities, possibly significant, may not be detected. Limited depth of evidence gathering including inquiry and analytical procedures and limited sampling at lower levels in the organization were applied as per scope of work. DNV expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Statement.

**Statement of Competence and Independence**

DNV applies its own management standards and compliance policies for quality control, in accordance with ISO/IEC 17029:2019 - Conformity Assessment – General principles and requirements for validation and verification bodies, and accordingly maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. We have complied with the DNV Code of Conduct during the assessment and maintain independence where required by relevant ethical requirements.

## DNV'S INDEPENDENT ASSESSMENT

### Scope and Objectives

RATCH Group Public Company Limited ("RATCH" or the "Customer") is a Thailand-based energy and infrastructure holding company established in March 2000 and listed on the Stock Exchange of Thailand in November 2000. The company, in which the Electricity Generating Authority of Thailand (EGAT) holds a 45% stake, invests in conventional and renewable power generation projects aligned with national power development and energy security objectives in its operating countries. RATCH also invests in energy transition-related businesses and selected emerging sectors, including healthcare.

RATCH has developed a Sustainable Finance Framework ("Framework") with the aim to raise Sustainable Finance Instruments ("SFIs"), to finance or refinance new and existing projects as part of its sustainable business strategies and commitment to environmental well-being, as described in the Framework. The Framework is in alignment with the stated Principles and Standards (collectively the "Principles & Standards"):

- the Green Bond Principles ("GBP") and Social Bond Principles ("SBP") issued by the International Capital Market Association (ICMA) in June 2025, and Sustainability Bond Guidelines ("SBG") issued by ICMA in June 2021;
- the ASEAN Green Bond Standards ("GBS"), issued by the ASEAN Capital Markets Forum (ACMF) in October 2018 and;
- the Green Loan Principles ("GLP") and the Social Loan Principles ("SLP") issued by the Loan Market Association (LMA) in March 2025.

DNV (Thailand) Co. Ltd. ("DNV") has been commissioned by the RATCH to review its Framework and provide a Second Party Opinion on the Framework, based on the Principles & Standards.

Where applicable, reference is also made to eligibility criteria laid down in the following taxonomies:

- ASEAN Taxonomy Version 4 ("AT"), dated 6 November 2025
- Thailand Taxonomy ("TT"), as of May and July 2025

RATCH will ensure that any investment intended to be labelled as green will align with either the ASEAN Taxonomy or the Thailand Taxonomy, as applicable.<sup>1</sup>

Our methodology to achieve this is described under 'Work Undertaken' below. We were not commissioned to provide independent assurance or other audit activities.

### Responsibilities of the Management of RATCH and DNV

The management of RATCH has provided the information and data used by DNV during the delivery of this review. Our statement represents an independent opinion and is intended to inform RATCH management and other interested stakeholders in the bond as to whether the SFI is aligned with the Principles & Standards. In our work we have relied on the information and the facts presented to us by RATCH. DNV is not responsible for any aspect of the nominated assets referred to in this opinion and cannot be held liable if estimates, findings, opinions, or conclusions are incorrect. Thus, DNV shall not be held liable if any of the information or data provided by RATCH's management and used as a basis for this assessment were not correct or complete.

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<sup>1</sup> Email from RATCH, forwarded to DNV on 18 March 2026

## Basis of DNV's Opinion

We have adapted our assessment methodology to create the RATCH-specific Eligibility Assessment Protocol (henceforth referred to as "Protocol"). Our Protocol includes a set of suitable criteria that can be used to underpin DNV's opinion.

As per our Protocol, the criteria against which the Framework has been reviewed are grouped under the four core components:

### 1. Use of Proceeds

The Use of Proceeds criteria are guided by the requirement that an issuer of a bond or a borrower of a loan must use the funds raised to finance or refinance or to repay equity of eligible activities. The eligible activities should produce clear environmental and social benefits.

### 2. Process for Project Evaluation and Selection

The Project Evaluation and Selection criteria are guided by the requirements that an issuer of a bond or a borrower of a loan should outline the process it follows when determining eligibility of an investment using Sustainable Finance proceeds and outline any impact objectives it will consider.

### 3. Management of Proceeds

The Management of Proceeds criteria are guided by the requirements that an SFI should be tracked within the organisation, that separate portfolios should be created when necessary and that a declaration of how unallocated funds will be handled.

### 4. Reporting

The Reporting criteria are guided by the recommendation that at least annual reporting should be made of the use of proceeds and that quantitative and/or qualitative performance indicators should be used, where feasible.

No assurance is provided regarding the financial performance of instruments issued via the Framework, the value of any investments, or the long-term environmental benefits of the transaction. Our objective has been to provide an assessment that the Framework has met the criteria established on the basis set out below.

## Work Undertaken

Our work constituted a high-level review of the available information, based on the understanding that this information was provided to us by RATCH in good faith. We have not performed an audit or other tests to check the veracity of the information provided to us. The work undertaken to form our opinion included:

- Creation of a Protocol, adapted to the purpose of the bond, as described above and in Schedule 5 to this Assessment;
- Assessment of documentary evidence provided by RATCH on the bond and supplemented by a high-level desktop research. These checks refer to current assessment best practices and standards methodology;
- Review of published materials by RATCH and RATCH's website;
- Discussions with RATCH's management, and review of relevant documentation and evidence related to the criteria of the Protocol; and
- Documentation of findings against each element of the criteria.

Our opinion as detailed below is a summary of these findings.

## Findings and DNV's Opinion

DNV's findings on the alignment with Principles & Standards are listed below:

### 1. Use of Proceeds

RATCH intends to use the net proceeds of the SFIs to finance or refinance in whole or in part any eligible Green and/or Social Projects.

