



MOVING
FROM AMBITION TO ACTION

Vision

To become a **leading value-oriented energy and infrastructure company** in Asia Pacific.

Mission

M1
To ensure shareholders' value creation through financial return sustainably generated by accountability for environment, society and good governance.

M2
To achieve operational excellence and enhance competitiveness.

M3
To adhere fair business conduct and strict compliance to relevant laws and regulations.

M4
To raise employees' awareness and motivation of self-development for readiness in competition and business changing.

M5
To support security of national power grid and infrastructure system.

M6
To explore potential opportunities and new alternatives in energy-related and other non-power businesses to generate growth and business expansion for shareholders.

Corporate Value



POWER OF PROFESSIONAL
Be Entrepreneurial & Commit to Integrity.

POWER OF INNOVATION
Boost Agility & Encourage Innovation.

POWER OF TEAMWORK
Excel Synergy, Collaboration & Strengthen Partnership.

Business Strategy

STRENGTH
Efficient operations geared towards worthwhile revenue and returns and strong foundation for excellence.

SYNERGY
Integrated operations with extended collaboration with leading partners in Thailand and abroad, for sustainable growth opportunities in the Power Business and Non-Power Business in the value chain as well as value-added innovations

SUSTAINABILITY
Promoting renewable energy with concerns about environmental and social stewardship and governance for sustainable growth.

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CORPORATE SUSTAINABILITY POLICY



The company commits to operating business in principle of good corporate governance aiming for corporate sustainability which will bring shared value on economic, social and environment to its business value chain. Chief Executive Officer therefore formulates the Corporate Sustainable Development Policy as a guideline for its business operation in Thailand and abroad:



[More Details](#)

CORPORATE SUSTAINABILITY POLICY

Philosophy

1 Impose the corporate sustainable development strategy covering good governance, enterprise and project risk management, and emerging risks.

2 Assess risk and set measures to cope the risk impacts that may affect the company's sustainability in economic, social, environmental and governance aspects. This should be considered as materials for business planning, decision and operation for the organizational.



Economic

1. Adhere to merit and transparency in running business as well as compliance with the law, regulations, requirements, methods and standards specified by the regulatory agencies and accepted internationally.
2. Uphold and comply with guidelines and methods specified in the company's Code of Conduct as well as related effective policies, regulations, and announcements
3. Seek guidelines to develop and continuously improve efficiency for all business activities by defining the goal, evaluation methods, monitoring and sustainability assessment of the activity.
4. Develop and promote the corporate innovations and technology as a business strategy to create value added and long-term growth of the corporate as well as co - benefits for society and environment.
5. Promote and support all business partners, suppliers and stakeholders along the supply chain to run business based on the sustainable development practices.
6. Raise and instill awareness of social and environmental responsibility among executives and employees. by communicating thoroughly and provide training to educate about morality, ethics, honesty good corporate governance principles and environmental and social aspects that are significant to the sustainability of the organization annually.

1. Encourage and embed culture on safety, environmental protection and social responsibility on continual and consistent basis.
2. Develop, improve and upgrade the company's safety measures and standard beyond regulatory requirement. Additionally, any activities without proper and adequate safety control measures, proper Personal Protection Equipment and safety training must be prohibited.
3. Invest in the personnel capability enhancement by providing the skill and knowledge development and relevant resources as well as safety in workplace to build 'creative thinking' atmosphere and fully optimize employees' potential and capacity.
4. Respond to customers' needs and gain their satisfaction in products and services quantity and quality aligned with contractual agreement.
5. Encourage and promote participation of the community and stakeholders by opening for listening their advices, constructive and transparent dialogue, fair treatment, respect of diversity, supporting their quality living and community empowerment.
6. Collaborate with public sector, industrial associations, business partners, civil society and other stakeholders in developing and/ or applying sustainability standard and practices generally accepted by industry and/or relevant sectors.



Social



Environment

1. Manage the environmental quality and biodiversity according to the legal requirements and specified regulations as well as investing, developing and improving the environment management system, new applicable methodology ensuring higher efficiency of environment quality management and control.
2. Create and seek approaches and methods of reduction of resources, energy, emission, waste and greenhouse gas in order to protect, control and minimize impacts to environment, community and society.
3. Define target of emitted greenhouse gas from generating electricity and operating business, assessment methodology of climate change risks and impacts that may affect the generation and business, and search for measures of greenhouse gas emission reduction and climate change adaptation to ensure business growth and sustainability.

1. Treat all employees and workers in a fair and equal manner, without discrimination. The work assignment must be properly given to all employees based on their ability and appropriate compensation. The employment is prohibited labor aged below 18 years and illegal labor. This principle is also enforced among employees and workers of suppliers and/or stakeholders.
2. Take care and protect safety of employees, workers and company's asset by taking into account the others' rights and safety, with concern over personal right, confidentiality and information disclosure.
3. Respect right of employees and workers, and treat them with equality and human dignity manner.



Human Rights

Compliance

The company's directors, executives, employees and workers at all levels are responsible to support, promote and conform with the Corporate Sustainable Development Policy to be working culture concerning balance of economic, social and environmental benefits.

Message from Chairman and Chief Executive Officer



Dear all shareholders and stakeholders,

RATCH Group Public Company Limited remains committed and gives importance to sustainability. In the past year, the company formulated the Sustainability Strategy to strengthen climate change responses, respect for human rights, community engagement building, customer and supply chain relationship management. Our goals are to meet international standards, address stakeholders' expectations and enable vigorous adaptation to the transition to the low-carbon economy.

Exploring the right emission reduction solutions

RATCH is well aware that climate change is a crucial issue in the power and energy industry. The Climate Change Strategy was thus outlined, to consider feasible approaches for greenhouse gas emission reduction enabling to achieve carbon neutrality in 2050.

Under the strategy, the first approach to be adopted is the expansion of renewable energy capacity to 4,000 MW in 2035. In 2022, new investment projects raised the renewable energy capacity by 1,913 MW. The volume of generated and distributed renewable electricity was boosted to 3,480,497 megawatt-hour which increased by 15% from 2021 and accounted for 12% of total net distributed generation.

Energy efficiency in the production process is another approach that wins our focus and continually have implemented. The power plants invested by the company are required to strictly keep maintenance schedules and scramble for ways to reduce and save energy, to further cut greenhouse gas emissions. They were also encouraged to assess their carbon footprints and develop GHG inventory, in preparation for the emission management and reduction planning in line with the company's aspiration towards carbon neutrality by 2050. RATCH's Head Office, Ratchaburi Power Plant, RATCH Cogeneration Power Plant and



Nava Nakorn Power Plant have already conducted the carbon footprint calculation and were certified by the Thailand Greenhouse Gas Management (Public Organization). All the four assets have prepared the energy efficiency enhancement and energy-conservation plans and targets. RATCH will push all other power plants controlled by the company and joint ventures for carbon footprint calculation and carbon emission target setting. In this regard, Berkprai Cogeneration Power Plant will kick off this mission in 2023.

Investing in innovations that tackle climate change impacts is another effort to respond our carbon neutrality goal. This will be executed by Innopower Co., Ltd., in which RATCH holds a 30% stake. In 2022, Innopower made investments into startups involved with energy efficiency solutions and a fund investing in startups with innovations that support net zero greenhouse gas emissions. It also invested in businesses in the electric vehicle value chain like battery storage and EV charging station as well as a carbon credit trading business.

RATCH has also embarked on the afforestation, forest rehabilitation and conservation projects, to maintain and create natural carbon capture storage, planning to develop carbon offsetting schemes based on the projects' carbon credits. The projects, covering 1,613 rai, in collaboration with the Department of Royal Forest, the Department of Marine and Coastal Resources and Mae Fah Luang Foundation under the royal patronage are underway for carbon credits assessment. RATCH plans to expand the projects' forest area by another 10,000 rai.

Adopting TCFD framework for climate-related risk management

In 2022, RATCH adopted Task Force on Climate-Related Financial Disclosures' guidelines on climate-related risk assessment, to assess the impacts from physical risks and transition risks on all controlled power plants located in Thailand, Australia, Indonesia and Vietnam.

RATCH based the assessment on 2 Representative Concentration Pathways (RCPs): RCP 2.6 and RCP 8.5, the greenhouse gas concentration trajectories adopted by the Intergovernmental Panel on Climate Change. The analysis showed drought and flood as the physical risks of the power plants while transition risks concerned carbon taxes that tend to be enforced in the next 3-5 years to control or limit emissions. RATCH has outlined some plans to mitigate and prevent those risks and details are included in this report.

Standing for human rights

In 2022, RATCH proclaimed the Human Rights Policy, developed in line with the United Nations Guiding Principles on Business and Human Rights (UNGPs). The policy encompasses the human rights enshrined in international human rights principles and crucial to the company's operations. It is the framework for the human rights management at RATCH and all controlled entities and involves all activities that concern employees or workers in the supply chain, community and society. Our intention is to encourage joint ventures, business partners, suppliers and other relevant parties in the supply chain of RATCH and controlled entities, in Thailand and abroad, to operate with concerns about the human rights principles.

Aside, RATCH initiated the internal Human Rights Due Diligence, to assess and identify human rights risks. The process has fully covered RATCH, controlled entities, joint ventures and suppliers and the preventive and mitigating measures for each risk have been defined. RATCH also monitored possible violation of human rights and found no violation in 2022. In 2023, the company plans to review the Human Rights Policy ensuring its consistency with international principles, issues material to the current business context, as well as the human rights's risk registry.

Upholding governance for transparency

RATCH maintains its commitment towards morals, ethics, fairness and transparency, embracing all as the foundation of routine management and business operations. The Board of Directors has set important guidelines in the Code of Conduct which has been properly followed by the Company Group's executives and employees. Governance best practices have also been adopted to ensure sustainable values to the organization and confidence among shareholders and stakeholders. RATCH also vows to fight all forms of fraud and corruption. The membership to the Thai Private Sector Collective Action Against Corruption (CAC) was certified for the second time, for the 2022-2025 period. Importantly, in 2022, RATCH participated in the Corporate Governance Report of Thai Listed Companies 2022 of Thai Institutes of Directors and has impressively maintained the "Excellent" level of recognition (5 stars) for 15 consecutive years.

On behalf of the Board of Directors, we would like to express appreciation to the Management, employees, shareholders and stakeholders for consistent cooperation and supports that continually foster business growth and enable us to overcome challenges. We are now a company that is strong and ably generate economic values for shareholders and stakeholders as well as benefits to society and the environment throughout the past 23 years. Looking forward, RATCH will drive sustainability strategies and move towards the goal to become a leading value-oriented energy and infrastructure company in Asia Pacific that creates values in all economic, social and environmental dimensions.



Sincerely yours,

A stylized blue ink signature of Mr. Boonyanit Wongrukmit.

(Mr. Boonyanit Wongrukmit)

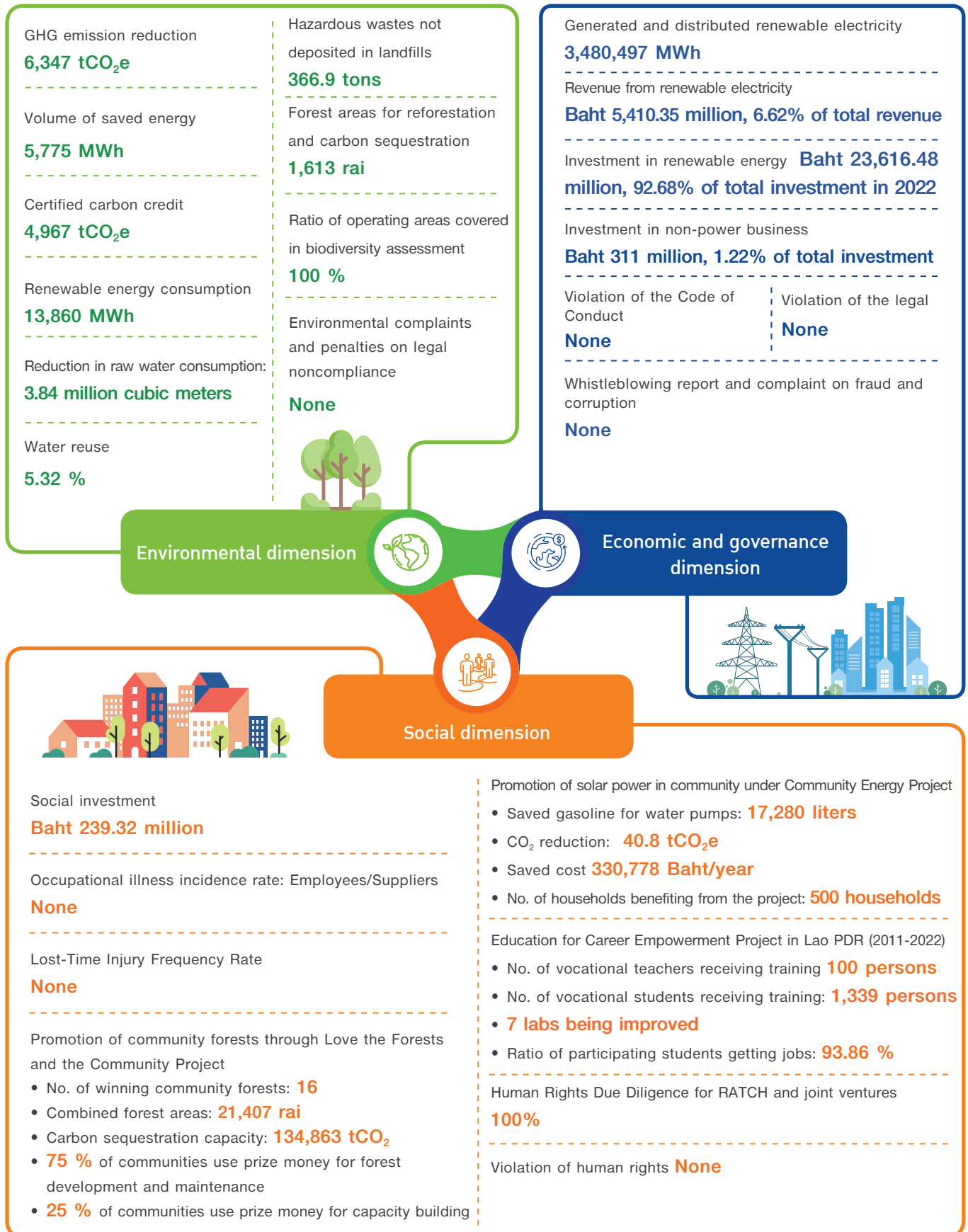
Chairman

A stylized blue ink signature of Miss Chosri Kietkajornkul.

(Miss Chosri Kietkajornkul)

Chief Executive Officer

Sustainability Performance Highlights 2022



Awards and Achievements in 2022



Awards and Recognition from External Organizations



RATCH Group Public Company Limited



2nd membership recertification
by Thai Private Sector Collective
Action Against Corruption



Excellence Performance of
Corporate Governance Report
of Thai Listed Companies 2022
Project by Thai Institute of
Directors Association with
support from the Stock
Exchange of Thailand for
the 15th consecutive year



Medal to benefactor
in Community Forest
Promotion and Development
2022 by the Royal Forest
Department



ASEAN Asset Class PLCs Award
from the 2021 ASEAN Corporate
Governance Scorecard (ACGS)
by and Thai Institute of
Directors with support from
ASEAN Capital Markets Forum
(ACMF) and Asian Development
Bank (ADB)



Royal Forest Department's
plaque for a contributor
in forest resource rehabilitation
and development category
in 2022



Inclusion in the Stock
Exchange of Thailand's
Thailand Sustainability
Investment (THSI) 2022 for
the 8th consecutive year



Honorary Sustainability
Disclosure Award 2022 by
Thaipat Institute

Full score in the Annual
General Meeting Quality
Assessment 2022 by Thai
Investors Association for
the 4th consecutive year



Ratchaburi Electricity Generating Company Limited



Honorary CSR-DIW Continuous Award 2022 for operator's social responsibility standard from the Department of Industrial Works, Ministry of Industry for the 11th consecutive year



Thailand Labour Excellence Award 2022 (Ratchaburi Province) for drug prevention and rehabilitation



Cultural Contributor Award 2022 from the Ministry of Culture, in recognition of corporate contribution to the national cultural heritage conservation and outstanding role in promoting religious, arts and cultural affairs



Sustainability Disclosure Acknowledgement Certificate by Thaipat Institute, for sustainability disclosure



Sahacogen (Chonburi) Public Company Limited

- 2nd membership recertification by Thai Private Sector Collective Action Against Corruption
- Excellent performance in Corporate Governance Report of Thai Listed Companies 2022 Project
- Inclusion in the Thailand Sustainability Investment (THSI) 2022

- Investors' Choice Award 2022, for the 13th consecutive year
- Honorary Sustainability Disclosure Acknowledgement Award (Sustainability Disclosure Community) by Thaipat Institute
- Full score in the Annual General Meeting Quality Assessment 2022 by Thai Investors Association



Berkprai Cogeneration Co., Ltd.

Good Environmental Governance Standard Award 2022 by Ministry of Industry



Nava Nakorn Electricity Generating Co., Ltd.

- Good Environmental Governance Standard Award 2022 by Ministry of Industry
- Award under the Zero Accident Campaign 2022 by Thailand Institute of Occupational Safety And Health (Public Organization) for the 2nd year



RATCH-Cogeneration Co., Ltd.

Good Environmental Governance Standard Award 2022 by Ministry of Industry



Sahacogen Green Co., Ltd.

Award for occupational safety, health and environmental standard by Thailand Institute of Occupational Safety And Health (Public Organization)



Sahagreen Forest Co., Ltd.

Recognition for drug prevention and rehabilitation scheme

Certificates

Certified standard	Certified entity
Carbon Footprint for Organization by Thailand Greenhouse Gas Management Organization (Public Organization)	<ul style="list-style-type: none"> • RATCH Group Public Company Limited • Ratchaburi Electricity Generating Company Limited • RATCH-Cogeneration Company Limited • Nava Nakorn Electricity Generating Company Limited
Thailand Voluntary Emission Reduction Program Energy efficiency category by Thailand Greenhouse Gas Management Organization (Public Organization)	Energy Efficiency Project through LED Lighting Replacement by Ratchaburi Electricity Generating Company Limited <ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited (Project owner/developer) • RATCH Group Public Company Limited (Co-developer)
Thailand Voluntary Emission Reduction Program Renewable energy category by Thailand Greenhouse Gas Management Organization (Public Organization)	Solar Floating Project at Ratchaburi Electricity Generating Company Limited <ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited (Project owner/developer) • RATCH Group Public Company Limited (Co-developer)
Thailand Voluntary Emission Reduction Program Forestation and Green area category by Thailand Greenhouse Gas Management Organization (Public Organization)	Sustainable Forestation Project of Ratchaburi Power Plant by Ratchaburi Electricity Generating Company Limited <ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited (Project owner/developer) • RATCH Group Public Company Limited (Co-developer)
Quality Management System under ISO 9001:2015 standard	<ul style="list-style-type: none"> • Nava Nakorn Electricity Generating Company Limited • RATCH-Cogeneration Company Limited • Berkprai Cogeneration Company Limited • Sahacogen (Chonburi) Public Company Limited
Environmental Management System under ISO 14001:2015 standard	<ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited • Nava Nakorn Electricity Generating Company Limited • Sahacogen (Chonburi) Public Company Limited
Occupational Health and Safety Management System under ISO 45001:2018 standard	<ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited • Sahacogen (Chonburi) Public Company Limited
Green Industry Award - Level 3 (Green System) by the Department of Industrial Works, Ministry of Industry	<ul style="list-style-type: none"> • Ratchaburi Electricity Generating Company Limited • Sahacogen (Chonburi) Public Company Limited
Green Industry Award - Level 2 (Green System) by the Department of Industrial Works, Ministry of Industry	<ul style="list-style-type: none"> • Berkprai Cogeneration Company Limited

Sustainability Development Goals Mapping

RATCH has based its operations on sustainable development principles, to achieve the organization's economic, social and environmental goals and also help support the Sustainable Development Goals (SDGs).

In 2022, RATCH's operations promoted and supported 8 Goals in alignment with business context, the value chain of each business and the ambition to venture into SDG-supporting businesses.



Goal

Goal 3 Ensure healthy lives and promote well-being for all at all ages



Target 3.8: Achieve necessary and quality health service and access to safe, effective, quality and affordable essential medicines and vaccines.

Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



Target 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all



Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all



Target 8.7: Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor, including recruitment and use of child soldiers, and by 2025 end child labor in all its forms.

Target 8.8: Protect labor rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment.

Goal 12 Ensure sustainable consumption and production patterns



Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse.

Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Goal 13 Take urgent action to combat climate change and its impacts



Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development



Target 14.2: By 2020, sustainably manage, and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience and taking action for their restoration, to achieve healthy and productive oceans.

Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.



Implementation

- Partnership with Principal Healthcare Co., Ltd. in the establishment of a 59-bed tertiary private hospital in Sakhon Nakhon Province, to broaden the access to health services, medicines and vaccines for local residents and people from neighboring provinces.
- Ratchaburi Power Plant's mobile medical and dental activity, to provide basic health service to the residents of 9 sub-districts in Damnoen Saduak and Photharam districts, Ratchaburi Province.

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Education for Career Empowerment Project implemented jointly by RATCH and Lao PDR's Ministry of Education and Sports, to equip vocational teachers and students in Lao PDR with technical knowledge and skills for decent jobs and entrepreneurship.

.....

RATCH's generation of electricity from renewable energy - wind, solar and hydro power as well as biomass, with equity installed capacity of 1,913 MW under the target to raise renewable energy electricity generation capacity to 4,000 MW in 2035.

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RATCH promotes the operations with respect for human rights by protecting and respecting labor rights; ensuring safe and stable work environment for all employees; thoroughly reviewing the issues concerning human rights, treatment of labor and occupational health and safety.

Aside, RATCH announced the policies and guidelines on occupational health and safety for its operations and suppliers'; and assessment of work-related risks and control measures for the employees of RATCH, suppliers and sub-contractors. To raise awareness on safety and occupational health, targeting all job operators, activities have been organized including Hearing Preservation, Safety Day at power plants, Stop Work and Log Out - Tag Out (LOTO).

.....

RATCH emphasizes efficient and sustainable resource management and utilization for minimum production waste and sustainable production. The aspiration is enshrined in the policies concerning society, the environment and Sustainable Development Policy, which is communicated with all entities in the Group for sustainability throughout the value chain.

Aside, sustainability operations and performance are integrated in the annual Sustainability Report in alignment with the GRI reporting standards.

.....

RATCH prepared the Climate Change Strategy, targets and the Decarbonization Roadmap aiming to achieve carbon neutrality and assessed related risks under TCFD disclosure recommendations.

RATCH also raised awareness and mobilized community engagement in climate impact mitigation through Love the Forest and the Community Project and Community Energy Project. Under these first project, community is encouraged and supported to help manage and restore forests as carbon sinks and a sustainable food source. The latter project aims to promote awareness in energy optimization, energy saving and development of energy innovations from local resources.

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RATCH has supported the reforestation and rehabilitation of mangroves encompassing 113.47 rai, in collaboration with the Department of Marine and Coastal Resources. The project will become a Thailand Voluntary Emission Reduction Program (T-VER) scheme, for subsequent carbon credit certification.

.....