The Framework defines the following eligible project categories:

- Renewable Energy
- Energy Efficiency
- Alternative Aviation Fuel
- Clean Transportation
- Water Management
- Access to Essential Services
- Employment Generation and Socioeconomic Advancement

DNV undertook an assessment of the associated project types to determine their eligibility as Sustainable and their alignment with the Principles & Standards. DNV concludes that the eligible categories outlined in the Framework are consistent with the categories referenced in the Principles & Standards.

### 2. Process for Project Evaluation and Selection

RATCH's Sustainable Finance Working Group ("Working Group"), with members from Sustainability, Finance, Business Units, Risk, and Legal, selects and annually reviews eligible Green and Social Projects. It ensures compliance with laws and company policies, oversees annual allocation and reporting, and assesses climate, environmental, and social risks. The Financial Planning Department validates final proceeds allocation.

DNV concludes that RATCH's Framework appropriately describes the process for Project Evaluation and Selection.

### 3. Management of Proceeds

RATCH issues SFIs tied to eligible projects, with the Working Group tracking and allocating proceeds through a dedicated internal account. Proceeds are monitored and adjusted over time, with replacements made if projects become ineligible. Unallocated funds may be temporarily invested, and RATCH aims to fully allocate proceeds within 36 months. Any interest earned may be used to cover project or administration costs.

DNV has reviewed the evidence presented and concludes that the Framework appropriately describes the process for Management of Proceeds.

### 4. Reporting

RATCH will publish annual allocation and impact reporting from one year after issuance until full allocation (and impact reporting until maturity), making reports available to lenders or on its website. Reporting will include allocation details, project examples, and information such as allocation percentages, financing/refinancing splits, project descriptions, and unallocated balances. Annual impact reporting will cover estimated environmental and social outcomes, including pro-rata impacts for co-financed projects, along with the methodologies and assumptions used.



Based on the limited assurance procedures conducted, nothing has come to our attention that causes us to believe that the Framework is not, in all material respects, in accordance with the Pre-Issuance requirements of the Principles & Standards.

**For DNV (Thailand) Co., Ltd.**

Bangkok, Thailand / 19 March 2026

A handwritten signature in blue ink that reads "Kobrat C".

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Kobrat Chotruangprasert  
**Quality Reviewer**

A handwritten signature in black ink that reads "Thomas Leonard".

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Thomas Leonard  
**Lead Verifier**

## Schedule 1. Description of Categories to be financed or refinanced through the Customer’s Sustainable Finance Instruments

Eligible Green Project Categories	Eligible Criteria and Description	DNV Findings
Renewable Energy	Development, installation, operation and connection of renewable energy, including:	Where applicable, activity must align with technical screening criteria (“TSC”) in the one or both of the following taxonomies; namely AT Plus Standards (“PS”) or TT. In all cases, eligibility is dependent on conformity with Do No Significant Harm (“DNSH”) and Social Aspects, as set out in Schedule 3.
	Wind power	<p>Electricity generation by wind power is eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Energy Sector               <ul style="list-style-type: none"> <li>○ 351[030] Electricity generation from wind power</li> </ul> </li> <li>• TT: Energy Sector               <ul style="list-style-type: none"> <li>○ 2. Wind energy generation</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT and TT.</p>
	Solar power	<p>Electricity generation by solar power is eligible where it complies with either or both of the following:</p> <ul style="list-style-type: none"> <li>• AT: Electricity, Gas, Steam and Air Conditioning Supply Sector               <ul style="list-style-type: none"> <li>○ 351[021] Electricity generation using solar photovoltaic technology</li> <li>○ 351[022] Electricity generation using CSP technology</li> </ul> </li> <li>• TT: Energy Sector               <ul style="list-style-type: none"> <li>○ 1. Solar energy generation</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT and TT.</p>
	Biomass power: <ul style="list-style-type: none"> <li>• Only eligible when facilities produce GHG emissions that are below 100gCO<sub>2</sub>e/kWh from industrial waste wood as fuel to produce electricity.</li> </ul>	<p>Electricity generation by bioenergy is eligible where it complies:</p> <ul style="list-style-type: none"> <li>• AT: Electricity, Gas, Steam and Air Conditioning Supply Sector               <ul style="list-style-type: none"> <li>○ 351[014] Electricity generation from bioenergy, including co-firing with fossil fuels</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT.</p>
	Hydropower: Plant that meets criteria (1) OR (2) OR (3) <ol style="list-style-type: none"> <li>1. The electricity generation facility is a run-of-river</li> </ol>	<p>Electricity generation by hydropower is eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Electricity, Gas, Steam and Air Conditioning Supply Sector</li> </ul>

	<p>plant and does not have an artificial reservoir;</p> <ol style="list-style-type: none"> <li>2. Power density of the electricity generation facility is above 5W/m<sup>2</sup>;</li> <li>3. Lifecycle GHG emissions from the generation of electricity by the entire facility &lt;100gCO<sub>2</sub>e/kWh.</li> </ol>	<ul style="list-style-type: none"> <li>○ 351[040] Electricity generation from hydropower</li> </ul> <p>Activity meets the eligibility TSC for AT.</p>
<p>Energy Efficiency (Demand Side Efficiency)</p>	<p>Energy efficiency improvements on the energy consumption side, including investments or expenditures aimed at reducing energy use in buildings, industrial processes, and operational systems. This may include the development, construction, installation, and maintenance of energy storage systems and other technologies that help optimise energy consumption and improve overall energy efficiency.</p>	<p>Electricity generation by green hydrogen is eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Electricity, Gas, Steam and Air Conditioning Supply Sector <ul style="list-style-type: none"> <li>○ 351[012] Electricity generation from renewable non-fossil gaseous and liquid fuels, including co-firing with fossil fuels</li> </ul> </li> <li>• TT: Energy Sector <ul style="list-style-type: none"> <li>○ 8. Electricity generation from renewable non-fossil gaseous and liquid fuels, including green hydrogen</li> </ul> </li> </ul> <p>Manufacture of low-carbon gases, including hydrogen where it complies with:</p> <ul style="list-style-type: none"> <li>• AT: Manufacturing Sector <ul style="list-style-type: none"> <li>○ 2011[001] Manufacture of low-carbon gases, including hydrogen</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT and/or TT as applicable.</p>
		<p>Specific demand side electricity efficiency measures are eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Construction and Real Estate Sector <ul style="list-style-type: none"> <li>○ 68[002] Energy efficient equipment</li> <li>○ 68[003] Energy performance measurement, regulation, control</li> <li>○ 68[004] Renewable Technologies</li> </ul> </li> <li>• TT: Construction and Real Estate Sector <ul style="list-style-type: none"> <li>○ 4. Installation, maintenance, and repair of special-purpose building equipment</li> </ul> </li> </ul> <p>Note that the AT PS and TT refer to buildings, as opposed to industrial processes. However, specific efficiency improvements to industrial processes may also be considered Green in accordance with the AT Foundation Framework ("FF"), as described in Schedule 2.</p> <p>Activity meets the eligibility TSC for AT and/or TT as applicable.</p>