RATCH has preserved the original environment of power plants' surrounding areas, to maintain the habitats and livelihood of wildlife and local animals. A terrestrial reforestation project of 500 rai to create green area is organized in collaboration with the Royal Forest Department, while engaging with community to protect, maintain and rehabilitate community forests for ecosystem biodiversity and food sources.

Topic in this report

- RATCH Business Profile
- Respect for Human Rights
- Community and Social Stewardship

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- Community and Social Stewardship

-
- RATCH Business Profile
 - Economic Performance

-
- Respect for Human Rights
 - Employee Stewardship
 - Safety and Occupational Health

-
- Environmental Impact Management
 - Responses to Climate Change
 - Performance Data

-
- Responses to Climate Change
 - Protection and Conservation of Biodiversity
 - Community and Social Stewardship

-
- Responses to Climate Change

-
- Protection and Conservation of Biodiversity
 - Community and Social Stewardship



About this Report

This report was developed to reveal RATCH Group Public Company Limited's sustainability operating performance in 2022 in the governance, economic, social and environmental aspects. The operations mainly concerned the power business, the company's primary business that can cause impacts on stakeholders. Topics material to RATCH, stakeholders and the company's business were transparently disclosed to inform shareholders and stakeholders and raise their confidence in the path towards sustainability.

Reporting approach

This report was prepared in accordance with Global Reporting Initiative, (GRI) Standards 2021 and supplement for the Electric Utilities Sector. The information contained in this report concerned the operations from 1 January 2022 to 31 December 2022.

Scope of the report

The information contained in this report concerned RATCH Group Public Company Limited, its subsidiaries and joint ventures in which the company has operational control, located in Thailand, Australia, Lao PDR and Singapore. More details of all subsidiaries and joint ventures appeared in Form 56-1 One Report and the company website: www.ratch.co.th.

Thailand	Location	Material issues										
		Economic	Environmental						Social/Human rights			
		Production	Air	Water	Waste	Biodiversity	Energy consumption	GHG	Safety	Employee	Community	Human rights
1. RATCH Group Public Co., Ltd.	Thailand	-	-	-	-	-	✓	✓	✓	✓	✓	✓
Power Business												
2. Ratchaburi Electricity Generating Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Nava Nakorn Electricity Generation Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Berkprai Cogeneration Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. RATCH Cogeneration Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Sahacogen (Chonburi) Public Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
7. Nexif RATCH Energy Rayong Co., Ltd.	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8. RATCH-Australia Corporation Pty Ltd	Australia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Fareast Renewable Development Pte. Ltd.	Singapore	✓	-	✓	✓	✓	-	-	✓	-	-	✓
Non-power Business												
10. RATCH-LAO Services Co., Ltd.	Lao PDR	✓	-	-	-	-	-	-	✓	✓	✓	✓
11. Asia Water Co., Ltd.	Lao PDR	✓	-	✓	-	-	-	-	-	-	-	✓

Reporting Reliability

This Sustainability Report will be disclosed to shareholders, stakeholders and the general public. The report followed the procedure in accordance with GRI Standards with the endorsement from top executives and the Board of Directors. Its conformity with GRI Standards was verified by an external, independent and unrelated assurance agency. The Assurance Statement appeared on page 269.

The assurance agency met the supplier qualification criteria on governance, environmental and social aspects and was transparently and fairly selected under the company's procurement procedure.



Report Assurance


The assurance to this Sustainability Report concerned 2 parts: 1) economic information based on the accounting information disclosed in Form 56-1 One Report which was audited and verified by a certified auditor and 2) environmental and social information disclosed in line with GRI Standards 2021 was audited and verified by an external assurance agency. RATCH also sought assurance for 4 additional environmental and social indicators that were significant to the company and stakeholders, on top of the indicators applied in 2021. The number of verified indicators thus totaled 20 in 2022.

Indicators	GRI Standards	Topic Standards
1. Materials used (by weight or volume)	GRI 301: Materials 2016	GRI 301-1: Materials used by weight or volume
2. Internal energy consumption	GRI 302: Energy 2016	GRI 302-1: Energy consumption within the organization
3. Energy Intensity		GRI 302-3: Energy intensity
4. Reduced energy volume		GRI 302-4: Reduction of energy consumption

Indicators	GRI Standards	Topic Standards
5. Water withdrawal	GRI 303: Water and Effluents 2018	GRI 303-3: Water withdrawal
6. Water discharge		GRI 303-4: Water discharge
7. Water consumption		GRI 303-5: Water consumption
8. Direct GHG emissions	GRI 305: Emissions 2016	GRI 305-1: Direct (Scope 1) GHG emissions
9. Energy indirect GHG emissions		GRI 305-2: Energy indirect (Scope 2) GHG emissions
10. Other indirect GHG emissions		GRI 305-3 Other indirect (Scope 3) GHG emissions
11. GHG Emissions Intensity		GRI 305-4: GHG emissions intensity
12. Reduced GHG emissions volume		GRI 305-5: Reduction of GHG emissions
13. NO _x , SO _x , and other significant air emissions		GRI 305-7: Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions
14. Waste generated		GRI 306: Waste 2020
15. Waste recovered	GRI 306-4: Waste diverted from disposal	
16. Waste disposed	GRI 306-5: Waste directed to disposal	
17. New employee hires and employee turnover	GRI 401: Employment 2016	GRI 401-1: New employee hires and employee turnover
18. Work-related injury	GRI 403: Occupational Health and Safety 2018	GRI 403-9: Work-related injuries
19. Work-related illness		GRI 403-10: Work-related ill health
20. Operation with local community engagement, impact assessment, and development programs	GRI 413: Local Communities 2016	GRI 413-1: Operation with local community engagement, impact assessment, and development programs

Channels for information inquiry and recommendations

Report responsible unit: Corporate Affairs Department

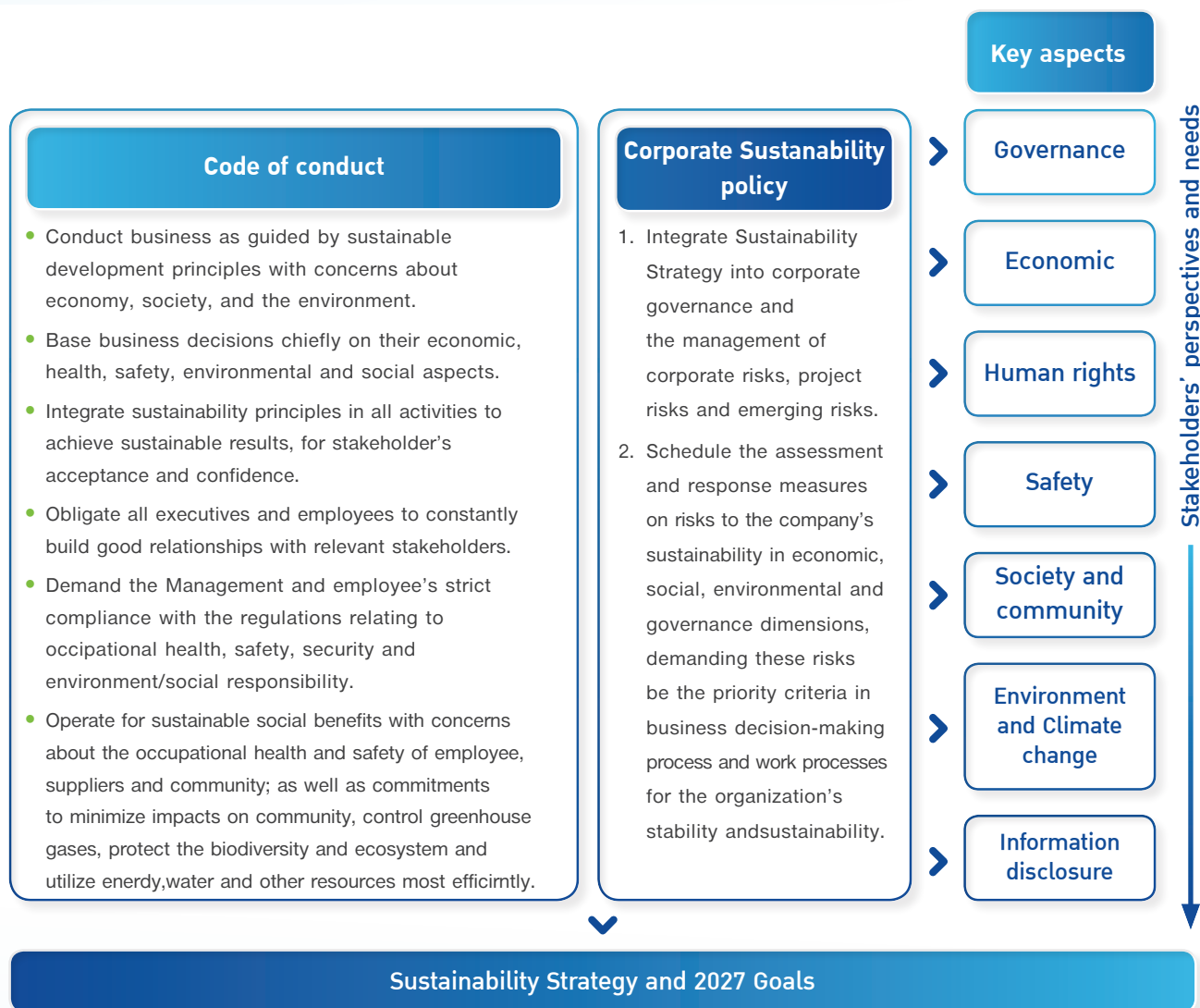
 Tel : 0 2794 9940, 0 2794 9951

 Email : charusudab@ratch.co.th, pornpent@ratch.co.th

Sustainability Strategy and Implementation Progress



RATCH deployed sustainability principles concerning key 7 aspects of economic, social, environment and governance dimensions as specified in the company's code of conduct and the Corporate Sustainability Policy in doing business. In 2022, the company processed information and feedback given by relevant stakeholders to push forward key strategies to achieve long-term goals that will concurrently satisfy stakeholders and support the operations.



Formulation of Sustainability Strategy

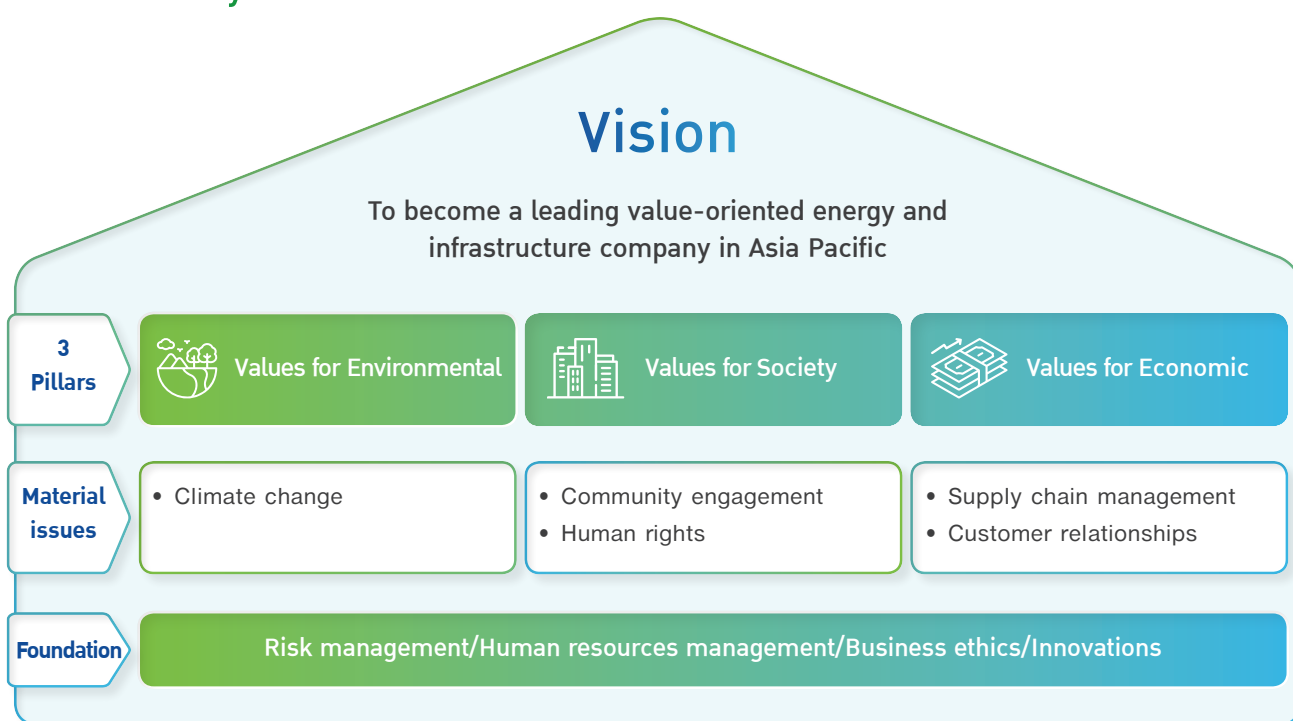
The Board of Directors in 2022 endorsed the Sustainability Strategy and its goals in economic, environmental and social dimensions. The strategy shaped the corporate direction on sustainability management that encompasses 3 sustainability pillars (inclusive of governance). The strategy is aimed at satisfying stakeholders' expectations that RATCH shall seek a sustainable path in doing business, through the setting of operational framework and business best practices as guided by sustainable development principles and the emphasis on ESG risks. Stakeholders nowadays give importance to sustainability operations and use it as a benchmark to evaluate the organization's long-term efficiency and effectiveness.

RATCH's Sustainability Strategy was prepared with an international-standard process. It started with the gathering and analysis of secondary data of issues material to stakeholders and the global community and how to weigh the data and give it scores. The process encompassed interviews of stakeholders' representatives and brainstorming to prioritize the issues and pinpoint key strategies. It was completed with assistance from an external specialized and experienced consulting firm, for stakeholders' confidence and acceptance as well as actual implementation and concrete results.

The Sustainability Strategy including 3 pillars – the environment, society and economy (inclusive of governance). It contains 5 topics material to the corporate sustainability and stakeholders in the value chain which are climate change, community engagement, human rights, supply chain management and customer relationships. Goals are set for each material issue, along with a roadmap and targets, in alignment with the company's strategic plans and goals.

On climate change which is a significant issue to all players in the energy industry including RATCH and its stakeholders, the company prepared the separate Climate Strategy as the framework for greenhouse gas management with the goal to achieve Carbon Neutrality target by 2050 in line with Thailand's goal.




Sustainability Framework





Sustainability Strategy's components

- **Section 1:** 3 pillars covering environmental, social and economic dimensions
- **Section 2:** material topics under each dimension. There are 5 topics altogether: climate change (environmental aspect), community engagement (social aspect), human rights (social aspect), supply chain management (economic aspect) and customer relationships (economic aspect).
- **Section 3:** issues essential for the organizational strength (Foundation)

Goals for material topics of Sustainability Strategy

Material topic	Principal goals	Concept	2023 work plan
 <p>Response to Climate Change</p>	<p>Carbon Neutrality by 2050</p> <p>Targets</p> <ul style="list-style-type: none"> By 2030, reduce carbon intensity by 15% By 2025, raise renewable capacity by 25% By 2026, take Carbon Neutrality into consideration 	<ul style="list-style-type: none"> Determination to manage/ reduce greenhouse gases which will reduce pressure on business operations as RATCH is in the industry that is a primary source of greenhouse gas emissions. Determination to reduce carbon emissions will offer new business and fund-raising opportunities. 	<ul style="list-style-type: none"> Study the feasibility and suitability of emission reduction, for the preparation of Decarbonization Roadmap
 <p>Community Engagement</p>	<p>Improvement of the company Group's social activities that contribute positive impacts in the national level and support SDGs by 2030</p>	<ul style="list-style-type: none"> Projects with systematic assessment process in support of the United Nations Sustainable Development Goals Projects that assist and improve the quality of life for local community near operating sites 	<ul style="list-style-type: none"> Prepare the Company Group's social activity master plan around target SDGs and kick off the implementation
 <p>Human Rights</p>	<p>Zero human rights violation</p> <p>Targets</p> <ul style="list-style-type: none"> Complete assessment (100%) of human rights risks involving all company's equity-owned entities and suppliers in 2025 Human rights impact assessment covering all rights-holder groups in 2026 Complaint channel that accommodates all rights-holder groups established in 2026 and annual reporting to the Board of Directors 	<ul style="list-style-type: none"> To devise measures against basic rights violation in the workplace and in business activities that may cause negative impacts/significantly damage corporate reputation and credibility To monitor human rights issues material to the energy industry, domestically and internationally, from safety to labor aspects 	<ul style="list-style-type: none"> Review the Human Rights Risk Register developed in 2022 Assess human rights impacts on employees

Material topic	Principal goals	Concept	2023 work plan
 <p>Supply Chain Management</p>	<p>Complete ESG audit (100%) of critical suppliers and improvement evaluation</p>	<ul style="list-style-type: none"> Establishment of a risk monitoring and assessment system, to reduce risks and impacts on the company; as well as ESG targets for suppliers based on the assessment of their risks Enhancement of efficiency of procurement process and supplier risk assessment system employed by the Company and subsidiaries 	<ul style="list-style-type: none"> Impose Supplier Code of Conduct as part of procurement contracts, starting with high-risk suppliers Conduct risk assessment on high-risk and critical Develop a sustainable supply chain management system through ESG integration
 <p>Customer Relationships</p>	<p>90% satisfaction score from all customer groups in 2026</p> <p>Targets</p> <ul style="list-style-type: none"> In 2026, customer satisfaction score at 90% In 2026, all customer groups covered by survey (100%) 	<ul style="list-style-type: none"> Diversification not only strengthens business security but also expands the customer base to reach retail customers, which demands a process to satisfy the needs and expectations of various customer groups. Satisfying customers and maintaining customer satisfaction will enable the company to retain customers and their confidence. 	<ul style="list-style-type: none"> Kick off the development of a standard customer relationship assessment approach for the Company Group.



Progress on strategy implementation

In 2022, two key topics under the Sustainability Strategy were implemented and here are the progress:

1 Climate change (environmental dimension): The topic is significant to RATCH and stakeholders. RATCH thus developed a climate change strategy. Based on the study of feasible emission reduction approaches and methods, the Decarbonization Roadmap was mapped and outlined feasible targets in alignment with Thailand's goal, SDG 12: Responsible Consumption & Production, and SDG 13: Climate Action. (Details on the implementation of climate change mitigation actions appear in Page 91)

2 Human rights (social dimension): RATCH announced the Human Rights Policy that was aligned with the Universal Declaration of Human Rights (UDHR), the United Nations Guiding Principles on Business and Human Rights (UNGPs), the United Nations Global Compact (UNGC) and the ILO Declaration on Fundamental Principles and Rights at Work. The Human Rights Due Diligence (HRDD) was conducted on all business units, covering RATCH, businesses in which RATCH has operational controlling power and joint ventures, to develop the Human Rights Risk Register that enables efficient monitoring of each unit's risk management. (Details on the implementation of human rights actions appear in Page 141)

Progress of remediation of impacts from saddle dam D failure By Xe Pian-Xe Namnoy Power Company Limited

Following the saddle dam D washed out at Xe Pian-Xe Namnoy Hydroelectric Power Plant, developed and operated by Xe Pian-Xe Namnoy Power Company Limited (PNPC) which is jointly owned by RATCH Group PCL, SK Ecoplant Co., Ltd., Korea Western Power Co., Ltd. and Lao Holding State Enterprise (“LHSE”) at 25%, 26%, 25% and 24% respectively. PNPC has followed through the Lao government’s Master Plan concerning compensation, remediation and rehabilitation at its best and under close control and supervision of the government. PNPC has also informed its Board of Directors, represented by all 4 shareholders including RATCH, of the actions and sought the board’s consideration on significant matters on a regular basis.

Impact remediation

PNPC has paid compensation to the affected and remediated the impacts according to the Lao PDR’s law and criteria imposed in Memorandum of Agreement on Compensation (MOA) mutually endorsed by the Provincial Disaster Management Committee, Attapeu province, PNPC and the project’s EPC contractor (Engineering, Procurement and Construction). The compensation according to the MOA comprised of 2 key elements.

- 1) The compensation for the affected who was paid by PNPC as agreed with the Government of Lao in January 2020.
- 2) The compensation for the affected according to the Master Plan for Rehabilitation in Sanamxay District (Master Plan) encompassed construction of new villages, new permanent houses, provision of new agricultural lands, and environment and forest rehabilitation. The Master Plan’s compensation was made by PNPC since April 2021 and totally completed in July 2022, of which the Completion Compensation Payment certificate was issued to PNPC on 10 August 2022.

The compensation and remediation have constantly been paid by PNPC from January 2020 to January 2023 totalled value of USD 91.26 million.

PNPC and the Lao government have jointly assessed the impacts and compensation process. A dialogue was established to explain the details of impact assessment, damage calculation and compensation to all affected household one by one. Opinions were welcomed along with petitions in case of disagreements to the estimated compensation. In 2022, the compensation process was completed and all households agreed to the received compensation.

Compensation items	Scope	Completion date
1. Loss of life	The official number of dead and missing persons totaled 71.	June 2019
2. Children losing father and/or mother	28 children to receive compensation until they reach 18 years	June 2019
3. Severely-affected villages in Sanamxay District, Attapeu Province	7 villages	September 2020
4. Slightly-affected villages in Sanamxay District, Attapeu Province	13 villages	June 2020
5. Local business sector	35 businesses	January 2020
6. Infrastructure and utilities	<ul style="list-style-type: none"> • 3 telecom companies • 10 types of utility and infrastructure - road, bridge, irrigation system, school, public health center, temple, electricity, police station, village office and military office 	<ul style="list-style-type: none"> • April 2020 • September 2020
7. Environment	Agricultural, watershed and forest lands	<ul style="list-style-type: none"> • For agricultural and watershed lands, completed in September 2020 • For forest areas, completed in December 2020
8. Houses and toilets	802 households	January 2021
9. Vehicles and stupas	Damaged vehicles in 19 villages and the stupas of 2 temples	April 2021
10. Damaged agricultural area in Paksong District, Champassak Province	6 agricultural lands	January 2022
11. Villages and households in Paksong District, Champassak Province	2 villages and 6 households	January 2022

Livelihood rehabilitation and improvement

The Lao government outlined Master Plan for Rehabilitation in Sanamxay district: (the Master Plan) for livelihood rehabilitation and development of the affected worth USD 247 million. While PNP is responsible for the budget for implementation of the Master Plan, the Lao government supervises the implementation. The progress is summarized below:

Reconstruction of villages and agricultural lands for the severely-affected

According to the Master Plan, the Government of Lao has comprehensively determined new location suited for construction of 4 new permanent villages namely; Dongbakmai Hinkham, Donebokmai Sengchanh, Hinlath and Samongmai Pindong, and 812 new houses for villagers from 5 severely affected villages. PNP reached an agreement with Attapeu Province and the Lao government to spend USD 24.5 million on the construction of 700 new houses, while 46 and 66 new houses were supported by the Government of Thailand and United Nations Human Settlement Programme (UN-HABITAT) respectively.

The available 4 home designs was matched local culture and traditions as well as dwellers' way of life. They came with large space and a toilet, to improve the quality of life. Additionally, the Lao government prudently selected the sites for agricultural lands.

Another USD 22.8 million was allocated by PNPC for the construction of necessary infrastructure and utility services at the 4 new villages, covering the roads into the villages and village streets, electrical networks, kindergarten schools, primary schools, secondary schools, dormitories and canteens, village halls, temples, tap water networks, public health offices, physicians' accommodations, markets, government offices for resettlement coordination, etc.