<sup>2</sup> <https://bigth.com/en/big-and-ratch-group-to-drive-green-hydrogen-development/>

<p>Energy Efficiency (More efficient Transmission &amp; Distribution)</p>	<p>Projects aimed at improving the efficiency of electricity transmission and distribution networks, including investments that enhance network performance, reduce electricity grid losses, and improve the reliability and efficiency of power delivery systems.</p>	<p>Specific T&amp;D measures are eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Electricity, Gas, Steam and Air Conditioning Supply Sector <ul style="list-style-type: none"> <li>○ 351[071] Transmission and distribution (T&amp;D) of electricity (Clause 2.c., relating to the implementation or operation of equipment and infrastructure which is intended to increase the controllability and observability of the System and to enable the development and integration of Green power generation):</li> <li>○ 351[072] Storage of electricity, including pumped storage</li> </ul> </li> </ul> <p>Specific efficiency improvements to transmission and distribution equipment may also be considered Green in accordance with the AT FF, as described in Schedule 2.</p> <p>Activity meets the eligibility TSC for AT.</p>
<p>Energy Efficiency (Efficient Data Transmission and Processing)</p>	<p>Investments in digital infrastructure designed to improve the efficiency of data transmission and processing, including the installation of fibre optic networks, the development of energy-efficient data centres, and related equipment.</p> <p>Eligible projects include data centres that meet the following criteria:</p> <p>The activity complies with the following criteria ((1), (2) OR (3)) AND criteria (4), (5), (6) AND (7).</p> <p>(1) For large sized data centres with &gt;20 MW power capacity:</p> <p style="margin-left: 40px;">a. For newly designed facilities, the design Power Usage Effectiveness (PUE) to refer to the corresponding IT load:</p> <p style="margin-left: 80px;">i. 1.28 at 100% IT load;</p>	<p>Data centres are eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Information and Communication <ul style="list-style-type: none"> <li>○ 631[001] Data processing, hosting and related activities; web portals</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT.</p>

	<ul style="list-style-type: none"> <li>ii. 1.39 at 25% IT load; OR</li> <li>b. For existing facilities, the annualised operational PUE should be less than 1.3; OR</li> </ul> <p>(2) For medium sized data centres with 1 - 20 MW power capacity:</p> <ul style="list-style-type: none"> <li>a. For newly designed facilities, the design PUE to refer to the corresponding IT load: <ul style="list-style-type: none"> <li>i. 1.35 at 100% IT load;</li> <li>ii. 1.50 at 25% IT load; OR</li> </ul> </li> <li>b. For existing facilities, the annualised operational PUE should be less than 1.4; OR</li> </ul> <p>(3) For small sized data centres with &lt;1 MW power capacity:</p> <ul style="list-style-type: none"> <li>a. For newly designed facilities, the design PUE to refer to the corresponding IT load: <ul style="list-style-type: none"> <li>i. 1.45 at 100% IT load;</li> <li>ii. 1.6 at 25% IT load; OR</li> </ul> </li> <li>b. For existing facilities, the annualised operational PUE should be less than 1.5; AND</li> </ul> <p>(4) With respect to refrigerants used in the data centres cooling system:</p> <ul style="list-style-type: none"> <li>a. Global Warming Potential (GWP) must not exceed 675; OR</li> <li>b. Cooling system must incorporate leak prevention measures, achieving an annual</li> </ul>	
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	<p>refrigerant leakage rate of less than 2% of total charge, verified through ISO 5149-compliant design, installation, and maintenance practices; AND</p> <p>(5) If the project includes the construction of a newly designed facility or retrofit of existing buildings, the facility must achieve an advanced level of certification from a credible national or international Green Building Certification (GBC) scheme; AND</p> <p>(6) The implementation of those practices is verified by an independent third-party and audited at least every three years. Re-certification has to be obtained every three years; AND</p> <p>The Water Usage Effectiveness (WUE) of the data centres should be no more than 2.0 m<sup>3</sup>/MWh/year.</p>	
Alternative Aviation Fuel	Sustainable Aviation Fuel ("SAF"): Eligible projects include the production of SAF that meets the sustainability criteria under CORSIA-recognised certification schemes.	<p>Sustainable aviation fuel is eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• TT: Energy Sector <ul style="list-style-type: none"> <li>○ 5. Bioenergy generation and production (including SAF)</li> </ul> </li> <li>• AT: Whilst not technically a refined petroleum product, SAF may be assessed under AT activity 192[001], which explicitly includes products made using feedstock from biomass.</li> </ul> <p>Activity meets the eligibility TSC for AT and/or TT as applicable.</p>
Clean Transportation	Engineering design and construction, machinery and electrical systems, operation and maintenance of green transport projects, which promote clean transport services and modal shift towards public transportation, including Mass	<p>Land transportation is eligible where it complies with either or both of:</p> <ul style="list-style-type: none"> <li>• AT: Transportation and Storage Sector <ul style="list-style-type: none"> <li>○ 49[001] Infrastructure for road and public transportation, including infrastructure to enable low-carbon land transport</li> <li>○ 49[002] Infrastructure for personal mobility, cycle logistics</li> </ul> </li> </ul>