The new house construction has been progressively proceeded, but interrupted by the outbreak of COVID-19, leading to domestic travel restriction imposed by the government. In 2021, 263 new houses were finished comprising of 151 houses supported by PNPC, 46 and 66 houses under supports of the Government of Thailand and UN-HABITAT orderly. In July 2022, the construction of remaining houses was completely done.

New villages	Area (hectare)	No. of households	Progress
Dongbakmai Hinkham	120	333	100% completed and resettled villagers have moved in.
Donebokmai Sengchanh	60	73	
Hinlath	70	194	
Samongmai Pindong	56	100	

Agricultural lands for resettled villagers

Village	Total agricultural lands (hectare)	Progress
Dongbakmai Hinkham	2,140	<ul style="list-style-type: none"> Explosive ordnance disposal survey and land clearing completed in 2020 Experimental rice growing initiated, to monitor growth and test soil condition Agricultural land use by the villagers already done
Donebokmai Sengchanh		
Hinlath		
Samongmai Pindong		

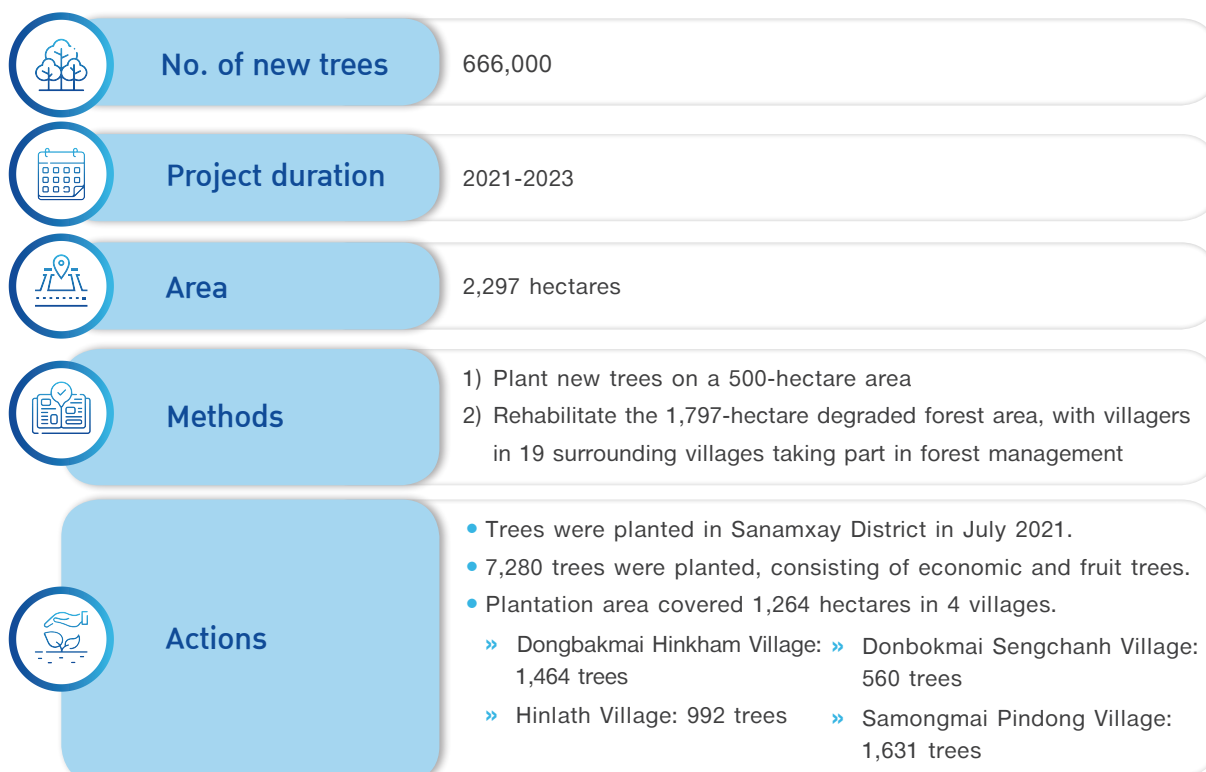
Rehabilitation of resettled villagers' livelihood and quality of life

Activity	Progress
Cleaning of 2 affected villages and houses	The affected were transferred back to their home in December 2018.
Mud clearing from agricultural lands	Completed
Construction of health center at Khoum BanThae	Completed
Aquaculture support for daily food, involving fish and frog farming	Completed
Construction of irrigation systems 1) Xe pian irrigation system 2) Huay Samong irrigation system Phase 1 3) Huay Samong irrigation system Phase 2	Completed
Construction of 11 bridges along 18A Road	Completed
Financial support for temporary accommodation, daily allowance and monthly rice supplies to the 4 villages' affected households	Completed
Construction of agricultural knowledge service center	Completed
Reparation and maintenance of irrigation systems	Completed
Construction of the Lao government's coordination center	Completed
Construction of central markets for agricultural goods in Dongbakmai Hinkham, Hinlath and Samongmai Pindong villages	Completed

Forest rehabilitation plan

The forest rehabilitation, was supervised and carried out by Attapeu Province's agricultural and forest office.

The progress is summarized below:



Material Topics in 2022



Materiality identification process

RATCH adopts the Global Reporting Initiative Standards 2021 (GRI Standards 2021) to identify material topics, taking into account the impacts from the company's operations on stakeholders in economic, governance, social and environmental dimensions. The identification process was completed in 4 steps as follows:

1. Operational due diligence

The central responsible unit for Sustainability Report conducted the due diligence on the company's operations. It entailed the company, all subsidiaries and all joint ventures in power and non-power businesses. Factors adopted in the identification of materiality or impacts from the company's operations concerned 4 aspects as follows:

1. Business operations

Information for consideration

- Vision, missions, strategies and targets
- Investment, operational and financial risks and opportunity
- Sustainability strategy and sustainability-related operations
- Power plants and investments in Thailand and abroad
- Power generation process and products/services from non-power business; product/service distribution; and customers
- Administration, work process, number of employees and job descriptions

2. Business relationship

Information for consideration

- Partners of co-investment projects/ entities in Thailand and abroad
- Suppliers in Thailand and abroad involved with the company's operations, from project development phase to construction and operation phases
- Majority-owned subsidiaries and joint ventures in which the company has operational control in power and non-power businesses in Thailand and abroad

3. Sustainability issues concerning the company's operations

Information for consideration

- Sustainability and ESG assessment by various organizations like the Stock Exchange of Thailand, S&P Global and CDP
- Information gathered from various channels like press conferences, analyst meeting, inquiries and interviews of investors, credit rating and ESG rating agencies, financial institutions and questionnaires of institutional investors/ mutual fund companies, etc.
- Power plant's Environment Impact Assessment Report (EIA) and EIA's compliance and monitoring reports
- Safety statistics of RATCH, subsidiaries and other operational controlled entities
- Employee engagement survey results, community satisfaction survey results and complaint reports
- ESG analysis or articles by international organizations and consulting agencies
- Government policies, plans and targets on ESG

4. Stakeholders

Information for consideration

- People in the value chain of power and non-power businesses
- People in the supply chains of RATCH and all operational controlled entities
- Employees and workers of RATCH, subsidiaries and joint ventures



2. Materiality identification

Based on the aforementioned information, the company gathered material issues in environmental, social, human rights and governance aspects to identify the impacts from the company's activities on stakeholders and the environment. Emphasis was placed on the actual and potential negative impacts of each issue and the company's connection to the negative impacts.

- (1) Cause of impacts
- (2) Contribution to impacts
- (3) Directly linked to the impacts

All gathered material issues then were identified the impacts from the operations of RATCH, all subsidiaries and joint ventures in Thailand, Lao PDR, Australia, Indonesia, Vietnam and Singapore.

RATCH also interviewed the representatives of key stakeholders which are the business partner, the supplier serving for power plant operation and maintenance, the electricity buyer, the community leaders, the community representatives, the Sub-district health officer, the monk, the local environmental regulatory bodies, the environmental academic and the institutional investors (ESG funds) for their opinions on the impacts from the Group's operations and impact severity, concerns and recommendations for correction or improvement. The interviews were used in the materiality assessment.

3. Materiality assessment

The identified impacts, per stakeholders' opinions, were assessed to pinpoint the severity. The assessment focused on:

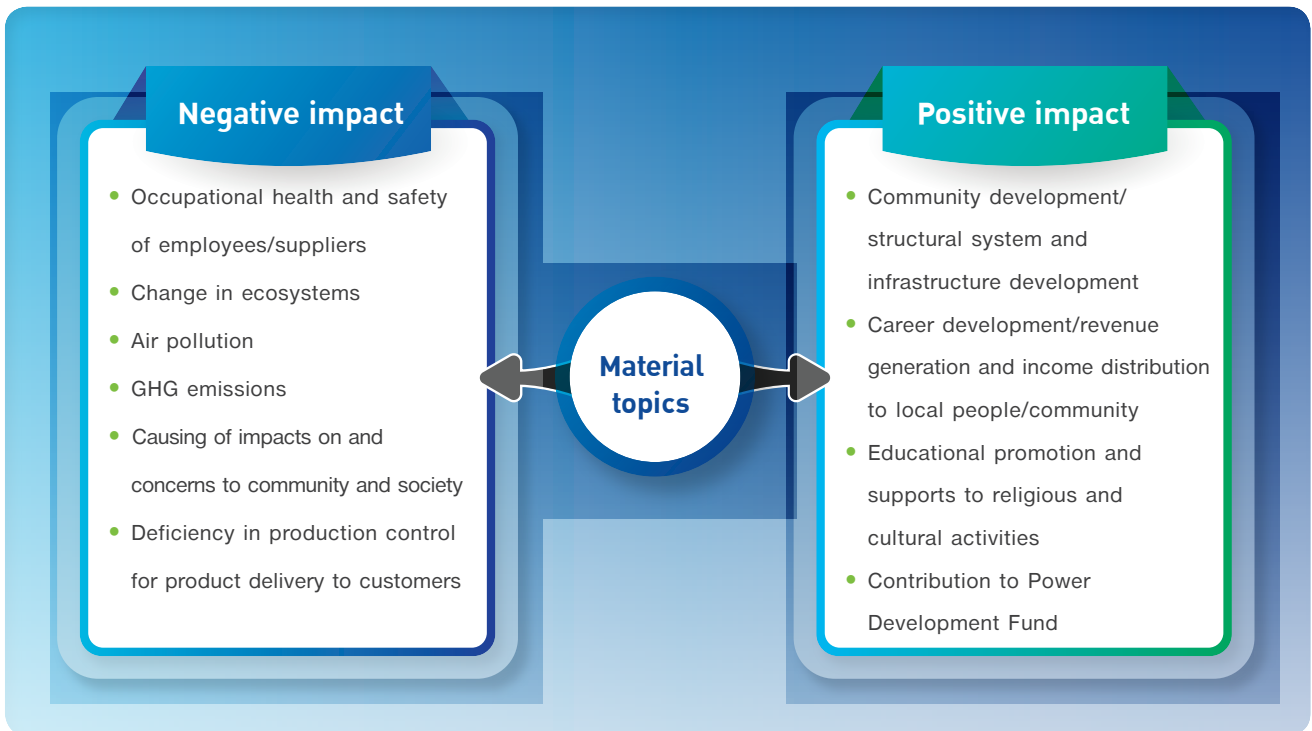
- 1) **Actual Impacts:** only impact severity is assessed.
- 2) **Potential Impacts:** impact severity and likelihood of impact are assessed.

Assessment criteria of severity and likelihood



The assessment form was filled up with the scale of severity which stakeholders assigned to each material issue, concerning the negative and positive sides of actual and potential impacts, to show the average severity level of each issue.

In case that the stakeholders did witness an impact, only severity was assessed and the base scale of severity level was adjusted to 100%, like in the case of potential impacts.



4. Materiality prioritization for reporting

The assessment results were put into 2 categories: issues that caused positive impacts and issues that caused negative impacts. The issues with negative impacts were prioritized as follows:

- (1) set the threshold of risk impacts based on the negative impact scores and group those with scores above the threshold as significant materiality
- (2) set material topics
- (3) prioritize the material topics
- (4) consider compatibility of the material topics against the GRI Standards topics and the Electric Utilities Sector supplement and
- (5) concluding the list of material topics for the preparation of 2022 Sustainability Report. The list was submitted to the Executive Vice President - Corporate Administration, as the person in charge of the reporting process, and subsequently to Chief Executive Officer for approval. Finally, the Sustainability Report was presented to the Board of Directors.

Material issue	GRI indicators	Topic in this report	Page	Reporting boundary		
				Internal		External
				Power business	Non-power business	Community/customer/supplier/partner/shareholder/creditors/regulator
1) Occupational health and safety for employees and suppliers	<ul style="list-style-type: none"> GRI 403: Occupational Health and Safety 2018 GRI 416-2 Incidents of non-compliance concerning the health and safety impacts of products and services 	<ul style="list-style-type: none"> Safety and occupational health Management of Key Material Aspects 	147-158 30-33	✓	✓	✓
2) Changes in ecosystems	<ul style="list-style-type: none"> GRI 304: Biodiversity 2016 	<ul style="list-style-type: none"> Biodiversity Conservation Management of Key Material Aspects 	135-140 30-33	✓	-	-
3) Air quality management	<ul style="list-style-type: none"> GRI 305-7 Nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions 	<ul style="list-style-type: none"> Environmental Impact Management (Air quality control) Management of Key Material Aspects 	126-129 30-33	✓	-	-
4) Greenhouse gas management	<ul style="list-style-type: none"> GRI 305-1 Direct (Scope 1) GHG emissions GRI 305-2 Energy indirect (Scope 2) GHG emissions GRI 305-3 Other indirect (Scope 3) GHG emissions GRI 305-4 GHG emissions intensity GRI 305-5 Reduction of GHG emissions 	<ul style="list-style-type: none"> Responses to Climate Change Management of Key Material Aspects 	91-114 30-33	✓	-	-
5) Causing of impacts on and concerns to community and society	<ul style="list-style-type: none"> GRI 301-1 Materials used by weight or volume GRI 303: Water and Effluents 2018 GRI 305-7 Nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions GRI 306: Waste 2020 GRI 2-27 Compliance with laws and regulations GRI 413-1 Operations with local community engagement, impact assessments, and development programs 	<ul style="list-style-type: none"> Management of Key Material Aspects Environmental Impact Management Community and Social Stewardship 	30-33 126-140 185-202	✓	-	✓
6) Control of production process	<ul style="list-style-type: none"> GRI 302-1 Energy consumption within the organization GRI 302-4 Reduction of energy consumption GRI 305-5 Reduction of GHG emission 	<ul style="list-style-type: none"> Customer Relationship Management and Responsibility for Product and Delivery 	226-241	✓	-	✓

Management of Key Material Topics



Based on stakeholders' views, impacts from the Groups' operations concerned 7 areas. These 7 material issues are considered manageable and controllable risks. Preventive actions are in place to prevent the reoccurrence of actual impacts.

1. Occupational health and safety of employees and suppliers



Rationale	<ul style="list-style-type: none"> • Some activities, particularly at power plants, pose safety risks to employees. • The operation and maintenance of the Group's power plants is executed by major suppliers and a number of jobs, particularly concerning maintenance, are handled by their sub-contractors. Some jobs may pose safety risks to their workers. • Under-construction projects involve a number of operators, belonging to the Group, major suppliers and sub-contractors.
Risk and impact	<p>Accidents that put workers and their property in danger, leading to consequences on the company's operations, compliance, reputation and finance.</p>
Strategy and management approaches	<ul style="list-style-type: none"> • Supervise and monitor compliance with legislation, regulations and measures relating to safety, occupational health and labor as well as safety and occupational health measures specified in the EIA and/or the company's framework and guidelines to protect employees and all suppliers. • Assess job risks to identify possible dangers and severity, particularly high-risk jobs; define risk control measures prior to the start of work; and regularly monitor the execution. • Ensure operational safety through the Stop Work Authority, empowering job operators to stop unsafe work; refuse to perform the task when physical fitness or work environment or machine/equipment are not in good conditions; and apply international-standard occupational and safety standards to enhance risk management efficiency, and prevent dangers, work-related injuries, illness and loss of life. • Prepare the emergency response plan and conduct annual drills. • Prepare Business Continuity Plan and Crisis Management Plan to better contain the impacts and ensure business continuity. • Promote the health of the company's and suppliers' job operators with annual medical examination and special examination according to job descriptions or job risks. • Raise safety awareness among job operators, for proper knowledge and understanding in the risks and dangers of each job, proper operational methods for each job, the utilization of personal protection equipment, and the safety of work environment.
Target/year	<p>Zero accident</p>

2. Changes in ecosystems



Rationale	<ul style="list-style-type: none"> Power plants demand large land areas and that changes the natural conditions, biodiversity and the ecosystems in the areas. Power plants' construction and operational activities affects wild life habitats, their source of food, the ecosystem and aquatic organisms.
Risk and impact	Loss of biodiversity at the sites may affect some local plants and animals and may lead to extinction.
Strategy and management approaches	<ul style="list-style-type: none"> Define comprehensive assessment criteria for the risks and impacts on ecosystems. Set the policy not to locate projects in the areas that may pose high risks and impacts on historical or world heritage sites or areas that may affect rare and near-extinction living beings, based on the IUCN's Red Lists. Comply with relevant legislation and regulations as well as the corrective and preventive measures in the EIA and report the compliance results. Adopt Mitigation Hierarchy or guidelines to achieve no net loss of biodiversity in preventing risks and restoring biodiversity at all projects through risk assessment, impact mitigation, restoration and development of replacement areas to replenish the loss; and integrate them into the investment decision-making process.
Target	<ul style="list-style-type: none"> Positive impacts on the projects' ecosystems. An increase in/abundance of restored and rehabilitated forest areas (carbon sequestration capacity)

3. Air quality management



Rationale	<ul style="list-style-type: none"> Fuel combustion at fossil fuel power plants releases pollutants to the atmosphere. Power plants are required by law to conduct an analysis on air quality impacts and to define mitigating and preventive measures so that emissions are within permissible limits.
Risk and impact	Deficiency in power plants' pollutant elimination and control systems may end up with the release of pollutants beyond permissible limits, which will affect community and the environment as well as the company's reputation and finance following legal non-compliance.
Strategy and management approaches	<ul style="list-style-type: none"> Completely comply with environmental laws and all EIA measures and maintain the air quality within legal requirements. Design and apply efficient technology in eliminating/reducing pollutants in the production process for each type of power plant and its choice of fuel. Devise the system to prevent and deal with near-limit pollutants, with alert system and response guidelines when the level of pollutants is likely to exceed permissible limits. Install the stack monitoring system to monitor the air quality and efficiency of the air pollutant prevention and elimination system and meet legal requirements; and report the results online to the control room and regulators. Monitor the air quality in sensitive or community areas around the clock or according to schedules.
Target/year	<ul style="list-style-type: none"> No complaint concerning environmental issues. No penalties as a result of non-compliance with environment laws/requirements.

4. Greenhouse gas management



Rationale	<ul style="list-style-type: none"> The electricity generation business, the company's main business, is the large source of greenhouse gas emission and greenhouse gases cause global warming and climate change. RATCH's investment involves fossil fuel power plants which use natural gas and coal as fuels and they raise the volume of the company's emissions. Global efforts to reduce greenhouse gas emissions in the energy industry, particularly fossil fuel electricity generation, to limit the rise in global temperatures.
Risk and impact	Enforcement of laws to limit/control emissions like carbon tax, which will affect the company's business strategy, financial targets, business growth and sustainability.
Strategy and management approaches	<ul style="list-style-type: none"> Devise the Climate Change Strategy and study greenhouse gas management and reduction approaches, to set reduction target and pave way for carbon neutrality in 2050. Set the target to raise renewable energy capacity to at least 25% of total capacity in 2025 and set sight on the development of hydrogen fuel for the energy transition. Diversify into energy technology and innovations that support the carbon neutrality/net zero targets. Promote tree growing and conserve forests for carbon sinks.
Target/year	Reduce GHG emission intensity and carbon footprint of electricity unit.

5. Community and society's concerns



Rationale	Power plants' operations may cause negative impacts on the environment, farming activities, public health and community's safety.
Risk/impact	Community concerns may tarnish confidence in the power plants and the company's operations and may lead to conflicts.
Strategy and management approaches	<ul style="list-style-type: none"> Communicate with community with accurate information for their understanding and confidence. Build up community engagement, involving community in power plant inspection and in community development activities. Promote the quality of life in terms of education, local economy, public health, religion, culture, environmental preservation and community supports. Establish a channel to receive complaints and disseminate data.
Target/year	<ul style="list-style-type: none"> No complaint from any community. Community satisfaction.

6. Work conditions for employees/suppliers/sub-contractors



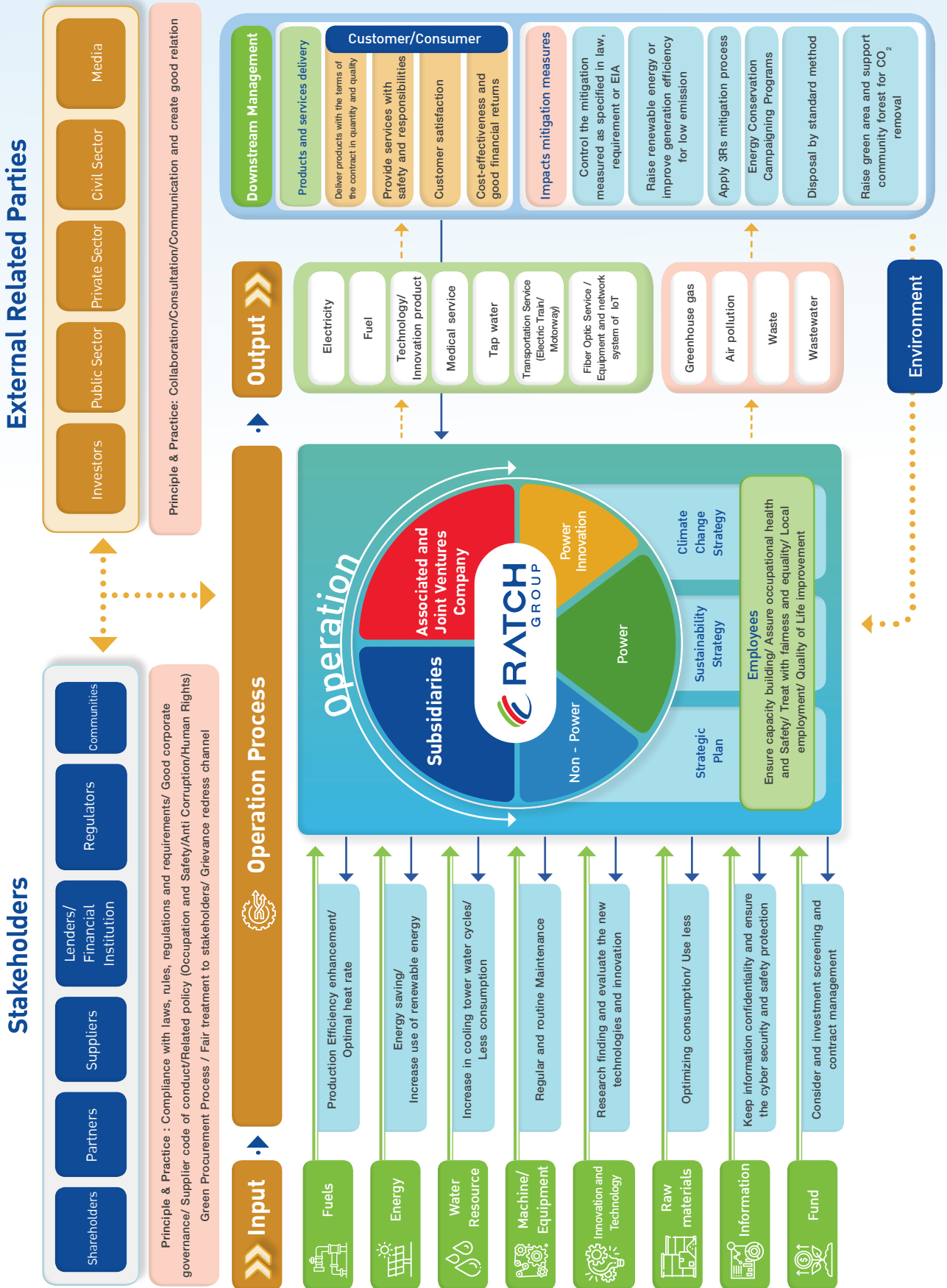
Rationale	Power plant construction and maintenance activities take place in danger areas and are handled by main suppliers and sub-contractors.
Risk/Impact	High-risk jobs such as jobs in confined space and on high ground are likely to cause harm to job operators, without prudent safety measures, and that will harm the company's operations, reputation and finance following legal non-compliance.
Strategy and management approaches	<ul style="list-style-type: none"> • Assess the associated risks of all high-risk jobs like work in confined space, hot work that causes heat and sparks, work on high ground or work with chemicals; devise safety measures before the start of work; and monitor the work at all time. • Inspect work areas, designate a responsible person; and set inspection frequency according to the risk level. High-risk jobs require inspection at all time. • Assess/check work environment prior to the start of work, during the work process and after completion. If the work environment is unsafe or below standard, job operators can stop work or refuse to perform the task. • In case of accident, set the investigation process as well as corrective and preventive measures to prevent reoccurrences. The measures may involve the correction of unsafe conditions of work areas, the installation of additional safety equipment, the inspection of tools and equipment, safety training, etc.
Target/year	Zero accident.