	<p>Rail Transport systems and Electric Vehicle infrastructure.</p>	<ul style="list-style-type: none"> <li>○ 491[001] Infrastructure for rail transport</li> <li>○ 4911[001] Passenger interurban rail transport</li> <li>○ 4912[001] Freight rail transport</li> <li>○ 492[001] Urban and suburban transport, road passenger transport</li> <li>○ 492[002] Transport by motorbikes, passenger cars and light commercial vehicles</li> <li>○ 492[003] Operation of personal mobility devices, cycle logistics</li> <li>○ 4923[001] Freight transport services by road</li> <li>• TT: Transportation Sector <ul style="list-style-type: none"> <li>○ 1. Transport via railways</li> <li>○ 2. Other passenger land transport</li> <li>○ 3. Urban and suburban passenger land transport</li> <li>○ 4. Freight transport by road</li> <li>○ 5. Enabling infrastructure for low-emission transport</li> </ul> </li> </ul> <p>Activity meets the eligibility TSC for AT and/or TT as applicable.</p>
<p>Water Management</p>	<p>Improvement in water supply infrastructure in order to increase efficiency and accessibility of water delivery system.</p>	<p>Water management is eligible where it complies with:</p> <ul style="list-style-type: none"> <li>• AT: Water Supply, Sewerage, Waste Management, and Remediation Sector <ul style="list-style-type: none"> <li>○ 36[001] Construction, extension and operation of water collection, treatment and supply systems</li> <li>○ 36[002] Renewal of water collection, treatment and supply systems</li> </ul> </li> </ul> <p>Specific efficiency improvements to water management facilities may also be considered Green in accordance with the AT FF, as described in Schedule 2.</p> <p>Activity meets the eligibility TSC for AT.</p>

Eligible Social Project Categories	Eligible Criteria and Description	DNV Findings
<p>Access to Essential Services</p>	<ul style="list-style-type: none"> <li>• Financing to construct, equip, and operate hospitals, clinics, and healthcare centres for the provision of public or subsidised health services.</li> <li>• Financing the development and maintenance of basic public infrastructure such as electricity distribution in remote</li> </ul>	<p>Activity meets the applicable eligibility requirements of the Principles &amp; Standards.</p>

	areas, clean water and sanitation systems, and rural road networks to enhance accessibility and social inclusion.	
Employment Generation and Training	Programmes for employment generation and unemployment prevention or enabling green activities e.g., Education for Career Empowerment Project.	Activity meets the applicable eligibility requirements of the Principles & Standards.

**Exclusion Criteria (if relevant)**

RATCH’s financing proceeds shall not be utilised towards the following activities:

- Fossil fuel power generation projects
- Child labour
- Forced labour

Do No Significant Harm (“DNSH”) and Social Aspects are covered in Schedule 3.

## Schedule 2. Application of the Foundation Framework

Energy efficiency improvements may be assessed as green if they meet the requirements shown in the EO1 (Climate Change Mitigation) as shown below.

### EO1 guiding questions applied to energy efficiency improvements

Scope covered:

- Industrial processes (e.g., motors, drives, furnaces, compressed air, process heat, controls/automation, waste heat recovery, task lighting for production areas).
- Electricity transmission & distribution (T&D) (e.g., high efficiency transformers, reconductoring, reactive power compensation, voltage optimisation, digitalisation, SF<sub>6</sub> leakage mitigation).
- Water management: (e.g., high-efficiency pumps and variable speed drives ("VSDs"); pressure optimisation; leak detection and non-revenue water ("NRW") reduction; smart metering; pipeline rehabilitation to reduce friction losses).

### Note

*Targeted efficiency measures may be considered green activities in themselves where they verifiably reduce energy use/losses and GHG emissions. This does not mean the entire facility or system becomes a green activity.*

Section 1A or Section 1B must be fulfilled.

### Section 1A – Does the Activity avoid / reduce GHG emissions?

1. How does the Activity avoid or help reduce emissions?

- Industrial processes:
  - Examples: high efficiency motors and variable speed drives ("VSDs"); process controls/automation; efficient boilers/furnaces and heat exchangers; waste heat recovery; optimised compressed air; LED/task lighting for production areas.
  - Evidence: pre/post energy data; engineering calculations; defined baseline; apply emission factors to electricity and fuels.
- Electricity T&D:
  - Examples: installing higher efficiency transformers; reconductoring to reduce line losses; dynamic line rating; capacitor banks/STATCOMs; voltage optimisation; advanced distribution automation.
  - Evidence: modelled and measured loss reductions; feeder/substation energy balance; apply grid emission factors.
- Water management:
  - Examples: High-efficiency pumps and VSDs; Pressure optimisation and pressure zoning; Leak detection and reduction of non-revenue water; Smart water metering; Pipeline rehabilitation to reduce friction losses.
  - Evidence: Baseline water loss levels and pump energy intensity (kWh/m<sup>3</sup>); Metered savings from leak reduction and pump upgrades; Emission factors applied to electricity use for pumping.

1(a). Does the Activity avoid locking in high carbon activity?

- Industrial processes:
  - Avoid upgrades that extend the life of carbon intensive configurations without a credible transition pathway.

- Prefer solutions compatible with electrification/low carbon fuels (e.g., controls enabling future heat pump integration).
- Electricity T&D:
  - Enable higher renewable penetration and grid flexibility; avoid unnecessary dependence on SF<sub>6</sub> where alternatives exist.
- Water management:
  - Avoid extending or reinforcing inefficient fossil-powered pumping configurations.
  - Prefer systems that are compatible with future low-carbon electricity supply (e.g., pumps designed for flexible operation with solar-powered pumping).
  - Avoid long-term lock-in of high-pressure systems where lower-pressure districting is viable.

*1(b). Does the Activity avoid leading to significant GHG emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, NF<sub>3</sub>, HFCs)?*

- Industrial processes:
  - Minimise/replace high GWP refrigerants and process gases; control fugitive emissions; ensure proper end of life management.
- Electricity T&D:
  - Prioritise low loss, low SF<sub>6</sub> designs; implement SF<sub>6</sub> leak detection/monitoring/recovery; track leak rate (%/yr or kg/MVA yr).
  - Fugitive emissions must not offset savings; include lifecycle and maintenance controls.
- Water management:
  - Reduce fugitive emissions from energy-intensive pumping and treatment.
  - Minimise leaks that indirectly drive higher pumping and treatment loads.
  - Ensure maintenance practices prevent contamination events requiring re-pumping or re-treatment.

*1(c). Does the Activity avoid leading to extensive deforestation?*

- Industrial processes:
  - Execute upgrades within the existing industrial footprint; if expansion is unavoidable, demonstrate no deforestation siting and biodiversity safeguards.
- Electricity T&D:
  - Prefer upgrades within existing rights-of-way; for new rights-of-way, demonstrate avoidance/minimisation/offsets and ecological management.
- Water management:
  - Use existing corridors for pipeline replacement.
  - Demonstrate avoidance/minimisation of land clearing for new pipelines, reservoirs, or pumping stations.
  - Employ biodiversity safeguards for new water infrastructure.

*2. Do the Company's policies and business strategy avoid contradicting EO1 principles?*

- Industrial processes:
  - Provide a decarbonisation roadmap/net zero targets; energy management policy (e.g., ISO 50001); plan to phase down high GWP gases; capex aligned to transition.
- Electricity T&D:
  - Grid decarbonisation strategy; loss reduction program; SF<sub>6</sub> phase down/alternatives assessment; digitalisation roadmap enabling RE integration.
- Water management:
  - Water utility decarbonisation strategy (e.g., targets for energy intensity reduction).
  - NRW reduction strategy with measurable targets.
  - Adoption of smart water management policies enabling energy optimisation.
  - Commitment to renewable-powered pumping, where feasible.

Refer to Schedule 3 Do-No-Significant-Harm for more detailed assessment.

3. *Is there 3rd party certification or verification of alignment with EO1?*

- Industrial processes:
  - Independent measurement and verification (“M&V”); assurance per GHG Protocol/ISO 14064; sector standards as relevant.
- Electricity T&D:
  - Independent loss reduction M&V; grid code compliance certification; SF<sub>6</sub> leakage audits; project level assurance.
- Water management:
  - Independent verification of NRW reduction; Energy performance audits for pumping systems; Certification of metering accuracy and smart water network commissioning; Assurance of GHG savings from reduced pumping energy or leakage reduction.

4. *Does the Activity fulfil relevant environmental law(s) applicable to EO1?*

- Industrial processes:
  - Compliance with air emissions, safety, waste, refrigerant handling, hazardous substances, and energy efficiency regulations; updated permits.
- Electricity T&D:
  - Compliance with grid codes, safety, EMF, SF<sub>6</sub> handling/reporting, environmental permits; procurement meeting minimum efficiency standards.
- Water management:
  - Compliance with water abstraction permits, discharge regulations, water quality standards, and leakage performance obligations; compliance with environmental impact assessment requirements for pipeline works; adherence to drinking water and wastewater treatment standards.

5. *Are mitigation effects measurable and observable?*

- Industrial processes:
  - Examples: Define baseline (e.g., 12-month normalised pre data); M&V plan; metering points; report kWh/GJ saved and tCO<sub>2e</sub> avoided; include uncertainties and persistence (degradation, rebound).
- Electricity T&D:
  - Examples: Feeder/substation energy balance before/after; reconcile model to meter; report technical loss reduction (MWh) and tCO<sub>2e</sub> avoided; track SF<sub>6</sub> leak trend; include seasonality/load effects.
- Water management:
  - Examples: Measurement of energy intensity before/after implementation (kWh/m<sup>3</sup>); leak volume reduction (m<sup>3</sup>/day) and resulting energy savings (kWh); pump performance curves, specific energy (kWh/m<sup>3</sup>) data; smart metering analytics showing reductions in NRW; calculation of tCO<sub>2e</sub> avoided through reduced pumping or treatment.

**Section 1B — Does the Activity enable other stakeholders and/or other Activities to mitigate climate change?**

1. *Does the Activity help other stakeholders mitigate climate change?*

- Industrial processes:
  - Examples: Efficiency frees site electrical capacity for onsite renewables or EV charging; waste heat can supply nearby users.
- Electricity T&D:
  - Loss reduction/reactive power control increase hosting capacity for distributed solar/storage; improved reliability reduces backup diesel usage by customers.
- Water management:

- Reduced leaks lower the regional energy demand for water supply, reducing pressure on the grid; improved reliability reduces customer reliance on diesel generators for water supply; smart metering enables consumers to reduce water and energy use.

*1(a). Does the Activity avoid impeding upstream/downstream stakeholders from reducing GHGs?*

- Industrial processes:
  - Avoid solutions that increase process rigidity or lock in fossil heat; ensure interoperability with future low carbon fuels/electrification.
- Electricity T&D:
  - Avoid configurations limiting RE interconnection (e.g., unaddressed voltage constraints) or unnecessarily increasing SF<sub>6</sub> dependence.
- Water management:
  - Avoid water system designs that prevent future integration of renewable-powered pumping; avoid excessive pressure zones that increase downstream energy requirements for customers (e.g., PRVs enabling lower pressures); maintain compatibility with smart-city systems and future water reuse.