7. Product/service delivery control



Rationale	Electric power is the company's key revenue generator. The generation and delivery must meet the specifications in the power purchase agreements, in quantity and quality terms.
Risk/impact	Inability to satisfy customers' specifications on production and delivery can harm the national energy security and that will affect the company's reputation and finance following non-compliance with PPAs.
Strategy and management approaches	<ul style="list-style-type: none"> • Fulfil the PPAs with complete delivery of products and services. • Maintain power plants' Equivalent Availability Factor (EAF) and Heat Rate as specified in PPAs. • Maintain power plant's production efficiency to achieve the customers' specified Availability. • Keep the environmental quality within the limits allowed by laws and EIA and acceptable for community. • Communicate and ensure engagement through meetings and regular exchanges of opinions.
Target/year	<ul style="list-style-type: none"> • Evaluation of customer satisfaction. • No compliant relating to environmental issues.

Value Chain of RATCH's Business



RATCH Business Profile



RATCH Group Public Company Limited was established on 7 March 2000 with issued and paid up capital of THB21,749,999,850. It is listed on the Stock Exchange of Thailand under the stock symbol of “RATCH”. The company’s Head Office is located at 72 Ngam Wong Wan Rd, Bangkhen, Muang Nonthaburi, Nonthaburi Province.

Nature of Business

RATCH operates as a holding company with interests in a number of entities involving mainly electricity generation and non-power business which covers infrastructure, electricity and energy-related businesses, healthcare, water service, communications, etc. At present, the company directly and indirectly invests in a total of 72 subsidiaries and joint ventures.

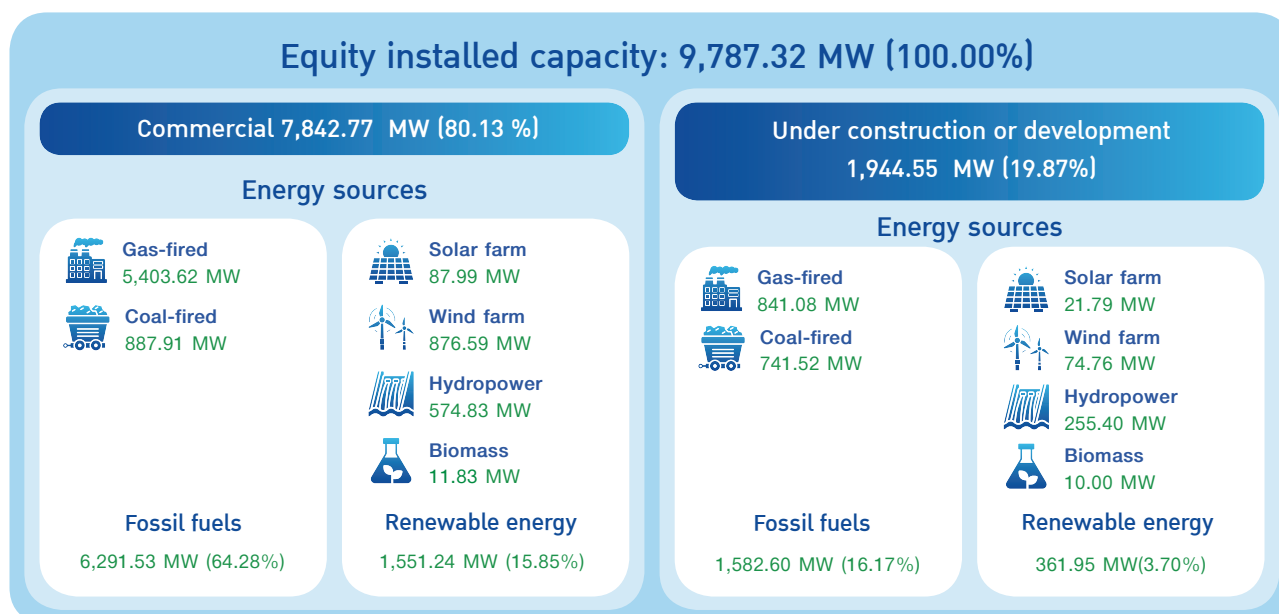
Type of entity	No. of entities	No. of electricity generation entities		No. of non-business entities	
		In Thailand	Abroad	In Thailand	Abroad
Subsidiaries	29	11	14	3	1
Joint ventures	43	16	13	13	1

Business Structure

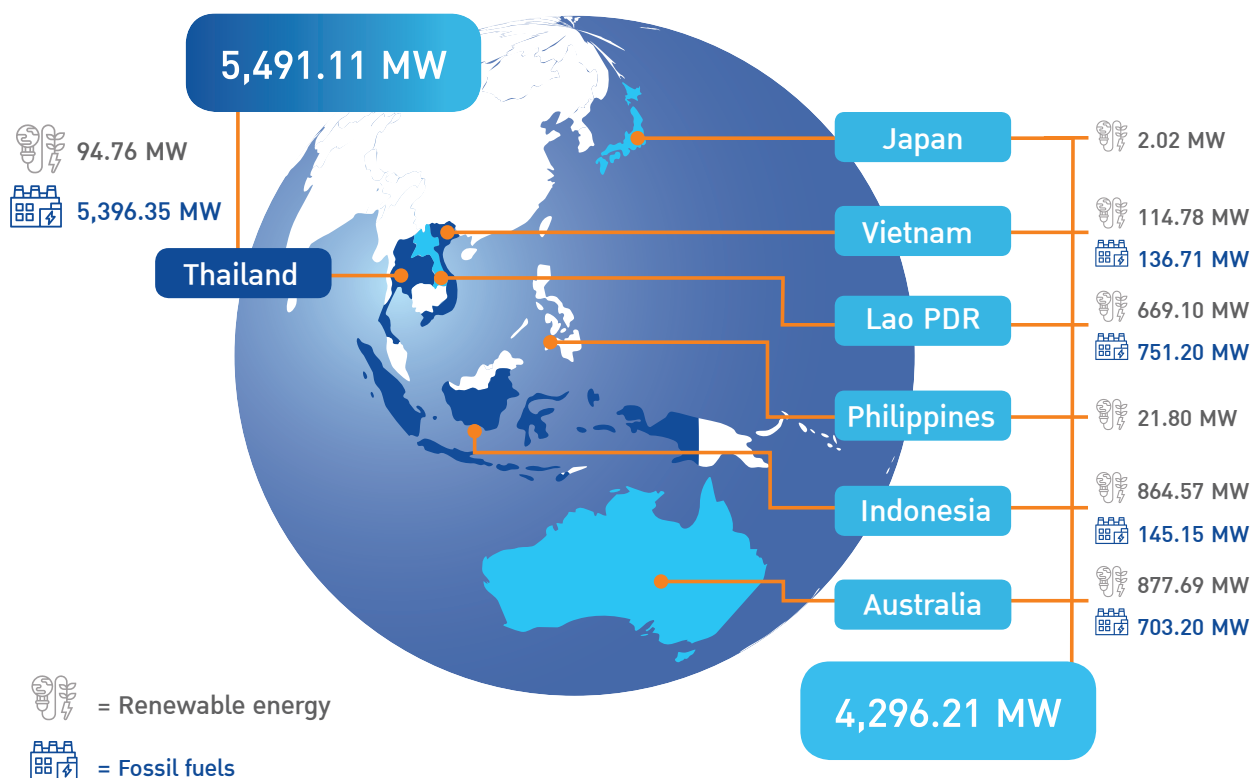
RATCH’s investment is classified into two main categories - electricity generation and non-power business.

Electricity Generation

The electricity generation business is the principal contributor of the company’s stability. As of 31 December 2022, the equity installed capacity reached 9,787.32 megawatts (MW); 7,874.13 MW from fossil fuels and 1,913.19 MW from renewable energy sources.



Installed Capacity in Thailand and Abroad



Electricity Generation Investment Projects

Type	Location	Name of power plant	Installed capacity (MW)	Shareholding	Operating control	Equity installed capacity (MW)	Status
Gas-fired	Thailand	Ratchaburi	3,645.00	100.00	Yes	3,645.00	Operating
		Ratchaburi Power	1,490.00	25.00	No	372.50	Operating
		Hin Kong	1,540.00	51.00	Yes	785.40	Operating
	Australia	Kemerton	315.20	100.00	Yes	315.20	Operating
		Townsville	234.00	100.00	Yes	234.00	Operating
		Snapper Point	154.00	100.00	Yes	154.00	Operating
	Indonesia	Riau	296.23	49.00	No	145.15	Operating
Coal-fired	Lao PDR	Hongsa	1,878.00	40.00	No	751.20	Operating
	Vietnam	Thang Long	620.00	22.05	No	136.71	Operating
	Indonesia	Paiton	2,045.00	36.26	-	741.52	Under share purchase finalization

Type	Location	Name of power plant	Installed capacity (MW)	Shareholding	Operating control	Equity installed capacity (MW)	Status
Gas-fired cogeneration	Thailand	RATCH-Cogeneration	119.75	100.00	Yes	119.75	Operating
		RATCH-Cogeneration (Extension Part)	31.20	100.00	Yes	31.20	Under-construction
		Nava Nakorn	139.13	40.00	Yes	56.64	Operating
		Nava Nakorn extension part 1	59.98	40.00	Yes	23.99	Operating
		Nava Nakorn extension part 2	30.00	40.00	Yes	12.00	Under-construction
		Ratchaburi World Cogeneration	235.00	40.00	No	94.00	Operating
		Berkprai Cogeneration	99.23	35.00	Yes	34.81	Operating
		Nexif RATCH Energy Rayong	98.00	100.00	Yes	98.00	Operating
		Sahacogen (Chonburi)	214.00	51.67	Yes	110.57	Operating
		REN Korat	31.20	40.00	Yes	12.48	Under-construction
Wind farm	Thailand	Huay Bong 2	103.50	20.00	No	20.70	Operating
		Huay Bong 3	103.50	20.00	No	20.70	Operating
	Australia	Collector	226.80	100.00	Yes	226.80	Operating
		Mount Emerald	180.45	100.00	Yes	180.45	Operating
		Yandin	214.20	70.00	No	149.94	Operating
		Lincoln Gap 1 & 2	212.00	100.00	Yes	212.00	Operating
		Starfish Hill	33.00	100.00	Yes	33.00	Operating
		Toora	21.00	100.00	Yes	21.00	Operating
	Vietnam	Windy Hill	12.00	100.00	Yes	12.00	Operating
		Ecowin	29.70	51.04	No	15.16	Under-construction
Solar farm	Thailand	Ben Tre	80.00	74.50	No	59.60	Under-construction
		Solar Power 3, 4, 7	21.60	40.00	No	8.64	Operating
		Solarta (8 projects)	42.30	49.00	Yes	20.73	Operating
		ATCE 1-5	29.00	15.53	No	4.50	Operating
		PPS and MRS	7.40	15.53	No	1.15	Operating
	Impact Solar	12.60	51.67	No	6.51	Operating	
	Australia	Collinsville	42.50	100.00	Yes	42.50	Operating
	Japan	Nanao and Nogata	13.00	15.53	No	2.02	Operating
	Lao PDR	EDL-Gen portfolio	-	-	No	1.94	Under-construction
	Philippines	Calabanca	74.10	29.40	Yes	21.80	Under-construction

Type	Location	Name of power plant	Installed capacity (MW)	Shareholding	Operating control	Equity installed capacity (MW)	Status
Biomass	Thailand	Songkhla Biomass	9.90	40.00	Yes	3.96	Operating
		Sahacogen Green Biomass Lamphun	9.60	51.67	Yes	4.96	Operating
		Sahagreen Forest Biomass Kamphaengphet	5.63	51.67	Yes	2.91	Operating
Hydropower	Lao PDR	Nam Ngum 2	615.00	25.00	No	153.75	Operating
		Xe Pian-Xe Namnoy	410.00	25.00	No	102.50	Operating
		Sekong 4A-B	355.00	60.00	Yes	213.00	Under-construction
		EDL-Gen portfolio	1,137.15	10.11	No	197.91	Operating
	Indonesia	Asahan-1	180.00	47.89	No	86.20	Operating
		Sibundong	73.70	50.00	No	36.85	Under-construction
	Vietnam	Coc San	29.70	58.48	No	17.37	Operating
		Song Giang 1	12.00	46.23	No	5.55	Under-construction
		Song Giang 2	37.00	46.23	No	17.10	Operating
Battery Energy Storage System for grid stability	Australia	Lincoln Gap 2	10.00	100.00	Yes	10.00	Under-construction
Total			17,618.25			9,787.32	

Non-Power Business

RATCH emphasizes investment in electricity and energy-related businesses, from upstream to downstream of the value chain in which the company has expertise, as well as other businesses with long term growth potential that cater for infrastructure demand and basic needs of the economy and society. The investment is targeted to hit 5% of total investment in 2023. The following below shows the investment in non-power business as of year 2022.

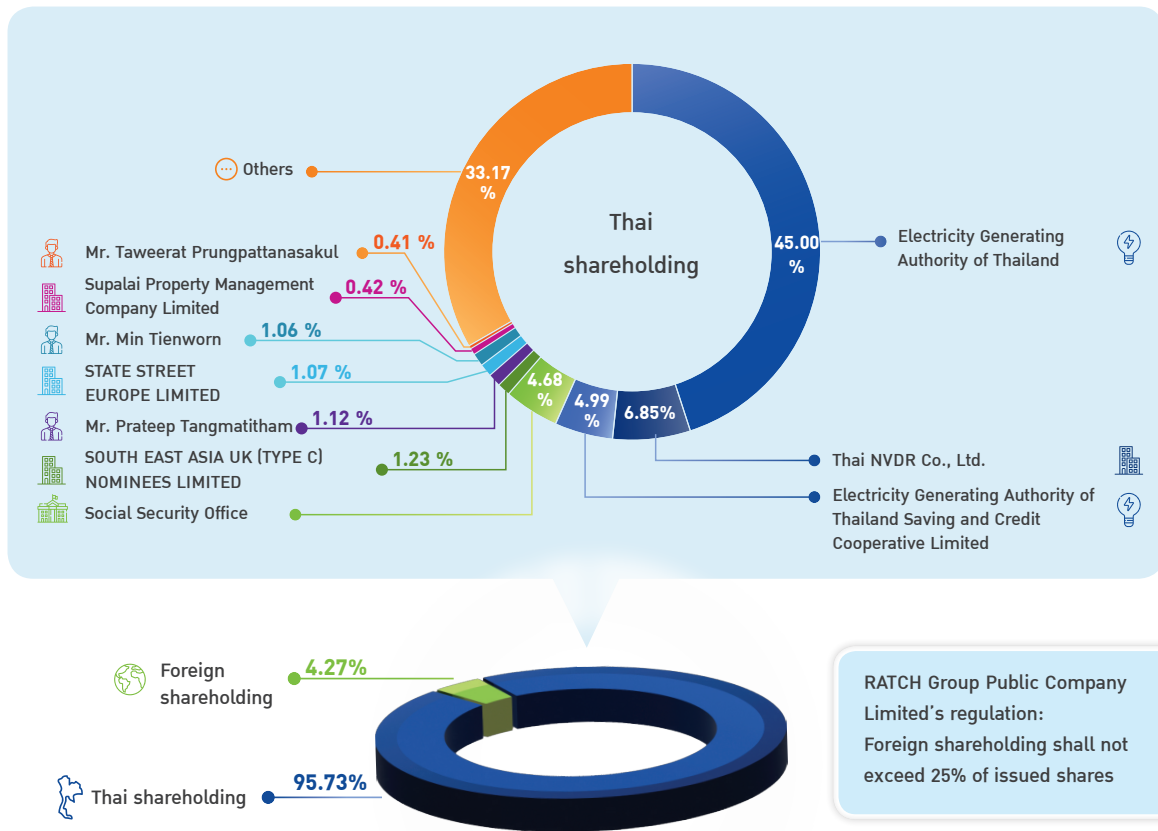
Subsidiary/Joint venture	Shareholding (%)	Equity investment (Baht million)	Nature of business	Customer
Type of business: Transport infrastructure				
Location: Thailand				
Northern Bangkok Monorail Co., Ltd.	10.00	1,440.00	Implement a Public Private Partnership scheme involved in the provision of engineering design, machinery and electrical systems, operation and maintenance services for 34.5-km MRT Monorail Pink Line Project (Khae Rai-Min Buri); and the 3-km extension part from Srirat Station to Muang Thong Thani under a 33-year and 3-month concession.	General public - Scheduled for operations in July 2023
Operational control: No				

Subsidiary/Joint venture	Shareholding (%)	Equity investment (Baht million)	Nature of business	Customer
Type of business: Transport infrastructure (Continue)				
Eastern Bangkok Monorail Co., Ltd. Operational control: No	10.00	1,440.00	Implement a Public Private Partnership scheme involved in the provision of engineering design, machinery and electrical systems, operation and maintenance services for 30.4-km MRT Monorail Yellow Line Project (Lat Phrao-Samrong) under a 33-year and 3-month concession.	General public - Scheduled for operations in June 2023
BGSR 6 Co.,Ltd. Operational control: No	10.00	100.00	Implement a Public Private Partnership scheme involved with the operation and maintenance (O&M), design, construction and maintenance of civil works and the fee-collecting system of Bang Pa-in - Nakhon Ratchasima Highway (M6) under a 33-year concession.	General public (Scheduled for operations in 2024)
BGSR 81 Co.,Ltd. Operational control: No	10.00	85.00	Implement a Public Private Partnership scheme involved with the operation and maintenance (O&M), design, construction and maintenance of civil works and the fee-collecting system of Bang Yai - Kanchanaburi Highway (M81) under a 33-year concession.	General public (Scheduled for operations in 2024)
Type of business: Communication technology network				
Location: Thailand				
Smart Infranet Co.,Ltd. Operational control: No	51.00	280.50	Provide rental fiber optic communications networks on CBD roads and Bangkok's ring-roads, as well as on telegraph poles and railroads nationwide	Corporate customers
Things on Net Co.,Ltd. Operational control: No	35.00	180.02	Provide an integrated IoT (Sigfox) solution services from consulting to strategic planning and IoT data analytics as well as distribution of sensor sets, IT platform and IoT solutions such as asset tracking management, waste management, safety and environment, smart farming and smart city solutions.	Corporate and retail customers
Type of business: basic need Infrastructure				
Location: Lao PDR				
Asia Water Co.,Ltd. Operational control: No	40.00	179.11	Produce and distribute tap water with a capacity of 24,000 cubic meters per day in Phase 1 since December 2018, scheduled for capacity increase to 48,000 cubic meters per day in 2041.	Nakhonluang Water Supply Enterprise of Lao, Vientiane capital (under a 50-year concession)

Subsidiary/Joint venture	Shareholding (%)	Equity investment (Baht million)	Nature of business	Customer
Type of business: Fuel supply service				
Location: Thailand				
Songkhla Biofuel Co.,Ltd. Operational control: No	40.00	0.40	Provide biomass fuel to Songkhla Biomass Power Plant.	Songkhla Biomass Co.,Ltd.
Bangkok Aviation Fuel Services Public Co.,Ltd. Operational control: No	15.53	2,712.14	Provide integrated aviation fuel services at Bangkok International Airport, Don Mueang International Airport, and the airports in Samui, Sukhothai and Trat, and invest in foreign and domestic renewable energy businesses.	Corporate customers
Location: Lao PDR				
SIPHANDONE RATCH-LAO Co.,Ltd. Operational control: No	25.00	57.91	Cultivate fast-growing trees in a concession plot with approximately 20,000 rai in Champassak and plan for commercial operations in 2024.	Kyuden Mirai Energy Co.,Ltd. under a 15-year contract for 100,000 tons
Phufai Mining Co.,Ltd. Operational control: No	37.5	630.00	Operate a lignite mining concession for sale to Hongsa Thermal Power Plant.	Hongsa Power Co.,Ltd.
Type of business: Healthcare service				
Location: Thailand				
Principal Capital Public Co.,Ltd. Operational control: None	10.00	1,557.71	Provide healthcare services in secondary cities across the country with expertise in private hospital management, currently having 13 hospital and planning to expand its primary care network for universal health cardholders to 100 clinics nationwide .	General public
Principal Healthcare Sakhon Nakhon Co.,Ltd. Operational control: No	25.00	75.00	Provide healthcare service and operate Princ Sakhon Nakhon Hospital .	General public (partial opening service for 59 beds)
Location: Lao PDR				
Bangkok Chain International (Lao PDR) Co.,Ltd. Operational control: No	9.91	190.00	Provide healthcare service and operate Kasemrat International Hospital in Vientiane that offer integrated tertiary care with 110 beds initially (to be 254 beds in total eventually) and 43 clinic rooms.	General public

Subsidiary/Joint venture	Shareholding (%)	Equity investment (Baht million)	Nature of business	Customer
Type of business: Electricity and energy innovation				
Location: Thailand				
Innopower Co.,Ltd. Operational control: No	30.00	180.00	<ul style="list-style-type: none"> Facilitate investment in new businesses concerning energy innovation, efficiency enhancement, management of energy and future energy, and energy startups Invent innovations on renewable energy, electric power trading, electricity storage, smart grid and electric vehicles Invest in the development of EV Kit, smart grid test system, garbage and hyacinth-collecting vessel, insulator-cleaning robot, energy storage system and co-ordinate analysis/display program as well as in Regional Energy Trading Co.,Ltd. 	Corporate customers
Type of business: Power plant operation and maintenance				
Location: Thailand				
Chubu Ratchaburi Electric Service Co.,Ltd. Operational control: Yes	50.00	10.00	Provide operation and maintenance services for 1,420 MW Ratchaburi Power's Power Plant in Ratchaburi Province.	Ratchaburi Power Co.,Ltd.
Type of business: Maintenance of power plant parts				
Location: Thailand				
EGAT Diamond Service Co.,Ltd. Operational control: Yes	10.00	62.30	Provide refurbishment service for power plants' gas turbine.	Corporate customers
Type of business: Investment in power related business and energy stocks				
Location: Lao PDR				
RATCH-Lao Services Co.,Ltd. Operational control: Yes	99.99	336.86	Provide O&M personnel and invest in electricity and energy-related businesses in Lao PDR.	Corporate customers
EDL - Generation Public Co.,Ltd. Operational control: Yes	10.11	3,312.88	Hold shares in EDL-Gen, a producer of hydropower and solar power listed on Lao Securities Exchange via subsidiaries, RATCH-Lao Services Co.,Ltd. (5.65%) and RH International (Singapore) Corporation Pte. Ltd.	Customers in Lao PDR and neighboring countries

Shareholding Structure (As of 12 September 2022)



Top 10 shareholders as of 12 September 2022

Rank	Shareholder	No. of shares	%
1	Electricity Generating Authority of Thailand	978,750,000	45.00
2	Thai NVDR Co., Ltd.	148,980,460	6.85
3	Electricity Generating Authority of Thailand Saving and Credit Cooperative Limited	108,503,293	4.99
4	Social Security Office	101,870,550	4.68
5	SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	26,671,380	1.23
6	Mr. Prateep Tangmatitham	24,372,050	1.12
7	STATE STREET EUROPE LIMITED	23,180,101	1.07
8	Mr. Min Tienworn	23,000,000	1.06
9	Supalai Property Management Company Limited	9,029,900	0.42
10	Mr. Taweerat Prungpattanasakul	9,000,000	0.41
Total		1,453,357,734	66.83
Other shareholders		721,642,251	33.17
Grand total		2,174,999,985	100.00


Shareholders by nationality	No. of shareholders	No. of shares	%
Thai	52,273	2,082,028,428	95.73
Foreign	151	92,971,557	4.27
Total	52,424	2,174,999,985	100.00


No. of voting shares	% of all issued shares	No. of non-voting shares	% of all issued shares
2,026,019,525	93.15	148,980,460	6.85


Revenue Structure


01 Revenue from electricity sales and services and revenue from lease contracts:
The majority of the company's revenue generated by the power business. It covers revenues determined accordingly to power purchase agreements of each power plant and the electricity structure in each country such as

- Availability Payment
- Energy Payment
- Capacity Payment
- Fuel Saving
- The price of energy and steam distributed to industrial users.



02 Profit sharing from associated and joint venture companies 

03 Dividends from subsidiaries and the company's investment 

04 Other revenues covering interest income, management service and others. 

Organization scale

In 2022, RATCH employed 520 workers for its operations in Thailand and overseas (excluding outsourcing); male, 354 (68.08%); and female, 166 (31.92%). The number increased by 46 persons or 9.70% from the previous year.

Country	Gender	No. of employees				Total
		Thai nationality	Lao nationality	Australian nationality	Other nationalities	
Thailand	Male	132	0	0	0	132
	Female	138	0	0	0	138
Lao PDR	Male	4	192	0	0	196
	Female	2	21	0	0	23
Australia	Male	2	0	16	0	18
	Female	0	0	4	0	4
Indonesia	Male	4	0	0	0	4
	Female	0	0	0	0	0
Vietnam	Male	4	0	0	0	4
	Female	1	0	0	0	1
Total		287	213	20	0	520

More information in Performance Data Page 249

Stakeholder engagement

As a holding company that involves with multiple business, RATCH has developed involvement and connection with multiple stakeholder groups that have experienced or may experience the impacts from its operations. To raise the confidence of stakeholders in the value chain, from upstream and midstream and downstream, RATCH puts relationship building an essential part of its operations, aside from continuous impact mitigation and creation of positive impacts in response to the needs and expectations of each stakeholder group.



Analysis of value chain

Understanding and get the whole picture of nature of business and supply chain of business operated by the Group of companies concerning power and non-power businesses.

Identify relevant stakeholders in the value chain that have experienced or may experience positive and negative impacts from the Group of companies' operations.



Identification of stakeholders



Analysis of stakeholders' roles

Analyze the direct and indirect connectivity of stakeholders that have experienced or may experience impacts from each stage of the Group of companies' operations.

Prioritize stakeholders accordingly to the degrees of impacts, to make the list of the most and least sensitive to direct/indirect impacts and the list of stakeholder groups that matter most or least to business achievements.



Prioritization of stakeholders



Establishment of stakeholder engagement and response guidelines

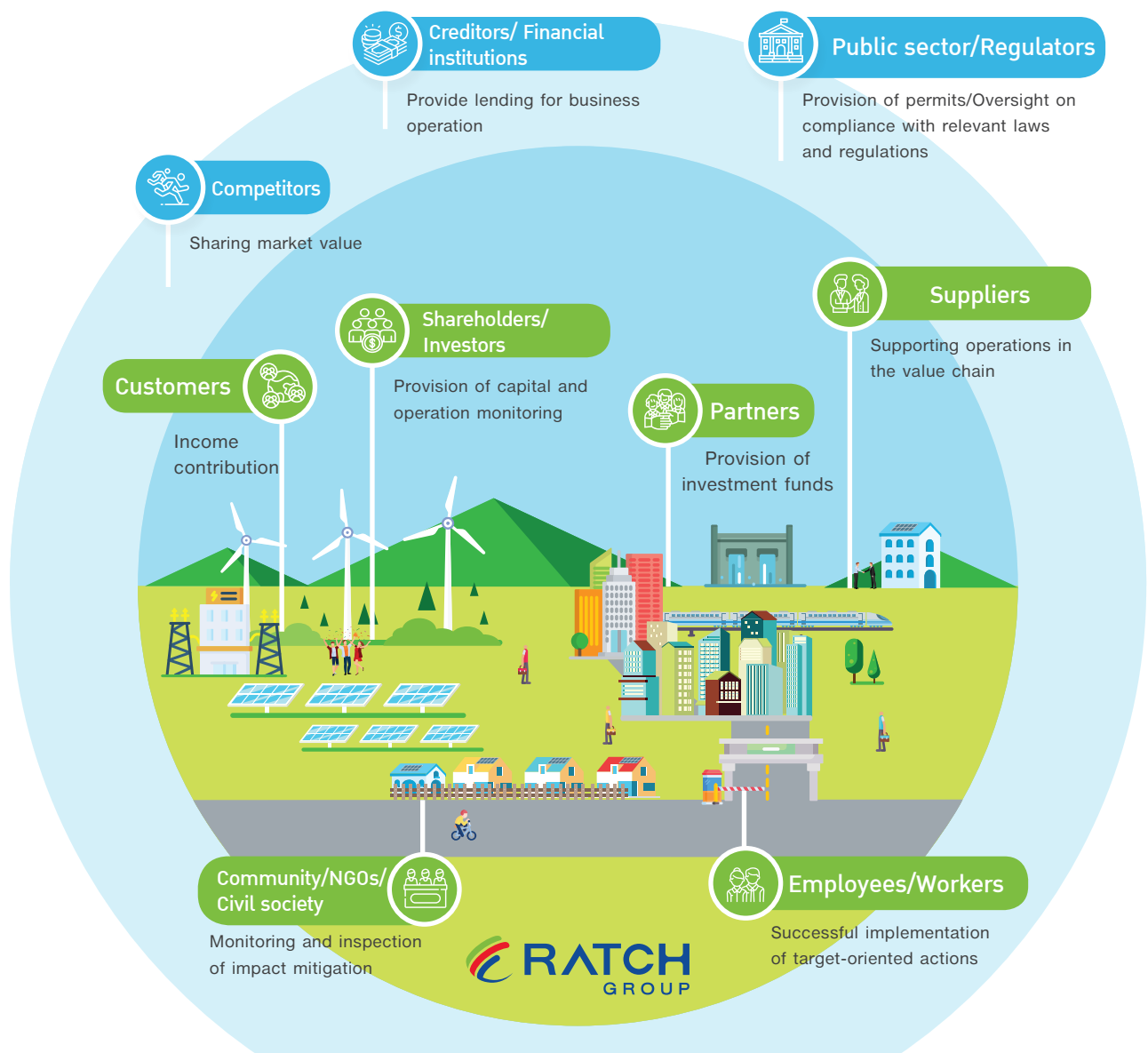
Establish impact mitigation guidelines:

1. Analyze the impacts and stakeholder expectations.
2. Formulate the plans to mitigate impacts, manage relationship and promote engagement.
3. Implement the plans accordingly to prescribed approaches and engagement channels via responsible units.
4. Reflect and disclose the implementation results through communication.
5. Put in place whistleblowing/problem-solving channels.

Identification of stakeholders

Based on the assessment of direct and indirect economic, social, environmental and human rights-related impacts from each stage of all projects/business entities of the Group of companies on all stakeholders, the stakeholders can be classified into the following groups:

Stakeholders impacted by the Group of companies' operations	Dimension of impact			
	Economic	Social	Environmental	Human rights
1. Employees/Workers	✓	✓	✓	✓
2. Vendors/Suppliers	✓	✓	✓	✓
3. Community/Society	✓	✓	✓	✓
4. Customers	✓	✓	✓	✓
5. Business partners	✓	✓	✓	✓
6. Regulators	-	✓	✓	✓
7. Shareholders/Investors	✓	✓	✓	✓
8. Creditors/Financial institutions	✓	-	✓	✓



Reduce and prevent negative impacts; create values and shared values for stakeholders; and protect the environment.



Guidelines on stakeholder engagement

RATCH has adopted proactive approaches in managing the relationship with stakeholders, particularly the most sensitive to operational impacts. The company has also gathered and welcomed each stakeholder group's expectations, to shape the operational guidelines that will reduce impacts and the likelihood and nurture the relationship accordingly to the guidelines in the Code of Conduct and engagement channels.

1. Employees/Workers 	
Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Violation of human rights principles • Unsafe work environment • Unfair pay 	<ul style="list-style-type: none"> • Appropriate income and welfare • Safe and favorable work environment • Continuous capability building • Appropriate career advancement
Guidelines 	<ul style="list-style-type: none"> • Set guidance for treatment of employees in line with laws and international standards. • Assess human rights risks and impacts thoroughly and define preventive and remediation measures in case of violation. • Ensure minimum safety measures as well as favorable and creativity-inspiring work environment. • Review remuneration and welfare on a regular basis to match necessary cost of living/ peer companies'. • Prepare job family group and individual training plans. • Establish succession and career development plans. • Establish the system and channels to receive employees' opinions and suggestions. • Promote and encourage activities that foster teamworking and innovation development, to strengthen corporate culture and engagement.
Engagement channel 	<ul style="list-style-type: none"> • Available compliant channels • Annual engagement survey • Function's engagement activities • Biannual "Meet Employees" events and function's meetings to communicate corporate strategies, targets and performance • Safety, Occupational Health and Work Environment Committee • Welfare Committee • Human Resources Steering Committee representing all functions • Performance Evaluation Steering Committee • Group training and knowledge-sharing activities • Communication of corporate messages and activities via e-mail, Intranet and available media <p>Complaint channel: https://www.ratch.co.th/en/anti-corruption-whistle-blowing/whistleblowing-channel</p>
Topic in this Report 	<ul style="list-style-type: none"> • Respect for human rights • Safety and occupational health • Employee stewardship • IT security and cybersecurity


2. Vendors/Suppliers



Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Violation of human rights • Unsafe work condition • Discriminatory procurement process 	<ul style="list-style-type: none"> • Professionalism and integrity • Transparent process • Compliance with contracts • Improvement in suppliers' operations
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Complete Supplier Code of Conduct and related rules as guidelines for interactions with suppliers and ensure suppliers' compliance with the Code and rules. • Assess human rights risks and impacts thoroughly and define preventive and remediation measures in case of violation. • Ensure safe work conditions in line with standards. • Ensure a transparent and international-standard procurement process to prevent conflict of interest. • Assess and select suppliers with equal and fair manner. • Prioritize suppliers to identify preferred suppliers, and evaluate suppliers before and after the employment. • Manage contracts under a clear management plan and impose a progress-tracking process and budget-control plans. • Discuss with suppliers to find mutually-agreed working solutions.
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Available compliant channels • Meetings with suppliers to discuss the procurement process for equitable access to information • Training/orientation prior to start of work; work permits; operation monitoring/control; and performance evaluation • Safety, Occupational Health and Work Environment Committee • Site visit to assess the operations of suppliers involving, for example, heavy machinery maintenance and waste disposal • Joint CSR projects <p>Company website: www.ratch.co.th</p>
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Supply chain management • Respect for human rights • Safety and occupational health • IT security and cybersecurity




3. Community and society



Actual/potential impacts	Expectations	
<ul style="list-style-type: none"> • Fight for resources and emissions of pollutants • Accidents/incidents/emergency events • Impacts on health/quality of life • Change in land use and way of life 	<ul style="list-style-type: none"> • Operations that underline legal compliance and responsibility for the environment and community • Timely and transparent information disclosure • Establishment of reliable engagement in operational inspection; and emergency response plan/drill prepared jointly with community • Engagement with the improvement in quality of life for community and society • Openness and timely responses to problems 	
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Apply production technology that meets minimum standards, to reduce environmental impacts on community/society. • Tackle environmental and safety issues in line with relevant laws and regulations and impose measures to constantly prevent risks to community. • Communicate with community through various two-way channels like social media networks, notifications, community visits and community development activities. • Build engagement through the establishment of Environmental Inspection Committee/ Tri-partite Committee that represent all parties in the inspection of power plants' environmental management; and capacity building for the committees. • Engage community with the outlining of emergency response, training and drill plans to raise their confidence in the handling of emergency incidents. • Prepare the plans to improve community's quality of life in various aspects - career, education and public health - to suit community needs. • Establish the channels to hear community opinions/recommendations, which will be integrated into the examination and improvement of the environmental, occupational health and safety management system. 	
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Opinion surveys in line with schedules in EIA reports • Site visits to power plants and/or other projects • Community engagement with the inspection of power plants and environmental management through, for example, the establishment of Environmental Inspection Committee and Tri-partite Committee • Whistleblowing channel as well as the prevention/remediation process • Training for community and their participation in power plants' emergency response drill • Community visit for relationship building • Activities to improve quality of life • Notification letters and power plants' newsletters <p>Tel : 02 794 9999</p> <p>Company website : www.ratch.co.th</p> <p>whistleblowing channel : https://www.ratch.co.th/en/anti-corruption-whistle-blowing/whistleblowing-channel</p> <p>https://www.ratch.co.th/en/contact-us</p>	
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Environmental impact management • Safety and occupational health • Community and social stewardship • Respect for human rights • Whistleblowing channel 	

4. Customers/Consumers






Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Violation of contractual agreements and terms • Deficiency in production control for the delivery of products/services that meet customers/consumers' specifications • Disclosure of customer information 	<ul style="list-style-type: none"> • Responses to customer needs in terms of power security • Safe production and delivery of products/services that meet specified volume and quality • Operations with good corporate governance and zero environmental impacts • Cooperation in problem solving and relationship building
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Operate in accordance with the contracts and terms with customers/consumers. • Operate strictly in line with the operation and maintenance schedule to maintain efficiency and availability, for prompt and efficient response to customers' requests and national power security. • Engage with customers in contract management and discussions on terms and disputes • Safeguard cybersecurity. • Constantly organize meetings and relationship-building activities for a good relationship. • Establish a channel to hear customers' opinions/recommendations, for further improvement.
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Meeting/Discussion with customers • Seminar to hear and exchange ideas • Communication channel with customers <p>Tel : 02 794 9999</p> <p>Company website : www.ratch.co.th</p>
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Customer relationship management and product responsibility • Supply chain management • IT security and cybersecurity • Responses to climate change • Environmental impact management






5. Business partners



Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Incompliance with legislation/contract terms. • Failure to achieve target returns • Exploitation of confidential information for business benefits 	<ul style="list-style-type: none"> • Financial stability and positive corporate image • Working team's reputation, capability, track records and professionalism • Management capability and corporate governance • Long-term partnership
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Treat partners in line with the guidelines in the Code of Conduct. • Uphold and comply with relevant business laws and regulations and the Human Rights Policy. • Strengthen the stability and confidence in the company's financial status and image. • Contribute the best effort in achieving positive results and reflecting working team's professionalism. • Operate transparently and nurture relationship for long-term partnership.
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Meetings with partners • Disclosure of performance to partners • Agreements • Site visit to jointly observe pilot projects/project progress
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Code of Conduct and legal compliance • Good corporate governance • Prevention of fraud, corruption and conflict of interest • Supply chain management

6. Regulators



Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Incompliance with legislation/contract terms • Sub-standard operation/production that causes severe impacts on community, society and the environment 	<ul style="list-style-type: none"> • Compliance with legislation, rules and regulations concerning operations in Thailand and abroad • Good corporate governance • Corporate capability in supporting government policies
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Define the supervisory roles and duties of each area comprehensively and sufficiently. • Establish a monitoring system for amendments in relevant business laws and regulations in Thailand and abroad, assess compliance on a regular basis, and report progress to the Management and the Board of Directors. • Apply for licenses and operate within permit conditions. • File complete reports as required by relevant laws and regulations. • Outline the environmental and safety management systems or other relevant systems. • Seek continuous recertification of Thai Private Sector Collective Action Against Corruption (CAC)'s membership. • Cooperate with regulators for greater enterprise sustainability. • Define clear prevention/rehabilitation/remediation measures for impacts on stakeholders
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Coordination and discussion on rules and regulations • Reporting • Company visit • Participation in incident inspection/investigation <p>Tel : 02 794 9999</p> <p>Company website : www.ratch.co.th</p>
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Code of Conduct and legal compliance • Good corporate governance • Prevention of fraud, corruption and conflict of interest • Economic performance • Environmental performance • Social performance

7. Shareholders/Investors



Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Failure to meet financial targets • Incompliance with laws and regulations concerning the economic, social, environmental and human rights aspects that harms corporate reputation and confidence in the company 	<ul style="list-style-type: none"> • Ability to manage ESG risks and execute sustainability strategies • Ability to generate good returns • Corporate governance • Professionalism and operational excellence • Adaptability to transitions and emerging risks • Short, medium and long-term strategies and targets on corporate growth • Efficiency in monitoring and preventing fraud and corruption
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Strive to generate positive returns. • Exhibit capability in managing ESG (Environmental, Social and Governance) risks and executing the sustainability strategy. • Demonstrate the Board of Directors' good governance. • Improve human resource capabilities for professionalism and organizational excellence. • Prepare the organization for technological changes and emerging. • Outline short, medium and long-term strategies and targets on corporate growth. • Assess fraud-related risks and establish supervisory measures to prevent fraud and corruption.
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Annual General Meeting • Meeting with EGAT • Analyst Meeting • Company visit/Site visit • Roadshow • Information disclosure via mass media and corporate website. • Annual Report/Sustainability Report • Responses to ESG/sustainability questionnaire of external organizations <p>Company website : www.ratch.co.th</p>
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Economic, environmental and social performance in 2022 • Good corporate governance • Code of Conduct and legal compliance • Prevention of fraud, corruption and conflict of interest

8. Creditors/Financial institutions



Actual/potential impacts	Expectations
<ul style="list-style-type: none"> • Inability to operate as specified in loan terms • Failure to meet payment schedules 	<ul style="list-style-type: none"> • Credible company ratings • Efficiency and ability in revenue and profit generation • Ability to repay loans • Investment and funding plans for project acquisition • Ability to manage financial risks (interest rates and exchange rates) • Continuity in good relationship • Corporate credibility, reputation and governance
<p>Guidelines</p> 	<ul style="list-style-type: none"> • Ensure the operations and information disclosure in line with the terms and conditions agreed with creditors/financial institutions. • Ably manage the revenue, cost and returns. • Ably manage ESG (Environmental, Social and Governance) risks and the implementation of sustainability strategies. • Maintain credit ratings at the Investment Grade. • Strictly follow loan repayment plans to achieve creditor confidence. • Conduct the revenue analysis and forecast and manage financial risks. • Seek low-cost funds that match each type of project. • Strictly follow the company's financial and tax policies. • Safeguard confidentiality and communicate with creditors for prompt solutions.
<p>Engagement channel</p> 	<ul style="list-style-type: none"> • Meeting with creditors/financial institutions • Report/disclosure of information per relevant terms and conditions • Site visit to observe project progress • Business agreements that also concerns the safeguarding of confidential information <p>Tel : 02 794 9999</p> <p>Company website : www.ratch.co.th</p>
<p>Topic in this Report</p> 	<ul style="list-style-type: none"> • Good corporate governance • Code of Conduct and legal compliance • Risk management and internal control • Economic performance in 2022

More information appears in Form 56-1 One Report.



More information
appears in Form 56-1
One Report

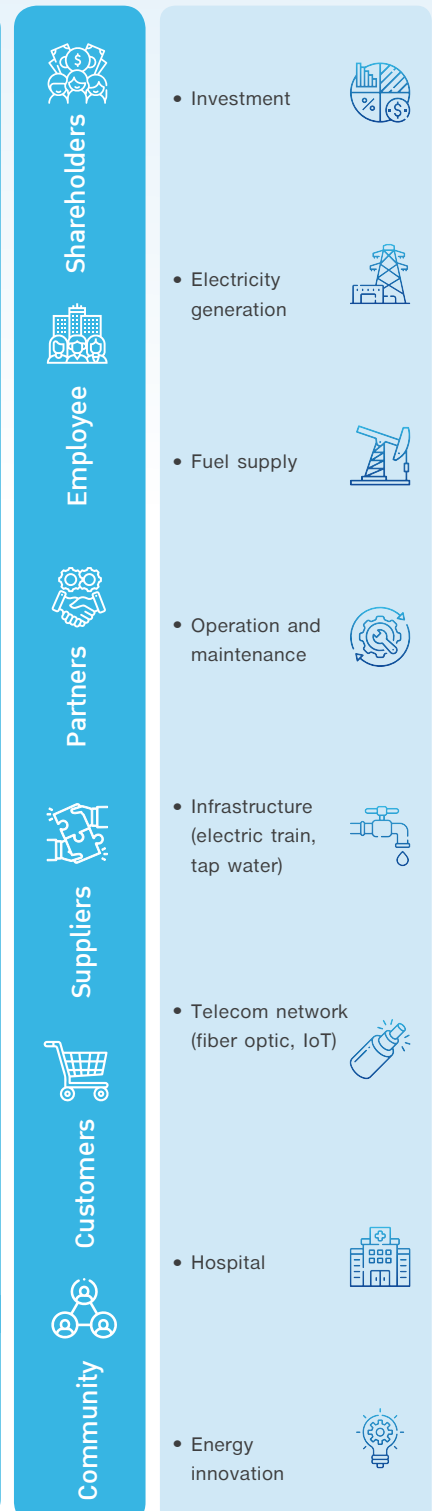
Stakeholder Engagement to Create Shared Value

RATCH engages with stakeholders through communications and channels to hear their views, for further improvement in the operations that will enable the company to best address stakeholders' needs and expectations and create shared value for stakeholders and the environment.