*2. Does the Activity promote intersectoral collaborations for mitigation?*

- Industrial processes:
  - Examples: Industry–utility demand response; heat sharing with nearby facilities; pilots with technology providers for deep retrofits.
- Electricity T&D:
  - Examples: Utility–developer programs for distributed energy resources (“DER”) integration; dynamic line rating pilots with renewable IPPs; city programs to reduce diesel genset reliance.
- Water management:
  - Examples: Collaborative water-energy initiatives including energy-efficient pumping, integrated water-energy modelling, coordinated water-loss reduction, and solar-powered pumping optimisation.

*3. How does the Activity enable other Activities to mitigate climate change?*

- Industrial processes:
  - Examples: Controls/metering to optimise cross process energy flows; demand flexibility enabling participation in grid decarbonisation.
- Electricity T&D:
  - Examples: Grid digitalisation enabling solar/wind integration, non-wires alternatives, and voltage control to avoid curtailment.
- Water management:
  - Examples: Smart networks enabling demand-side water management and reduced treatment energy; pressure optimisation enabling reduced pipe burst frequency, lowering embodied carbon in repairs; efficiency improvements freeing electricity grid capacity; monitoring systems enabling rapid leak control and avoided emissions.

*4. Are the enabling effects measurable and observable?*

- Industrial processes:
  - Examples: Track freed electrical capacity (kVA), demand response (kW), onsite RE added (kWp) enabled by the measure.
- Electricity T&D:
  - Examples: Track hosting capacity increase (MW), curtailment reduction (MWh), and additional RE connected (MW/MWh) attributable to the measure.
- Water management:
  - Examples: Reduction in NRW (%) and leakage (m<sup>3</sup>/day); change in specific energy for pumping (kWh/m<sup>3</sup>); renewable pumping capacity added (kW/kWh); decrease in burst

frequency correlating with pressure management; water savings and corresponding tCO<sub>2e</sub> avoided.

## Schedule 3. Do No Significant Harm and Social Aspects

In the absence of actual projects, and given that all proposed eligible project categories are theoretical in nature, DNV is unable to perform a DNSH assessment at the activity level. Consequently, DNV is conducting the DNSH assessment at the corporate level.

The following analysis is based on the RATCH Group Environmental and Social Policy<sup>3</sup>, Climate Strategy<sup>4</sup> and Sustainability Report<sup>5</sup>.

### *1. Energy and Environmental Management Policies*

RATCH maintains policies focused on conducting business with environmental responsibility and resource efficiency. These policies provide the foundational practices for monitoring, managing, and reducing environmental impacts across operations.

These commitments support Taxonomy DNSH safeguards by ensuring:

- Efficient and responsible energy use, reducing overall environmental burden.
- Systems to manage emissions, waste, and resource consumption.
- Processes designed to prevent environmental harm during routine operations.

### *2. Climate Change Management Policies*

RATCH's policy emphasises using innovation and technology to improve environmental quality and operational efficiency.

These policies support DNSH by:

- Recognition and activities associated with improving adaptation and resilience.
- Ensuring investments prioritise eco-friendly technology to avoid new climate-related vulnerabilities.
- Incorporating continuous improvement and adaptation into project decisions.
- Reinforcing the importance of mitigating environmental impacts to support long-term climate resilience.

### *3. Air Quality and Noise Management Policies*

Policies reflect RATCH's commitment to protecting surrounding communities and ecosystems from operational outputs.

These policies help support DNSH by ensuring:

- Monitoring and reporting on noise levels in operating plants.
- Emissions remain within acceptable legal and environmental thresholds.
- Operational impacts do not significantly harm human health or biodiversity.
- Environmental performance is continually monitored and evaluated.

### *4. Waste Management Policies*

RATCH's policy focuses on environmental protection and restoration, which includes managing waste.

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<sup>3</sup> <https://www.ratch.co.th/en/corporate-governance/corporate-policies/397/corporate-social-responsibility-policy>

<sup>4</sup> <https://www.ratch.co.th/en/environment/climate-strategy>

<sup>5</sup> <https://www.ratch.co.th/storage/content/investor-relations/downloads/sustainability-report/sustainability-report-2024-en.pdf>

These policies help support DNSH by ensuring:

- Establishment of efficient procedures to handle unused production materials, that emphasise maximum reuse through repairing or recycling.
- Supporting responsible resource management.
- Monitoring and reporting on disposal of contaminated material in operating plants.
- Ensuring hazardous materials and waste are properly controlled.

#### *5. Water Resource Management Policies*

Policies for water use and management demonstrate efforts to prevent depletion or contamination of water resources.

These policies support DNSH by:

- Encouraging efficient water use.
- Measures to avoid contamination to water.

#### *6. Environmental and Social Management System (ESMS)*

Policies reflect RATCH's commitment to protecting surrounding communities and ecosystems from operational outputs.

These policies help support DNSH by ensuring:

- Emissions and noise remain within acceptable legal and environmental thresholds.
- Operational impacts do not significantly harm human health or biodiversity.
- Environmental performance is continually monitored and evaluated.

#### *7. Governance, Anti-Corruption, and Social Safeguard Policies*

The CSR policy includes dedicated sections on human rights, fair treatment, and anti-corruption, providing the social safeguard foundation expected under the ASEAN Taxonomy.

These policies contribute to Social Aspects by ensuring that:

- Community impacts are considered and managed.
- Human rights risks are mitigated through a commitment to fair treatment for all stakeholders.
- Economic activities are conducted responsibly and transparently.