1. Inputs









2. Business Activities



3. Outputs

 <p>Produced and distributed electric power 28,238,370 MWh</p>	 <p>Scope 1 and Scope 2 GHG emissions 8.59 MtCO₂e</p>	 <p>Volume of treated wastewater reuse 1,075,842 m³</p>	 <p>Saved energy 5,775 MWh</p>	 <p>Water discharge 2,723,217 m³</p>	 <p>Non-hazardous waste for disposal 461.61 tons</p>
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4. Impacts

 <p>Financial capital</p>	<p>Key results</p> <ul style="list-style-type: none"> Sales revenue Baht 74,725.22 million Revenue from profit sharing Baht 5,391.16 million Revenue from renewable : Baht 5,410.35 million EBITDA Baht 12,811.71 million The company's profit Baht 5,782.07 million Return on equity 60.19% 	<p>Supporting activities</p> <ul style="list-style-type: none"> Efficient cost management Liquidity and capital management Allocation of returns to shareholders
 <p>Manufactured capital</p>	<p>Key results</p> <ul style="list-style-type: none"> Total capacity increase to 9,787.32 MW Renewable capacity: 1,913.19 MW Produced and distributed electricity from renewable energy : 3,480,497 MWh Continuity in production licenses 	<p>Supporting activities</p> <ul style="list-style-type: none"> Continuous environmental investment Continuous reduction in energy use and GHG emissions
 <p>Intellectual capital</p>	<p>Key results</p> <ul style="list-style-type: none"> Investment 30% equity of Innopower Co., Ltd invested total values of baht 180 million as an investment arm in energy and sustainability-linked innovations Innopower Co., Ltd., invested total values of 460 million baht in energy efficiency management startups, net-zero-emission innovation focused funds, and innovations related EV business value chain 	<p>Supporting activities</p> <ul style="list-style-type: none"> Continuously invest in emissions-related innovations Explore innovations in other areas like Health Tech Set the innovation business's revenue targets Develop personnel's specialized expertise in support of innovation investment
 <p>Human capital</p>	<p>Key results</p> <ul style="list-style-type: none"> Turnover rate: 4.63% Training expenses: Baht 8,133,326.20 million Training hours: 30hrs./person/year LTI/FR 0 /TIFR 0.03 per 200,000 hours worked Employee engagement score 82.56% 	<p>Supporting activities</p> <ul style="list-style-type: none"> Continuously invest in capacity building Manage remuneration, welfare and benefits in support of employees' quality of life Ensure standard safety, occupational health and work environment Promote employees' good health
 <p>Social capital</p>	<p>Key results</p> <ul style="list-style-type: none"> No community Complaint Customer satisfaction: 92.96% No. of new suppliers: 389 suppliers 	<p>Supporting activities</p> <ul style="list-style-type: none"> Nurture collaboration and good relationships Welcome opinions, jointly solve problems and respond to social needs Continuously promote and support the development of community quality of life
 <p>Natural capital</p>	<p>Key results</p> <ul style="list-style-type: none"> Volume of renewable energy electricity: 3,480,497 MWh Volume of internal renewable energy use: 13,860 MWh Volume of saved energy: 5,775 MWh Volume of water reuse: 1.5 m³ Scope 1 & 2 GHG intensity: 0.4198 Volume of reused and recovered waste: 29,819 tons Certified carbon credits: 4,967 tCO₂e Rehabilitated and conserved forest areas: 21,407 rai Forest area for carbon credit evaluation: 1,613 rai 	<p>Supporting activities</p> <ul style="list-style-type: none"> Further increase production efficiency and reduce energy/ water use Promote afforestation and conservation for carbon credit evaluation Reduce waste to landfill Promote community forests and building community capacity

Collaboration and Membership

RATCH has continuously fostered its collaboration with external public and private organizations in organizing activities that support sustainable development.

Collaboration with External Organizations

Organization	Starting year	Project/Activity
RATCH Group Public Company Limited		
In Thailand		
Community Forest Management Office, Royal Forest Department	2007	Love the Forest and the Community Project
Reforestation Promotion Office, Royal Forest Department	2021	Forest conservation project to enhance biodiversity and create carbon sinks under Thailand Greenhouse Gas Management (Public Organization)'s T-VER scheme - Forest and Green area at Khun Song Mountain, Khun Song sub-district, Kaenghangmaew District, Chanthaburi Province, covering 500 rai
Department of Marine and Coastal Resources	2022	Mangrove reforestation for carbon credits, covering 113.47 rai in Bang Chan Sub-district, Khlung District and in Takat Ngao Sub-district, Tha Mai District, Chanthaburi Province
Mae Fah Luang Foundation	2022	Forest Carbon Credits Management for Sustainable Development Project, covering 1,000 rai of community forests
Thai Institute of Directors Association (IOD)	2015	Thailand's Private Sector Collective Action Coalition Against Corruption (CAC)
Stock Exchange of Thailand	2015	SET's Sustainability Assessment for listed companies
Thailand Greenhouse Gas Management Organization (Public Organization)	2016	Certified Carbon Footprint for Organization (CFO) of Ratchaburi Power Plant
	2017	Low Emission Support Scheme (LESS)
	2018	Thailand Voluntary Emission Reduction Program (T-VER)
	2018	Certified CFO of Head Office
	2021	Certified CFO of Nava Nakorn Power Plant

Organization	Starting year	Project/Activity
In Thailand (continued)		
Plant Genetic Conservation Project Under the Royal Initiative of HRH Princess Maha Chakri Sirindhorn	2017	Supporting the initiative through special activities: training on school botanical gardens and local natural resources
Ratchaburi Provincial Energy Office	2018	Community Energy Project
Lao PDR Institute Collaboration		
Ministry of Education and Sports	2011	Education for Career Empowerment Project
Ratchaburi Electricity Generating Company Limited		
In Thailand		
Department of Industrial Works	2012	Standard of Corporate Social Responsibility (CSR-DIW)
Ratchaburi Provincial Labor Protection and Welfare Office	2014	Zero Accident Campaign activity
		Standard on Prevention and Solution to Drug Problems in an Establishment
Labor Safety Center Area 7 (Ratchaburi)	2015	Outstanding workplace on safety, occupational health and work environment
CSR promotion center (Ratchaburi Social Development and Human Security Office)	2017	Support to Ministry of Social Development and Human Security's corporate social responsibility strategy, by establishing the culture of responsibility and strategic administrative unity; promoting the private sector's sustainable development towards SDGs; and promoting CSR activities of international businesses to uplift Thailand's competitiveness in ASEAN and international stages
Center for Morality Promotion (Public Organization)	2017	Role model enterprise on morality in Ratchaburi Province
Ratchaburi Cultural Office	2022	Benefactor of the Ministry of Culture in 2022 fiscal year (Wathanakhunathorn Award)
Damnoen Saduak District, Ratchaburi Province	2022	Our Neighbor Project in Damnoen Saduak Activity: Home fixing for the poor under the Sufficiency Philosophy principles on poverty eradication and development of people at all ages, targeting households in Damnoen Saduak District, Ratchaburi Province, which are not included in Thai People Map and Analytics Platform (TPMAP)
Mental Health Center 5 (Samut Songkhram)	2022	Mental health check in collaboration with Mental Health Center 5 (Samut Songkhram)'s mobile unit

Memberships

Organization	Status	Sustainability dimension	Company's role
RATCH Group Public Company Limited			
Thai Institute of Directors Association (IOD)	Member	Governance	<ul style="list-style-type: none"> Attending training and seminars on corporate governance for directors, executives and employees Supporting academic activities
Thailand Listed Companies Association	Member	Governance	<ul style="list-style-type: none"> Attending meetings and seminars on business management Joining sustainability awards programs
Thai Private Sector Collective Action Against Corruption	Member	Governance	<ul style="list-style-type: none"> Endorsing its manifesto, and being a certified member
Association of the Electricity Supply Industry of East Asia and Western Pacific (AESIEAP)	Member	Economic	<ul style="list-style-type: none"> Exchanging information on regional industry Attending meetings, seminars and study trips on technology in the region
ICC Thailand National Committee	Member	Economic	<ul style="list-style-type: none"> Attending meetings, seminars, training and other activities
Board of Trade			<ul style="list-style-type: none"> Supporting activities
Electricity Supply Industry Association of Thailand	Executive Director	Economic	<ul style="list-style-type: none"> Promoting electricity-related technology and exchanging knowledge and experience on all fields of engineering technology Joining capacity-building activities for professional engineers
Thailand Environment Institute Association of Electrical and Electronic Engineers (IEEE)	Supporter	Economic	<ul style="list-style-type: none"> Supporting academic activities
Thai Industrial Estate and Strategic Partner Association	Member	Economic	<ul style="list-style-type: none"> Promoting and supporting collaboration with the government sector
CIGRE	Member	Economic	<ul style="list-style-type: none"> Supporting academic research and development
Thailand Productivity Institute	Member	Social	<ul style="list-style-type: none"> Joining seminars and study trips
Thailand Carbon Neutral Network (TCNN)	Member	Environmental	<ul style="list-style-type: none"> Promoting public/private/community emission reduction collaboration to achieve Net Zero target

Organization	Status	Sustainability dimension	Company's role
Sustainability Disclosure Community (SDC)	Member	Governance Economic Social Environmental	<ul style="list-style-type: none"> Improving corporate sustainability disclosure Enhancing corporate sustainability in support of SDGs
Thailand Business Council for Sustainable Development and Thailand Environmental Institute	Member	Governance Economic Social Environmental	<ul style="list-style-type: none"> Being a Council member and Associate member Being a partner of its environmental activities concerning PM2.5 and climate change issues
Association of Provident Funds	Member	Governance Social	<ul style="list-style-type: none"> Support the improvement of the association's operational efficiency Joining meetings, trainings and seminars for employees' benefits
Ratchaburi Electricity Generating Company Limited			
Personnel Management Association of Thailand	Member	Economic Social	<ul style="list-style-type: none"> Attending training and seminars on personnel management and labor relations to enhance executives and employees' knowledge
Employers' Confederation of Thai Trade and Industry (ECONTHAI)	Member	Governance Social	<ul style="list-style-type: none"> Attending training and seminars to enhance the knowledge on employment status, labor relations and labor relations laws for an improvement in personnel management and employees' benefits
Federation of Thai Industries	Member	Economic Social	<ul style="list-style-type: none"> Promoting and supporting researches, training and academic reports on industrial technology



Good Corporate Governance



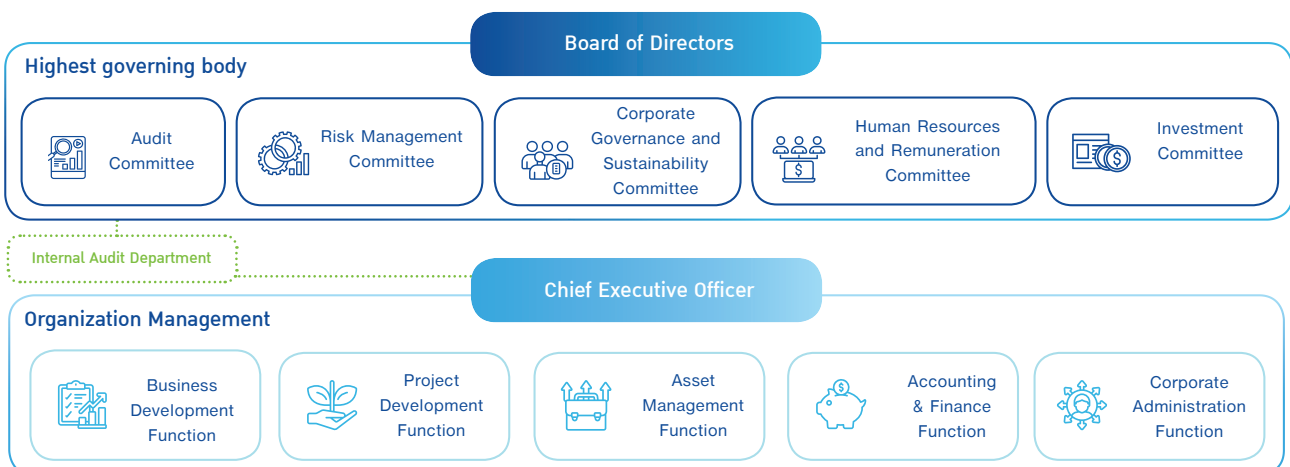
Commitment to good corporate governance

RATCH has established management guidelines in alignment with the principles of Good Corporate Governance of listed companies. The Board of Directors endorsed and announced the Corporate Governance Policy for the Company Group, holding it as the commitment to honor the following practices relating to good corporate governance:

1. Be conscious in the Board of Directors' responsibility as the corporate leader in creating sustainable enterprise values, through the defining of vision, missions and business goals for the 3 sustainability pillars in economic, social and environmental dimensions.
2. Act in line with good governance practices and the Anti-Fraud and Corruption Policy and in full compliance with relevant laws, rules and regulations.
3. Build up an effective board of directors with concerns in the structure, component, qualification, and the selection and nomination process.
4. Ensure an effective and merit-based process in the selection and development of high-level executives and human resource management, for the benefits of the organization, the country and global society.
5. Promote innovations, responsible business operations, and lawful treatment and protection for all stakeholders.
6. Establish an efficient and thorough risk management system, anti-corruption practices and the internal control system that covers finance, operation, supervision, execution and inspection.
7. Maintain financial credit worthiness and ensure accurate, sufficient, transparent and timely information disclosure.
8. Support and promote equitable engagement, treatment and communications with stakeholders.

These practices have been honored through the issuance of regulations, orders and announcements along with responsible units being clearly defined.

Corporate Governing Structure



*In 2022, the Board of Directors approved the Corporate Governance and Social Responsibility Committee's role for sustainability operations that encompassed governance, environmental and social dimensions in line with the corporate strategy; and changed its name to the Corporate Governance and Sustainability Committee. The resolution was effective from 27 December 2022 onwards.



[Read more](#)

The Board of Directors is RATCH's highest governing body, responsible for setting the organization's direction, strategies and growth targets in the short, medium and long term. The Board of Directors plays an important role in leading the organization towards success and sustainable growth.

The guidelines and role of the Board of Directors is shaped accordingly to the company's mission, targets and business context. The guidelines and role are written in the Charter of the Board of Directors which is published on the company's website.

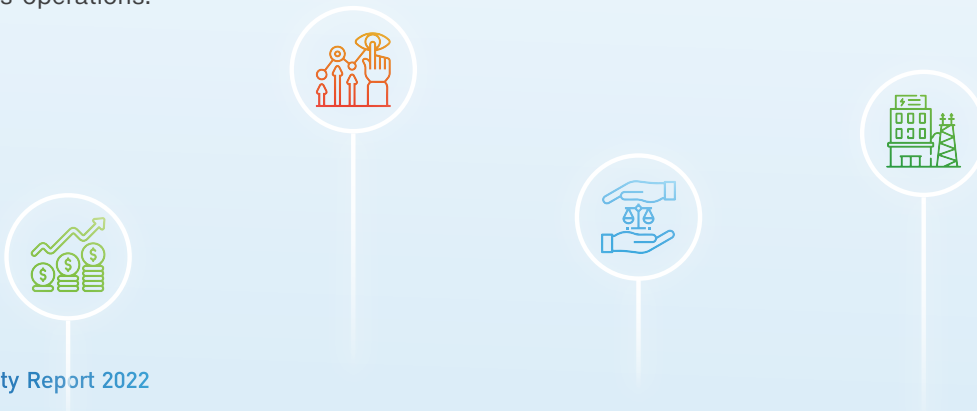
Components of the Board of Directors

Item	Details						
Size of Board of Directors	No. of directors: 12 persons The Board's charter specifies the number of directors of at least 7 and no more than 15. All are appointed at the Annual General Meeting.						
Chairman	One Chairman: Mr. Boonyanit Wongrukmit The Board's Charter specifies the Chairman shall not be an executive director or Chief Executive Officer who is the management chief and shall not have any relationship with the Management. The Chairman shall not serve as Chief Executive Officer to ensure the right balance of power and prevent the unlimited power of either of them. Their duties and responsibilities are clearly separated. The Charter also requires the Board of Directors appoint one of their own, who is neither executive director nor Chief Executive Officer, as the chairman.						
No. of independent directors	6 persons or 50% of director seats: <table border="0"> <tr> <td>1. Mr. Chartchai Rojanaratanangkule</td> <td>4. Mr. Boonsong Kerdklang</td> </tr> <tr> <td>2. Mr. Panuwat Triyangkulsri</td> <td>5. Mr. Kriengkrai Rukkulchon</td> </tr> <tr> <td>3. Mr. Ratanachai Namwong</td> <td>6. Mr. Somboon Nhookeaw</td> </tr> </table> <p>The Board's Charter demands a minimum of one third shall be made up of independent directors or at least three independent directors.</p>	1. Mr. Chartchai Rojanaratanangkule	4. Mr. Boonsong Kerdklang	2. Mr. Panuwat Triyangkulsri	5. Mr. Kriengkrai Rukkulchon	3. Mr. Ratanachai Namwong	6. Mr. Somboon Nhookeaw
1. Mr. Chartchai Rojanaratanangkule	4. Mr. Boonsong Kerdklang						
2. Mr. Panuwat Triyangkulsri	5. Mr. Kriengkrai Rukkulchon						
3. Mr. Ratanachai Namwong	6. Mr. Somboon Nhookeaw						
Sub-committees	5 sub-committees: <ul style="list-style-type: none"> • Audit Committee, with 3 members and Head of Internal Audit Department serving as the Committee's secretary. • Risk Management Committee with 3 members and Head of Corporate Planning and Systems Development Department serving as the Committee's secretary. • Investment Committee with 4 members and Chief Business Development Officer serving as the Committee's secretary. • Human Resources and Remuneration Committee with 3 members and Executive Vice President-Corporate Administration serving as the Committee's secretary. • Corporate Governance and Sustainability Committee with 2 members and Executive Vice President-Corporate Administration serving as the Committee's secretary. 						

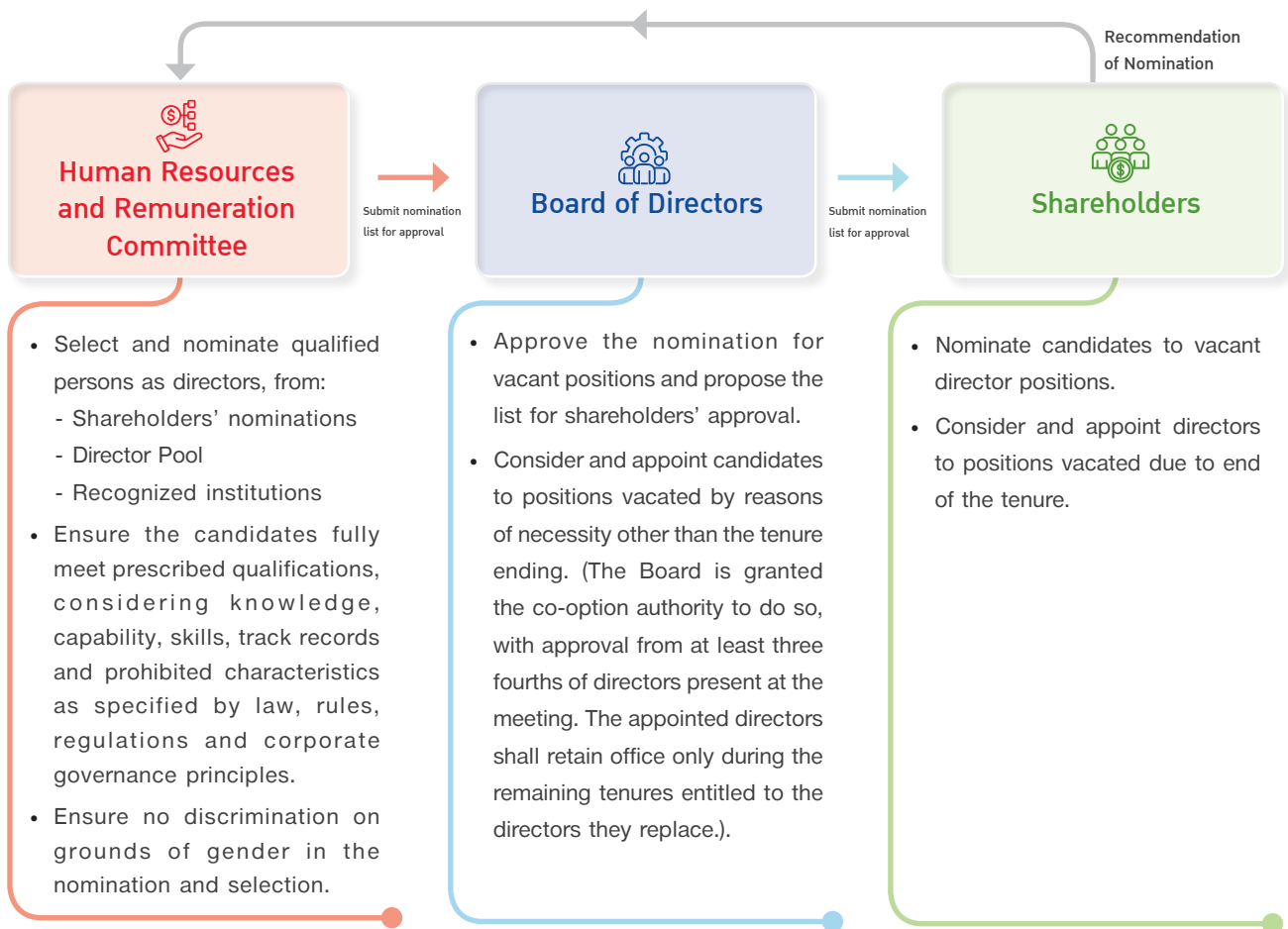
Item	Details
Executive directors	1 person: Miss Choosri Kietkajornkul, Chief Executive Officer The Board's Charter allows executive directors to hold no more than 1/3 of director seats.
No. of directors representing major shareholders	6 persons: 1. Mr. Boonyanit Wongrukmit. 4. Mr. Prasertsak Cherngchawano. 2. Miss Nantika Thangsuphanich. 5. Mr. Kulyos Audomvongseeree. 3. Miss Niramarn Laisathit. 6. Miss Choosri Kietkajornkul.
No. of female directors	3 female directors representing 25% of the total. 1. Miss Nantika Thangsuphanich. 2. Miss Niramarn Laisathit. 3. Miss Choosri Kietkajornkul.
Serving period	Average: 2 years 7 months. - 0-2 years: 7 persons. - 3-4 years: 3 persons. - 5-6 years: 1 persons. The Board's Charter specifies a director from holding the position for more than 6 consecutive years.
Average age	60 years 1 months. The Board's Charter specifies directors must not be aged over 72 years.
Directors who hold positions in other listed companies	3 directors: 1. Mr. Kriengkrai Rukkulchon 1 company 3. Miss Choosri Kietkajornkul 2 companies. 2. Miss Niramarn Laisathit 2 companies.

Selection of directors

RATCH appoints directors on an annual basis under transparent and fair selection criteria and process. Directors' qualifications are clearly defined: nominated directors shall not have prohibited characteristics as specified by law and relevant regulation, the Board of Directors' Charter and corporate governance principles. The company also specifies the ratio of independent directors and diversity of knowledge, capability, experience and expertise in accordance with the company's Board Skills Matrix, to support the company's strategy setting and business operations.



Director nomination process



Director qualifications

Aside from preliminary qualifications specified in the Charter of the Board of Directors, RATCH uses the Competency Matrix to analyze director candidates' competencies and expertise. The matrix looks into two areas:

Core Skills Required

- Knowledge of electricity/energy/infrastructure business.
- Knowledge of accounting and finance.
- Legal knowledge.

Alternative Skills

- Knowledge of financial/banking industry and capital market.
- Academic knowledge or expertise in technology relating to non- power businesses.
- Knowledge of strategic planning.
- Knowledge of corporate governance/ risk management/social responsibility.
- Tax knowledge
- Knowledge of marketing/public relations.
- Being a high-ranking executive of a private company with the same size.
- Work experience in public service.

Expertise of the Board of Directors

No.	Name	Competency, Skill and Experience		
		Experience in power business / industrial sector	Other competency, skill, experience corresponding to business	
1	Mr. Boonyanit Wongrukmit <ul style="list-style-type: none"> Chairman (non-executive director) Chairman of the Investment Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Asset and risk management 	<ul style="list-style-type: none"> Business administration Engineering Corporate governance, CSR, Sustainability Development
2	Mr. Chartchai Rojanaratanangkule <ul style="list-style-type: none"> Independent director (non-executive director) Chairman of the Audit Committee Member of the Corporate Governance and Sustainability Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Business administration Accounting and Finance 	<ul style="list-style-type: none"> Corporate governance, CSR, Sustainability Development
3	Mr. Kriengkrai Rukkulchon <ul style="list-style-type: none"> Independent director (non-executive director) Chairman of the Human Resources and Remuneration Committee 	<ul style="list-style-type: none"> Infrastructure Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Business administration Asset management Engineering 	<ul style="list-style-type: none"> Human resources, compensation Law and regulatory requirement Corporate governance, CSR, Sustainability Development
4	Mr. Panuwat Triyangkulsri <ul style="list-style-type: none"> Independent director (non-executive director) Chairman of the Corporate Governance and Sustainability Committee Member of the Human Resources and Remuneration Committee 	<ul style="list-style-type: none"> Infrastructure Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Business administration Human resources, compensation 	<ul style="list-style-type: none"> IT/Digital/Cybersecurity International trade and relations Corporate governance, CSR, Sustainability Development
5	Miss Nantika Thangsuphanich <ul style="list-style-type: none"> Director (non-executive director) Chairman of the Risk Management Committee Member of the Human Resources and Remuneration Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Planning & strategic management Business administration Human resources, compensation 	<ul style="list-style-type: none"> Risk management IT/Digital/Cybersecurity Corporate governance, CSR, Sustainability Development
6	Mr. Boonsong Kerdklang <ul style="list-style-type: none"> Independent director (non-executive director) Member of the Audit Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Business administration Economics 	<ul style="list-style-type: none"> Corporate governance, CSR, Sustainability Development
7	Mr. Somboon Nhookeaw <ul style="list-style-type: none"> Independent director (non-executive director) Member of the Audit Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Planning & strategic management Business administration Engineering 	<ul style="list-style-type: none"> Accounting, Finance Law, regulatory requirement Corporate governance, CSR, Sustainability Development
8	Miss Niramam Laisathit <ul style="list-style-type: none"> Director (non-executive director) Member of the Investment Committee 	<ul style="list-style-type: none"> Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Business administration Engineering 	<ul style="list-style-type: none"> Accounting, Finance Corporate governance, CSR, Sustainability Development
9	Mr. Prasertsak Cherngchawano <ul style="list-style-type: none"> Director (non-executive director) Member of the Investment Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Business administration Asset management 	<ul style="list-style-type: none"> Engineering Corporate governance, CSR, Sustainability Development
10	Mr. Kulyos Audomvongseree <ul style="list-style-type: none"> Director (non-executive director) Member of the Investment Committee Member of the Risk Management Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Planning & strategic management Business administration Risk management 	<ul style="list-style-type: none"> Engineering Accounting, Finance Corporate governance, CSR, Sustainability Development
11	Mr. Ratanachai Namwong <ul style="list-style-type: none"> Independent director Member of the Risk Management Committee 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise 	<ul style="list-style-type: none"> Planning & strategic management Business administration Asset management 	<ul style="list-style-type: none"> Risk management Engineering Corporate governance, CSR, Sustainability Development
12	Miss Chosri Kietkajornkul <ul style="list-style-type: none"> Director (executive-cum-director) Secretary to the Board of Directors Chief Executive Officer 	<ul style="list-style-type: none"> Power & energy Public sector, State Enterprise Private sector 	<ul style="list-style-type: none"> Planning & strategic management Business administration Asset management 	<ul style="list-style-type: none"> Risk management Accounting, Finance Corporate governance, CSR, Sustainability Development

Board of Directors' role in corporate governance

The Board of Directors is obligated to ensure the company's compliance with laws, business objectives and targets. It shall perform duties with integrity, have no conflict of interest and safeguard the interests of the organization, shareholders and relevant stakeholders. The Board of Directors' duties and responsibilities cover the following aspects:

1.

Formulate strategies, business plans and budgets to support the company's solid and sustainable growth.

2.

Delegate power to Chief Executive Officer for the execution of business plans as approved by the Board of Directors for operational flexibility and timely decisions

3.

Follow up on the execution of business strategies and work plans, the management of risks that may derail targets or strategic achievements, and the progress as benchmarked against ESG targets on a quarterly basis; as well as give recommendations and tackle possible problems

4.

Set the vision and strategy on human resources management, emphasizing the executive development plan, the performance-based remuneration strategy and the plan to attract and retain talents; and ensure fair and transparent criteria and approach for the nomination, dismissal and termination of directors and high-level executives as well as the performance-based evaluation process for top executives

5.

Ensure the completeness and compliance with corporate governance principles, entailing the provisions of:

- Business ethics and guidelines for executives and employees as well as communications on Code of Conduct to employees at all levels
- Accurate, complete and quality financial reports
- Respect to and strict and full compliance with relevant laws
- Efficient internal control process
- Qualifications and evaluation of the auditor
- Efficient risk assessment/management system and process
- Transparent process for related-party transactions
- Appropriate balance of power between the Board and the Management and/or major shareholders through the setting of independent director proportion
- Sufficient information to sub-committees for efficient supervision and monitoring of the Management
- Systematic and efficient document management system for the Board of Directors meeting
- Monitoring of conflicts of interest, particularly concerning fraud and corruption prevention
- Process to protect and strengthen corporate reputation

6.

Communicate with stakeholders through appropriate forms and channels

7.

Establishment and specification of sub-committees' roles and duties, for assistance in supervising and monitoring significant issues

8.

Annual evaluation of the Board of Directors and sub-committees' performance under specified criteria and method, having the results published in the Annual Report

Corporate governance performance in 2022

Item	Detail
Meeting	<ol style="list-style-type: none"> Board of Directors: 14 meetings Sub-committees: <ul style="list-style-type: none"> Audit Committee: 6 meetings Risk Management Committee: 8 meetings Investment Committee: 8 meetings Human Resources and Remuneration Committee: 9 meetings Corporate Governance and Sustainability Committee: 4 meetings Co-Meeting of Audit Committee and Risk Management: 1 meeting The Board of Directors Meeting without executive director: 1 meeting <p>The Board's charter requires the Board of Directors convene at least once a month and the meeting of directors without the Management's presence be held at least once a year. At least half of the directors must attend the meeting to form a quorum.</p>
Average meeting attendance	<p>The Board of Directors: 100%</p> <p>Sub-committees:</p> <ul style="list-style-type: none"> Audit Committee: 100% Risk Management Committee: 100% Investment Committee: 100% Human Resources and Remuneration Committee: 100% Corporate Governance and Social Responsibility Committee: 100%
Directors appointed in 2022	<ul style="list-style-type: none"> No. of new directors appointed in 2022: 2 persons No. of directors reappointed in 2022: 3 persons

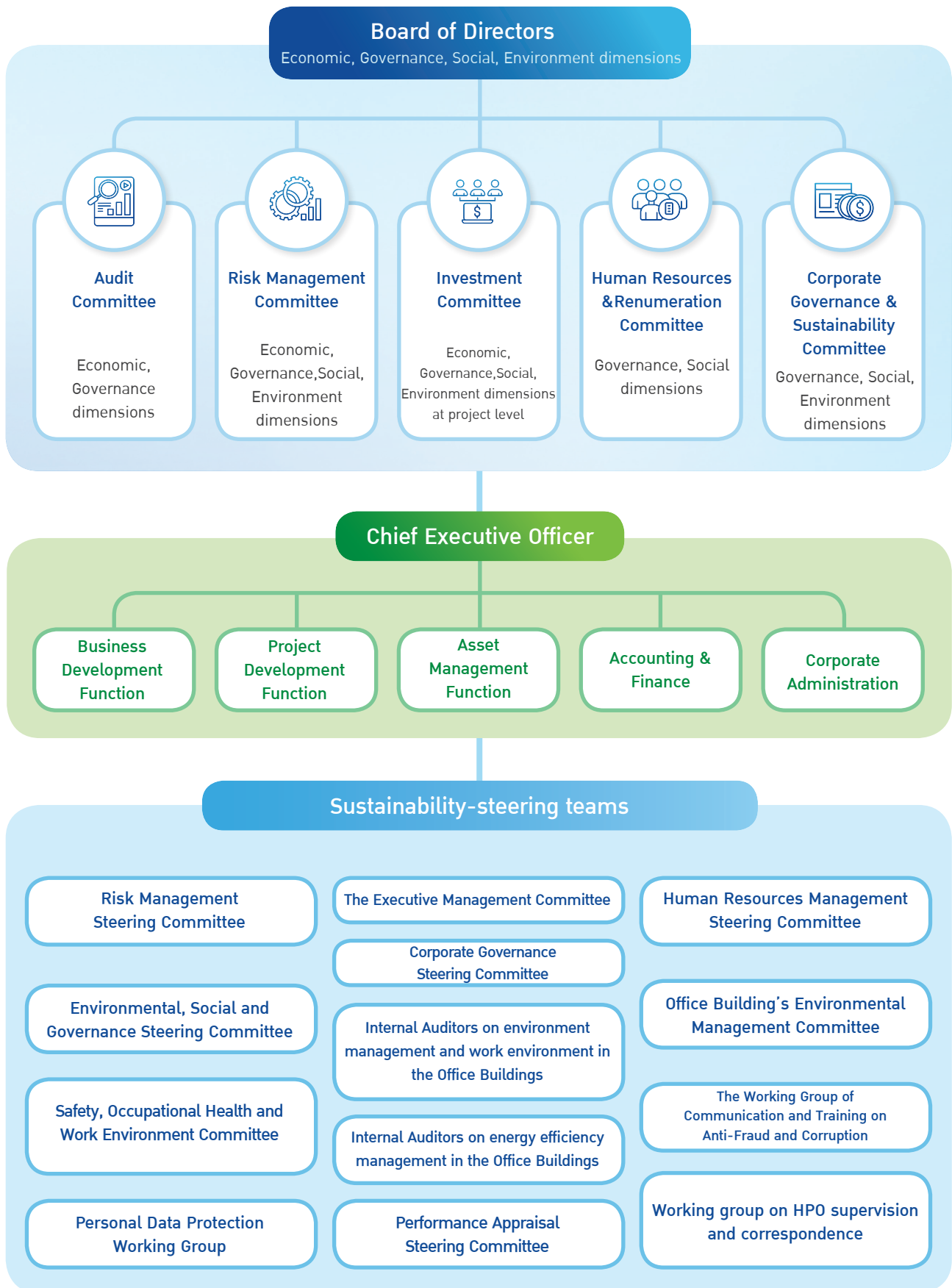


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Supervision on sustainability

The Board of Directors has placed a greater emphasis on sustainability operations. In 2022, it approved an extension in the Corporate Governance and Social Responsibility Committee's responsibility to cover sustainability operations and changed the name to the Corporate Governance and Sustainability Committee. The Board of Directors also endorsed the sustainability strategy and targets, to drive, supervise and monitor the company's sustainability operations towards the targets.

All units, from the Board of Directors to sub-committees, the Management and a special working teams, have taken part in the operations and steered the company towards sustainability targets. All involved in ensuring compliance with the strategy, so as to improve the operations in economic, governance, social and environmental dimensions in alignment with legislation, sustainability principles, international standards and stakeholders' expectations; and eventually achieve sustainability targets.



Under the structure, the Corporate Governance and Sustainability Committee will play a principal role in supervising and monitoring progress on the sustainability strategy and target achievement. The Corporate Administration Function will assist in steering sustainability actions, through collaboration with other functions, steering committee and working groups of the company, subsidiaries and joint ventures.

Key sustainability performance in 2022



Reviewed and improved the Corporate Governance and Social Responsibility Committee's roles and duties, resulting in the extension of its supervision to cover governance and sustainability operations in environment, social and governance dimension (ESG) which is of increasing importance and a major component of the organization's drive towards strategic targets and creation of long-term shared values for stakeholders. The committee was renamed to the Corporate Governance and Sustainability Committee.

Reviewed and improved the company's CG Code in alignment with Thai Institute of Directors' Corporate Governance Report of Thai Listed Companies (CGR) criteria, which will be effective in 2023. The assessment criteria cover 4 categories: 1) Rights of Shareholders and Equitable Treatment of Shareholders 2) Role of Stakeholders and Sustainability Operations 3) Disclosure and Transparency and 4) Board Responsibilities.



Amended the Prevention of Misuse of Inside Information Policy in line with the amendment in the CG Code's Section 1: Rights of Shareholders and Equitable Treatment of Shareholders. The amendment requires directors and high-level executives to inform the Board of Directors about their trading in the company's securities and submit the intention form at least 1 day prior to the transaction date.



Established Supplier Code of Conduct in alignment with legislation, the company's Code of Conduct and internationally-recognized standards/best practices on Environmental, Social and Governance. The Supplier Code of Conduct was announced on 20 June 2022 and will be imposed on suppliers from 2023 onwards.



[Read more](#)



Established the Human Rights Policy to reflect respect to basic human rights and the human dignity of all individuals working for the company. The policy is aligned with domestic legislation and international human rights principles. It was officially effective on 30 June 2022.

- Achieved full Human Right Due Diligence in the company, subsidiaries and joint ventures (100%) for the preparation of Human Rights Risk Register.



[Read more](#)

Established Sustainability Strategy and targets in 2030, encompassing topics that influence the company's operations and supports the following 3 sustainability pillars:

 <p>Economic</p> <ul style="list-style-type: none"> • Customer relationships management • Sustainable supply chain management 	 <p>Society</p> <ul style="list-style-type: none"> • Community engagement • Respect for human rights 	 <p>Environment</p> <ul style="list-style-type: none"> • Climate change
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Devised Climate Strategy, greenhouse gas emission reduction approach, and carbon neutrality target in line with the company's business strategy and stakeholders' expectations for appropriate shared values for all.

- Promoted the corporate culture in the areas of governance, ethics and integrity for all business activities
- Raised awareness in compliance with the Code of Conduct and the Anti-Fraud and Corruption Policy: in 2022, all executives and employees (100%) participated in the training on the Code of Conduct and the Anti-Fraud and Corruption Policy and post-training evaluation showed their knowledge and understanding met the company's criteria (80% of full score).
- Established the Personal Data Protection Policy and the personal data control system via One Trust system for the management of personal data/consent/violation/ Data Subject Rights Request Form; appointed the Data Protection Officer (DPO) to ensure personal data security in pursuant to the Personal Data Protection Act B.E.2562.
- In 2022, the company reported zero violation to the Code of Conduct and zero complaint.



Performance assessment of Board of Directors

RATCH demands an annual performance assessment on the Board of Directors and sub-committees, on the “as a whole” and “individual” basis. The assessment criteria are as follows:

Assessment criteria of the Board

- Board qualifications (Structure; components; independence; roles, duties and responsibilities; and development)
- Formulation of strategy, business plan and budgets
- Division of roles, duties and responsibilities and delegation of power
- Supervision and monitoring
- Human resources management
- Management of risks, internal control and conflicts of interest
- Communications with stakeholders and the general public
- Board meeting

Assessment criteria of the Sub-committees

- Sub-committee qualifications (Structure; components; independence; roles, duties and responsibilities; and development)
- Sub-committee meeting
- Sub-committees’ roles, duties and responsibilities



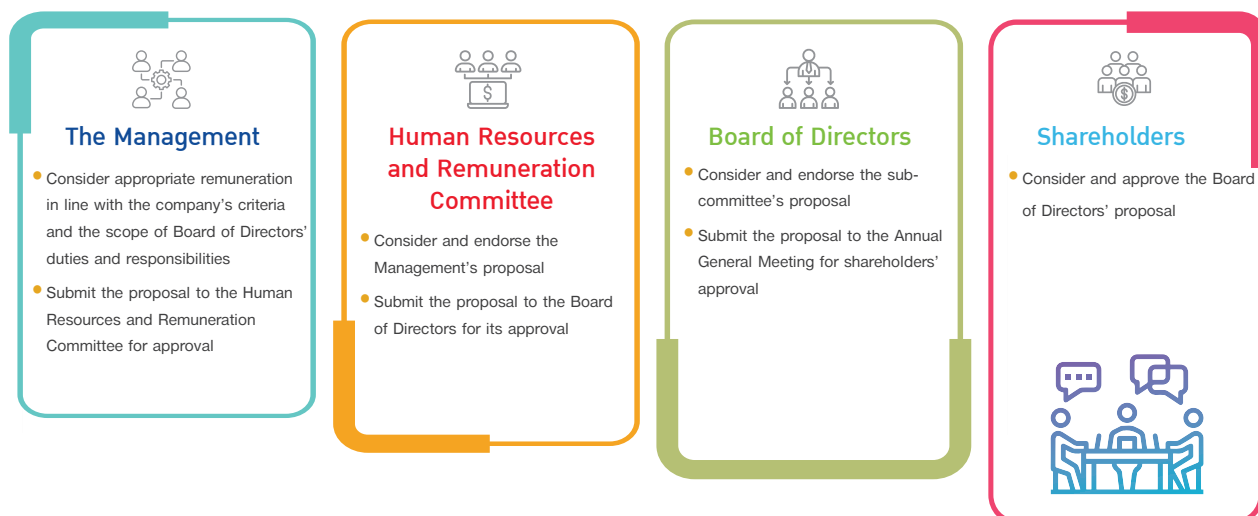
Performance	As a whole		Individual basis	
	Score (Full score: 100 points)		Score (Full score: 60 points)	
	2022	2021	2022	2021
Board of Directors	97.91	96.83	58.75	58.41

	Score (Full score: 80 points)		Score (Full score: 40 points)	
Audit Committee	79.33	78.33	39.00	39.00
Risk Management Committee	79.33	79.33	40.00	40.00
Investment Committee	77.25	78.33	39.00	39.66
Human Resources and Remuneration Committee	78.67	79.33	39.33	40.00
Corporate Governance and Sustainability Committee	79.00	78.50	39.50	39.50

Directors' remuneration

RATCH clearly outlined the policy and criteria on directors' remuneration in writing, detailing appropriate, transparent and verifiable criteria and method in line with current conditions and for the company's best interests. The remuneration is set in alignment with the Company Group's targets and performance.

Director remuneration-setting process



Guideline on remuneration setting

Fixed remuneration	<ul style="list-style-type: none"> Board of Directors: The retainer for the company's Board of Directors is paid on a monthly basis. The first 75% of the retainer is fixed while the remaining 25% is paid when the directors attend meetings. The Chairman of the Board's retainer is 25% higher than the sum paid to other directors. Sub-committees: The retainer is paid when a committee member attends a sub-committee meeting. The sub-committee chairman's retainer is 25% higher than the sum paid to other directors.
Bonus	Bonus is allocated accordingly to the period of service and attendance to the Board of Directors meetings. When a director holds directorship in more than 1 company in the Group, the director shall be paid by a company that offers a higher bonus for the period. The Chairman of the Board's bonus is 25 percent higher than the sum paid to other directors.
Other forms of benefits	Directors received no other benefits, cash or non-cash.

Summary of directors' remuneration in 2022

Directors' remuneration	<p>Total: Baht 26,951,008.06 million (11 non-executive directors)</p> <p>Sub-committees :</p> <ul style="list-style-type: none"> Audit Committee: Baht 682,500 (3 persons) Risk Management Committee: Baht 847,500 (3 persons) Investment Committee: Baht 960,000 (4 persons) Human Resources and Remuneration Committee: Baht 877,500 (3 persons) Corporate Governance and Sustainability Committee: Baht 270,000 (2 persons)
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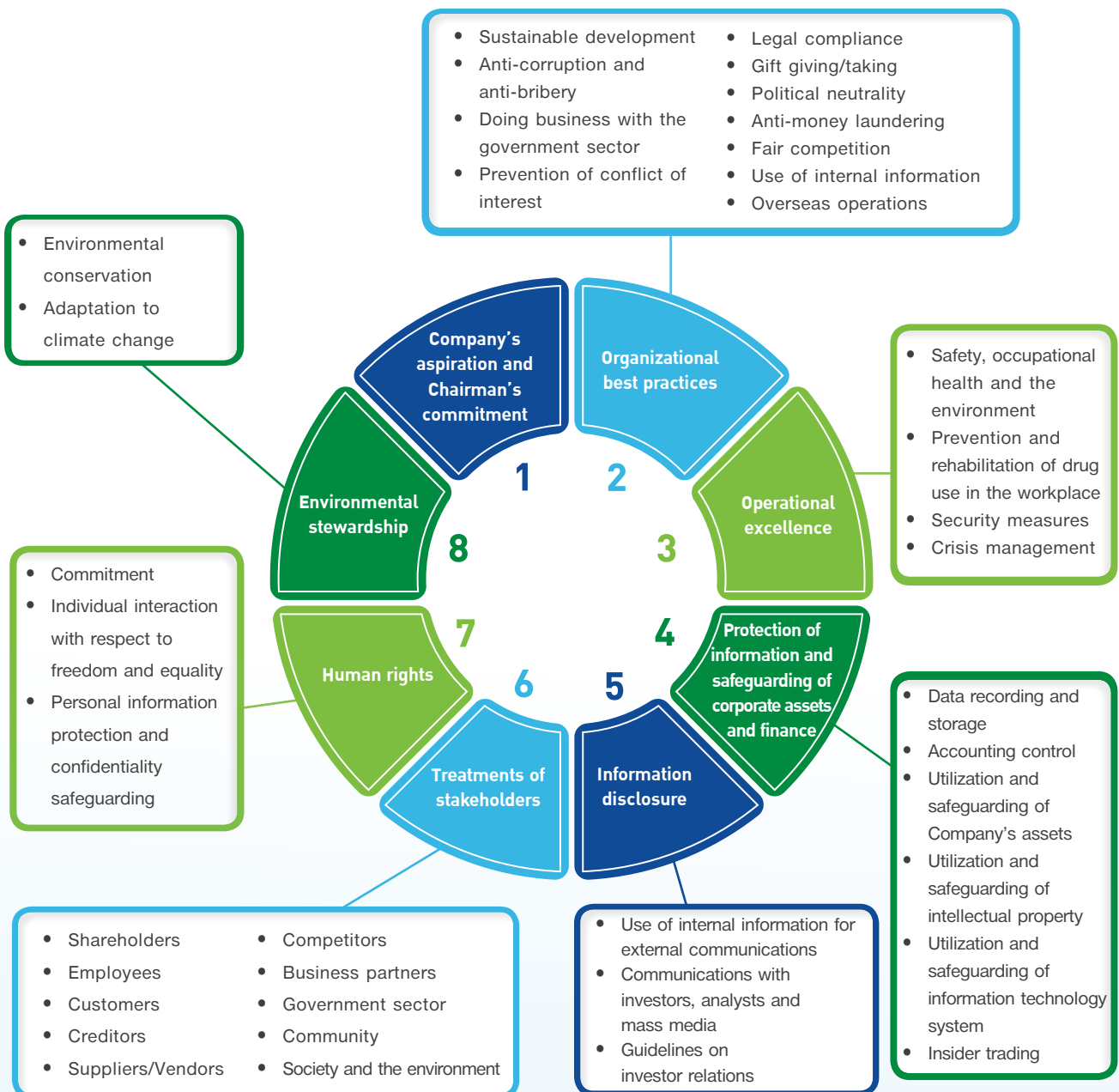


Business Aspiration

“ RATCH believes doing business on the foundation of integrity, ethics and morality with concerns about fair and equitable treatment of stakeholders and supports to economic, social and environment development will raise the organization’s values and lead it towards solid and sustainable growth. ”

RATCH’s Code of Conduct outlined operational guidelines in alignment with the company’s rules and regulations. All executives and employees as well as relevant individuals are held responsible to study and strictly follow the Code of Conduct.