## Schedule 4. Contributions to UN SDGs

Eligible Project Categories	UN SDGs	DNV Findings
Renewable Energy	<ul style="list-style-type: none"> <li>SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix</li> <li>SDG 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities</li> </ul>	<p>DNV is of the opinion that the eligible category outlined in the Framework contributes to the achievement of the UN SDGs.</p>
Energy Efficiency	<ul style="list-style-type: none"> <li>SDG 7.3: By 2030, double the global rate of improvement in energy efficiency</li> </ul>	
Alternative Aviation Fuel	<ul style="list-style-type: none"> <li>SDG 12.2: By 2030, achieve the sustainable management and efficient use of natural resources</li> </ul>	
Clean Transportation	<ul style="list-style-type: none"> <li>SDG 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</li> </ul>	
Water Management	<ul style="list-style-type: none"> <li>SDG 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.</li> </ul>	

## Schedule 5. Eligibility Assessment Protocol

### 1. Use of Proceeds

Ref.	Criteria	Requirements	DNV Findings
1a	Type of Bond /Loan	<p>The Bond/Loan must fall in one of the following categories, as defined by the Principles &amp; Standards:</p> <ul style="list-style-type: none"> <li>• Sustainable Use of Proceeds Bond</li> <li>• Sustainable Use of Proceeds Revenue Bond</li> <li>• Sustainable Project Bond</li> <li>• Sustainable Securitised Bond</li> <li>• Loan instrument made available for Sustainable project (Sustainable use of loan proceeds)</li> </ul>	<p>The Framework states that that RATCH intends to issue SFIs, here an amount equivalent to the net proceeds is exclusively allocated to eligible green and/or social projects. The Framework is explicitly developed in alignment with the Principles &amp; Standards.</p> <p>The reviewed evidence confirms that the SFIs meet the criteria under the Principles &amp; Standards, and DNV confirms this process to be aligned with the Principles &amp; Standards.</p>
1b	Sustainable Project Categories	<p>The cornerstones of Sustainable Bonds and Loans are the utilisation of the proceeds of the bonds or the loans which should be appropriately described in the legal documentation for the security.</p>	<p>Eligible project category presented by RATCH are/is as follows:</p> <ul style="list-style-type: none"> <li>• Renewable Energy</li> <li>• Energy Efficiency</li> <li>• Alternative Aviation Fuel</li> <li>• Clean Transportation</li> <li>• Water Management</li> <li>• Access to Essential Services</li> <li>• Employment Generation and Training</li> </ul> <p>The Framework specifies that renewable energy technologies, such as hydropower and biomass, reference relevant market-based and official taxonomies, to support eligibility determinations and to ensure alignment with regional classification systems.</p> <p>The above-mentioned project category meets the eligible green and social project categories in the Principles &amp; Standards. DNV confirms this to be aligned with the Principles &amp; Standards.</p>
1c	Environmental or social Benefits	<p>All designated Sustainable Project categories should provide clear environmentally or socially sustainable benefits, which, where feasible, will be quantified or assessed by the Issuer.</p>	<p>The Framework states that the Eligible Green Project Categories are intended to generate positive environmental outcomes, including increased renewable energy generation, reductions in greenhouse gas emissions, improved energy system performance, and enhanced resource efficiency.</p> <p>DNV confirms that the proposed use of proceeds will reasonably be expected to deliver meaningful environmental benefits.</p>

1d	Refinancing Share	<p>In the event that a proportion of the proceeds may be used for refinancing, it is recommended that issuers provide an estimate of the share of financing vs. re-financing, and where appropriate, also clarify which investments or project portfolios may be refinanced.</p>	<p>The Framework states that the net proceeds of SFI may be used to finance or refinance, in whole or in part, eligible green and/or social projects. It further specifies that financing may include new projects with disbursements after the issuance of the SFI or existing projects with commercial operation or acquisition closing prior to issuance.</p> <p>The proposed management of net proceeds from the SFI is confirmed by DNV to reasonably be expected to meet the criteria under the Principles &amp; Standards.</p>
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## 2. Process for Project Selection and Evaluation

Ref.	Criteria	Requirements	DNV Findings
2a	Investment-Decision Process	<p>The Issuer of a Sustainable Bond and Loan should outline the decision-making process it follows to determine the eligibility of projects using Sustainable Bond and Loan proceeds. This includes, without limitation:</p> <ul style="list-style-type: none"> <li>• The environmental objectives of the eligible Sustainable Projects;</li> <li>• The process by which the issuer determines how the projects fit within the eligible Sustainable Projects categories; and</li> <li>• Complementary information on processes by which the issuer identifies and manages perceived environmental and social risks associated with the relevant project(s).</li> </ul>	<p>The Framework states that RATCH has established a Sustainable Finance Working Group (“Working Group”) responsible for the selection, evaluation, and approval of eligible green and/or social projects to be financed or refinanced through SFI.</p> <p>The Working Group comprises representatives from Group Sustainability, Finance, Business Units, the Business Risk Organisation, and Legal Functions. It evaluates projects against the defined eligible green and/or social categories and ensures alignment with the Company’s environmental and social objectives, including climate mitigation, energy transition, community commitment, human rights, and sustainable supply chain practices. The Working Group also undertakes an analysis of climate-, environmental- and social-related risks for each investment decision and reviews project eligibility and allocation on an annual basis.</p> <p>DNV confirms this process for project selection and evaluation to be aligned with the Principles &amp; Standards.</p>
2b	Issuer/Borrower’s Environmental and Governance Framework	<p>Issuers are also encouraged to:</p> <ul style="list-style-type: none"> <li>• Position the relevant information within the context of the issuer’s overarching objectives, strategy, policy and/or processes relating to environmental sustainability.</li> <li>• Provide information, if relevant, on the alignment of projects with official</li> </ul>	<p>The Framework states that RATCH’s sustainability approach is guided by established corporate-level policies, including its Corporate Sustainability Policy and Environmental &amp; Social Policy, which define objectives relating to climate change mitigation, responsible resource management, sustainable supply chains, ecosystem protection, and social responsibility.</p>

		<p>or market-based taxonomies, related eligibility criteria</p> <ul style="list-style-type: none"> <li>• Have a process in place to identify mitigants to known material risks of negative environmental and/or social impacts from the relevant project(s).</li> </ul>	<p>The Framework positions SFI within this broader strategic context and links eligible projects to RATCH’s environmental, social, and economic pillars, net-zero pathway, and long-term sustainability goals.</p> <p>RATCH has established an Environmental and Social Management System (ESMS) to identify, assess, and manage environmental and social risks. Oversight is provided through the Company’s ESG-related governance committees. This structure ensures that potential negative impacts are assessed, mitigated, and monitored throughout the lifecycle of eligible green and/or social projects.</p> <p>DNV confirms that RATCH’s ESG strategies and grouping of projects with eligibility criteria are aligned with the Principles &amp; Standards.</p>
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### 3. Management of Proceeds

Ref.	Criteria	Requirements	DNV Findings
3a	Tracking Procedure	<ul style="list-style-type: none"> <li>• (Bond) The net proceeds of Sustainable Bonds should be credited to a sub-account, moved to a sub- portfolio or otherwise tracked by the Issuer in an appropriate manner and attested to by a formal internal process that will be linked to the Issuer’s lending and investment operations for Sustainable Projects.</li> <li>• (Loan) The proceeds of Sustainable Loans should be credited to a dedicated account or otherwise tracked by the borrower in an appropriate manner, so as to maintain transparency and promote the integrity of the product. Where a green loan takes the form of one or more tranches of a loan facility, each green tranche(s) must be clearly designated, with proceeds of the green tranche(s) credited to a separate account or tracked by the borrower in an appropriate manner.</li> </ul>	<p>The Framework states that the net proceeds of SFI will be transferred to a dedicated sustainable finance internal account and tracked through RATCH’s established internal tracking system. The Sustainable Finance Working Group is responsible for monitoring, establishing, and accounting for the allocation of proceeds to eligible green and/or social projects.</p> <p>DNV confirms that the Framework outlines processes to track proceeds and allocations to the nominated projects, that are aligned with the Principles &amp; Standards.</p>
3b	Tracking Procedure	<p>So long as the Sustainable Bonds or Loans are outstanding, the balance of the tracked proceeds should be periodically reduced by amounts matching eligible green investments or loan disbursements made during that period.</p>	<p>The Framework states that the balance of net proceeds tracked within RATCH’s dedicated sustainable finance internal account will be periodically adjusted to reflect allocations made to eligible green and/or social projects throughout the life of the SFI.</p>

			<p>The Framework further specifies that RATCH aims to fully allocate the proceeds within 36 months from the issuance of each SFI. As project-level disbursements occur, the amount of net proceeds designated as unallocated will be reduced accordingly, ensuring clear and transparent tracking of how proceeds transition from unallocated to allocated status over time.</p> <p>DNV confirms that the Framework outlines processes to track proceeds and allocations to the nominated projects that are aligned with the Principles &amp; Standards.</p>
3c	Temporary Holdings	<p>Pending such investments or disbursements to eligible Sustainable Projects, the Issuer should make known to investors the intended types of temporary investment instruments for the balance of unallocated proceeds.</p>	<p>The Framework states that any unallocated funds will be managed in accordance with RATCH’s policies and invested in temporary liquid instruments, such as cash and other short-term liquid investments, until such time as they can be allocated to eligible green and/or social projects. The Framework further confirms that interest or investment income from these temporary holdings may be applied to defray costs associated with eligible projects or administrative expenses related to the SFI.</p> <p>DNV confirms that the Framework outlines instruments to which unallocated proceeds will be invested, that are aligned with the Principles &amp; Standards.</p>

#### 4. Reporting

Ref.	Criteria	Requirements	DNV Findings
4a	Periodical Reporting	<ul style="list-style-type: none"> <li>• Issuers should make, and keep, readily available up to date information on the use of proceeds to be renewed annually until full allocation, and on a timely basis in case of material developments.</li> <li>• The annual report should include a list of the projects to which Sustainable Bond proceeds have been allocated, as well as a brief description of the projects, the amounts allocated, and their expected impact.</li> <li>• Where confidentiality agreements, competitive considerations, or a large number of underlying projects limit the amount of detail that can be made available, the GBP recommend that information is presented in generic terms or on an aggregated portfolio basis (e.g.</li> </ul>	<p>The Framework states that RATCH will disclose, on an annual basis, the allocation of an amount equal to the net proceeds of SFI until full allocation and will also provide updates in the event of material changes. The annual allocation report will include the percentage of net proceeds allocated to eligible green and/or social projects, the share of financing versus refinancing, descriptions of financed projects including their locations, and the balance of unallocated proceeds.</p> <p>In addition, the Framework commits to publishing an annual impact report for as long as the SFI remain outstanding, presenting relevant environmental and social impact indicators, such as renewable energy generation, GHG emissions reduced or avoided, energy savings, clean transportation metrics,</p>

		<p>percentage allocated to certain project categories).</p>	<p>and social benefit metrics, along with methodologies and assumptions used. Where confidentiality applies, the Framework allows for aggregated or generic disclosure.</p> <p>DNV confirms that the Framework outlines reporting processes that are aligned with the Principles &amp; Standards.</p>
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### **About DNV**

Driven by our purpose of safeguarding life, property and the environment, DNV enables organisations to advance the safety and sustainability of their business. Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. With our origins stretching back to 1864, our reach today is global. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping customers make the world safer, smarter and greener group. All rights reserved.