Element of Code of Conduct



Compliance with Code of Conduct and supervision



Individuals held responsible to follow Code of Conduct

1

Executives and employees

2

Operating controlled subsidiaries

3

Non-operating controlled subsidiaries, demanded to acknowledge the Code and streamline their practices

4

Outsourced acting on behalf of company



Compliance supervision

1. Spread awareness and understanding in the Code of Conduct via training, notifications and orientation.
2. Require supervisors at all levels to constantly monitor subordinates' compliance with the Code of Conduct.
3. Establish whistleblowing channel for complaints on possible breach of the Code of Conduct.
4. Set penalties for the breach of the Code of Conduct.
5. Devise measures to prevent retaliation and remediate complainant.
6. Establish a procedure on compliance reporting to the Board of Directors.



Whistleblowing channels



Corporate website

<https://www.ratch.co.th/anti-corruption-whistle-blowing/whistleblowing-channel>



Postal

(Addressed to recipient)
RATCH GROUP PCL.
72 Ngam Wong Wan Rd.,
Bangkhen, Muang Nonthaburi,
Nonthaburi, 11000

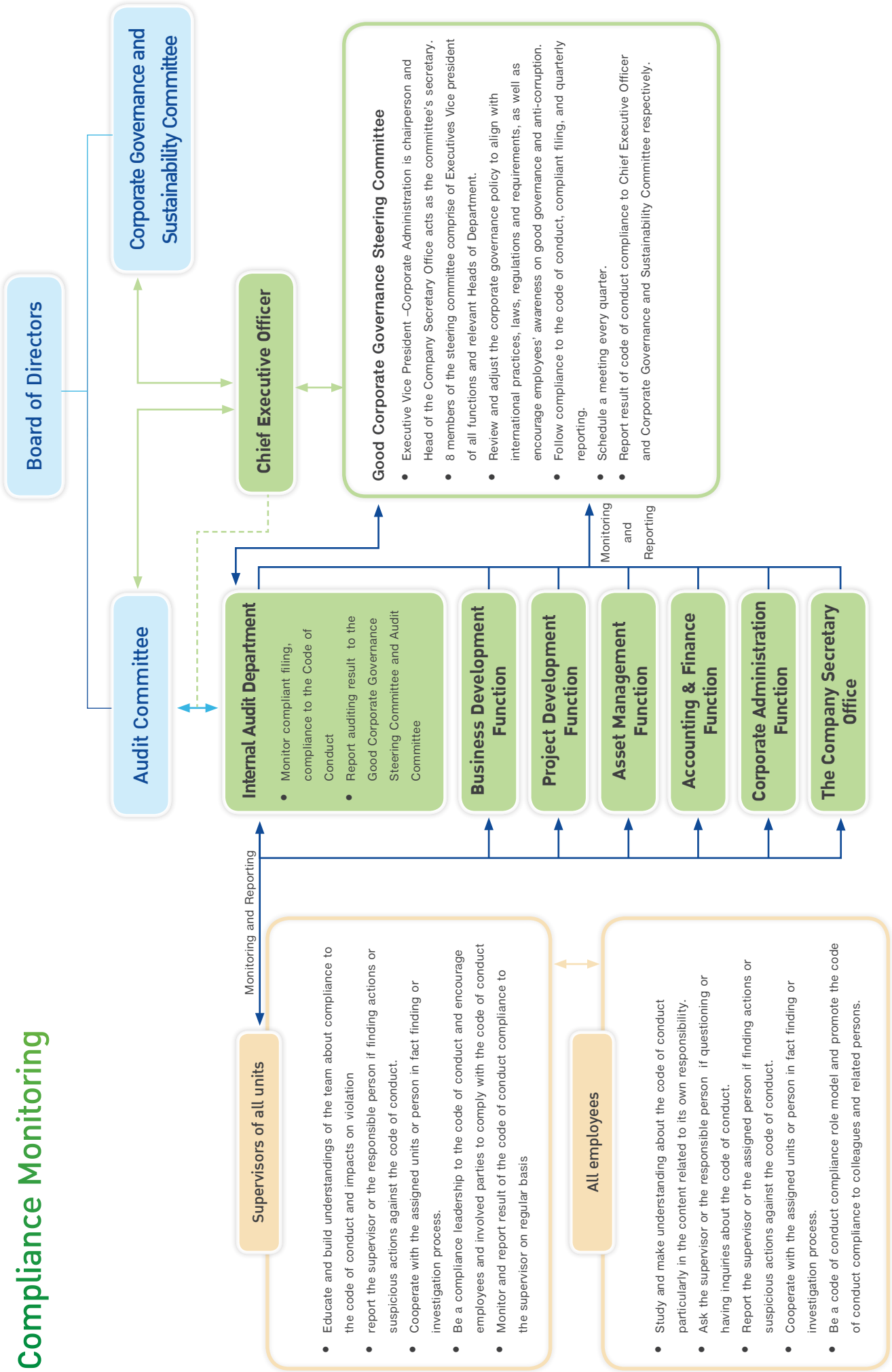


e-mail

1. Chairman and directors
directors@ratch.co.th
2. Independent directors
id@ratch.co.th
3. Audit Committee
ac@ratch.co.th
4. Chief Executive Officer
ceo@ratch.co.th
5. Head of Internal Audit Division
internalaudit@ratch.co.th
6. Supervisors
(for employees only)



Compliance Monitoring



Performance on Compliance Promotion and Complaints in 2022

In 2022, RATCH implemented a program to promote compliance with the Code of Conduct, aside from the orientation where new recruits are informed of and acknowledge the Code. Processes were developed to inform employees about the Code of Conduct and to evaluate the compliance: they are integrated into the initiative that drives awareness in fraud and corruption and are a part of the annual performance evaluation process.

Compliance Promotion Approach	Evaluation results
Orientation on the Code of Conduct for new hired employees.	All 16 new employees recruited in 2022 (100%) attended the orientation and signed their acknowledgement to the Code of Conduct.
Whistleblowing reports through supervisors.	None
Whistleblowing reports on violation through corporate website.	None
Training and test on knowledge and understanding in compliance to the Code of Conduct and the anti-fraud and corruption policy involving executives and employees through MY HR system.	<ul style="list-style-type: none"> All executives and employees (100%) learnt about the code of conduct via e-learning system All participants (100%) passed the test with scores above the 80% required level.

Legal compliance

Legal compliance is a best practice included in the Code of Conduct, demanding:

- All business units to comply with the laws in particular countries and relevant international laws.
- All individual executives and employees to uphold and seriously respect and compliance with relevant laws and regulations.
- All individual executives and employees to acknowledge and comply with the laws and regulations that are enforced or concern their responsibilities.
- All individual executives and employees to be honest in cooperating with and treating compliance officers.
- Integration of rules and regulations that influence the company's operations into strategic plans and business processes.
- Establishment of a team specialized in relevant regulations or a unit for coordination with government offices as well as the management of regulatory risks.
- Executives and employees to constantly monitor legal and regulatory changes.

Promotion on Free and Fair Trade Competition

The company stipulated a guideline concerning free and fair trade competition in the code of conduct as follows;

- 1) All executives and employees must study and gain understanding about competition and antitrust laws before any action is taken and must study and examine the laws relating to monopoly before proceeding to acquire and merge business or other related transactions that may reduce or significantly limit free competition in the market.
- 2) All executives and employees must comply with laws relating to trade competition in the countries in which the Company operates its business and do not show anti-competitive behavior including do not form an agreement with characteristic that may reduce or limit trade competition or cause unfair competition with competitors or any person. Such characteristic includes pricing, fraudulent bidding, marketing allocation, and agreement to restrict procurement. Be careful about meeting or contacting competitors or do not participate in any agreements that may be deemed a conspiracy on anti-competitive trade.
- 3) Do not exchange important information that affects trade competition with third parties, especially competitors and do not accept direct and indirect information from competitors and do not exchange or receive illegal information.
- 4) Carefully participate in business and trade association activities to avoid exchanging information with competitors.
- 5) Approval from senior executives must be granted before any information about the Company's trade secret can be given or exchanged with business partners or joint ventures.

RATCH has established the Legal Department and Compliance Division to review and comply with legal requirements and regulations relevant to the Company's operations. Other units are established to deal with labor issues, welfare, the environment, safety and occupational health, licences, contract management, tax management, etc. All the units are tasked to ensure full compliance with laws and regulations and constantly monitor latest changes in the legal landscape.

Performance in 2022

Activity	Performance
1. Legal compliance	<ul style="list-style-type: none"> • RATCH and business units under operational control were in full compliance with relevant laws including fair trade competition. • Compliance risks concerning investment in Thailand and abroad were assessed. The assessment required the study in legislation, regulations, criteria and regulations as well as the norms, traditions and cultures of particular countries through specialized and experienced legal advisors. The process also covered the exploration of opportunities to forge investment with experienced and specialized local partners, to reduce risks and impacts.
2. Law training for employees	<p>One training was organized, involving relevant units and their staff. The training focused on the key issues of the Personal Data Protection Act B.E. 2562, essential for the making of a work plan and update of legal document as well as work guidelines for compliance.</p>

Activity	Performance
<p>3. E-Newsletter to promote knowledge on the laws relevant to the operations as well as legal updates, for distribution to employees via e-mail</p>	<p>Quarterly E-Newsletters were issued, containing the following matters:</p> <ul style="list-style-type: none"> • Department of Provincial Administration’s announcement on scrapping of ID card and house registration copies. • Energy Regulatory Commission’s regulation on criteria, methods and conditions in considering power plant site and surrounding environment for the licensing process B.E. 2564. • Office of the Personal Data Protection Committee’s announcement on security measures of personal data controllers B.E. 2565. • Office of the Personal Data Protection Committee’s regulation on complaint filing, rejection, termination and consideration B.E. 2565 . • Ministerial regulation on abolition of factories’ annual fees B.E. 2565 .
<p>4. Reporting of amendments in legislation and notifications on SET-listed companies’ practices as well as compliance of the Company’s rules and regulations with the said changes to the Corporate Governance and Sustainability commission</p>	<p>The reports were completed on a quarterly basis, concerning the following changes:</p> <ul style="list-style-type: none"> • Capital Market Supervisory Board’s Notification No. Tor Jor. 78/2564 on criteria for proposing agenda of the Annual General Meeting by shareholders as well as good corporate governance practices relating to the proposal submission under Securities and Exchange Act B.E.2535’s Section 89/28 • Capital Market Supervisory Board’s Notification No. Tor Jor. 79/2564 on criteria on the general solicitation Relating to the appointment of proxy by the shareholders to attend and vote in the Annual General Meeting • Amendment to Public Limited Companies Act B.E.2535 for alignment with Public Limited Companies Act (No.4) B.E.2565

Political Neutrality Commitment

The company’s code of conduct set business practices regarding to political neutrality as following below;

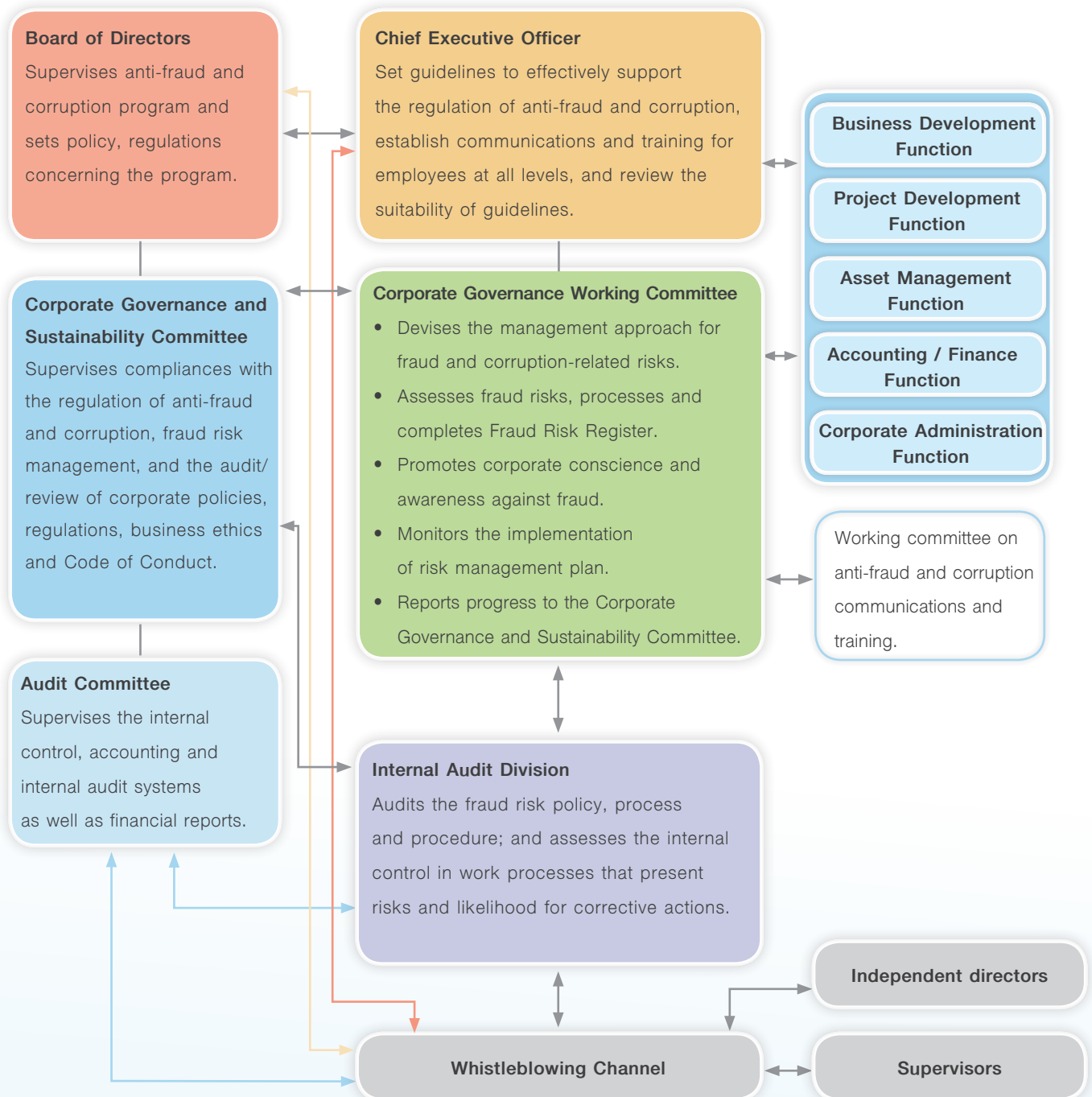
- 1) The Company will be politically neutral by not taking any actions that take sides or support any political parties or any persons with political power, including not participating in activities of any political parties or groups or politicians whether directly or indirectly, and not allowing political parties to use the resources and location of the Company for political activities.
- 2) The Company respects the right and freedom of employees to exercise their political rights such as voting in an election or being a member of a political party, as well as the personal rights of employees to participate in the political activities outside of working hours as appropriate under the conditions that such actions do not represent of the Company and use the employees’ own resources.

The company has no involvement with any public policy and no any forms of political contribution.

Prevention of fraud, corruption and conflict of interest



Anti-fraud and corruption supervision structure



The Board of Directors is determined to achieve fair and transparent operations in alignment with governance best practices and business ethics as well as fair and equitable treatments of stakeholders and society, aside from the commitment to fight all forms of frauds and corruption. The Board of Directors clearly outlined the principles and guidelines in preventing fraud and corruption risks that shall be honored by all directors, executives and job operators of the Company, controlled subsidiaries and business partners acting on behalf of the Company.

In 2014, RATCH declared its intent in the “Thai Private Sector Collective Action Coalition Against Corruption Project” and has been a certified member of the Thai Private Sector Collective Action Against Corruption (CAC) since 2018.

Key Principles in Fraud and Corruption Prevention

RATCH's key principles concern the following 4 areas:

1. RATCH will not involve with giving or taking bribes and all forms of fraud and corruption, in doing business with private companies or the public sector.
2. RATCH will be politically neutral by not taking any action that takes sides or supports any political party or any person with political power; participating in activities of any political party or group or politician, directly or indirectly; or allowing political parties to use the resources and premises for political activities. Nevertheless, the Company respects employees' political right and freedom in expressing their opinions and participating in political activities, as stipulated in the Constitution and relevant laws and regulations.
3. Charitable donations and sponsorships shall be transparent and for charitable causes, in line with the Company's regulation.
4. Gift and souvenir giving/taking shall be done for an appropriate business purpose. It shall not have any significant impact on the decision-making of the Board of Directors, the Management, employees or third parties or done for an exchange of special business arrangements or items valued above the Company's permissible limit. All shall refrain from offering or giving gifts or valuable items to government officers or private company officers for an inappropriate business advantage.
5. Giving receptions and other benefits shall be transparent and not for an exchange of benefits or anything in return. It shall not have any significant impact on the decision-making of the Board of Directors, the Management, employees or third parties or take place for an exchange of special business arrangements or anything deemed a corruption, which raises doubts on the integrity of the Company's representatives and causes negative impacts on the Company's reputation. Receptions and other benefits shall not be offered or taken through business interactions with government or private parties for an inappropriate business advantage.

Any act in violation against the Regulation of Anti-Fraud and Corruption is subjected to prescribed disciplinary actions that include the termination of employment, if necessary. Violators may also be liable to legal punishments if their act is proved illegal.

Performance On Anti-Fraud and Corruption Actions

RATCH's anti-fraud and corruption actions are supervised by the Corporate Governance and Sustainability Committee, with the Corporate Governance Working Committee tasked to monitor compliance with the Regulation of Anti-Fraud and Corruption, review the fraud risk management and to raise employees' awareness against frauds and corruption. The key points achieved in 2022 are as follows:



The review on Fraud Risk Register showed that the register completely and sufficiently covered significant risks and needed no improvement. RATCH thus decided to use the existing register. It instead emphasized communication and training to continuously raise knowledge, understanding and awareness and pave way for the organization's integrity culture which will shape a significant protective measure and keep risks at an acceptable level.



Communications to enhance knowledge and awareness in fraud and corruption prevention through internal channels were done through quarterly E-Newsletters directly sent to employees' e-mail addresses, covering:

- RATCH's 2nd membership recertification from the Thai Private Sector Collective Action Against Corruption.
- Internal control measures to prevent frauds and corruption.
- Complaint, whistleblowing, measures to prevent retaliation and mitigate damage and complaint and whistleblowing channels.
- Certificate presentation at CAC Certification Ceremony 2022.



Anti-fraud and corruption training for employees under the "Enhancement of corporate morality and transparency to sustainably fight against frauds and corruption" title, to ensure their understanding in the Company's policy, as a member of the Thai Private Sector Collective Action Against Corruption. With speakers from TRIS Academy, the training was participated by 103 attendees, representing the Company's Group.

Post-training evaluation result:

Assessment points	% of respondents	Level
Post-training knowledge and understanding	58.2	Very high
	40.3	High
	1.5	Medium
Application of knowledge with their routines	59.7	Very high
	40.3	High

Training for new employees on the Company's governance and anti-fraud and corruption guidelines, to ensure their understanding in policies, orders and rules relating to governance and anti-fraud and corruption.



RATCH was bestowed the CAC certificate at "CAC Certification Ceremony 2022" from Thai Institute of Directors. With the certificate, RATCH's membership to the Thai Private Sector Collective Action Against Corruption was recertified for the 2nd time. The certification period is 3 years from the approval date, or from 31 March 2022 through 31 March 2025. The certificate reflects RATCH's determination to establish an effective internal control system, as a mechanism to prevent and fight against fraud and corruption.

Conflict of interest

RATCH outlines the principles and guidelines on the handling and prevention of conflict of interest, taking into consideration relevant laws and regulations, governance best practices and generally-accepted standards and holds the Board of Directors, the Management, employees and relevant individuals responsible for the implementation. The principles and key guidelines appear in the Code of Conduct, the Regulation of the Board of Directors and related policies. The highlights are summarized below:

Guidelines for the prevention of conflict of interest



1. Code of Conduct

- Business decisions must be in the Company's best interest, not personal interest.
- All individual executives and employees shall perform their duties at their full ability and ensure business decisions are in the Company's best interest and conform with laws and ethics.
- Executives and employees shall act transparently and their actions must not send impacts or cause damage on the Company's reputation and creditability.
- Do not wrongly use the Company's resources or name or cause damage to the organization's reputation and image, intentionally or unintentionally, with full knowledge of negative consequences.
- Executives and employees shall not operate a business in direct competition with the Company or shall not operate any business in the same nature to the Company's business,
- Executives and employees shall not hold a position in an external organization or a non-profit organization unless they inform or receive approval accordingly to relevant rules. They shall disclose their interests in the Company and in business ventures related to the Company and do business with the Company.
- Do not use the Company's resources, intellectual property, work time or company premises for personal gains.
- Avoid activities that may affect their responsibility or cause conflict of interest with the Company. In case of involvement with business or event that may cause conflict of interest, they must immediately inform the supervisors.
- Executives and employees shall not seek personal gains from the information obtained in relation to their positions.
- The Management shall review conflicts of interest concerning related-party transactions between the Company with subsidiaries, affiliated companies or parties with controlling interests thoroughly, honestly, reasonably and independently, to ensure the transactions meet ethical standards and trade conditions applicable to other suppliers and are executed in the Company's best interest.
- An individual with vested interests in specific agenda being discussed at a meeting shall leave the meeting room temporarily, so that others can review, analyse and criticize the matter without the person's influence.
- All executives shall disclose their interests and related individuals' in the prescribed form and send the form to the responsible unit within specified time. Such reports shall be updated in case of changes in the interests.
- Recruiting a person related the Management and employees shall be transparent and fair to others with same qualifications.



2. Regulations of the Board of Directors

2.1 Qualifications of independent directors

- Neither being nor having been an executive director, employee, staff or monthly-paid advisor, or a controlling person of the Company, its subsidiary, affiliate, joint venture, same-level subsidiary or juristic person who may have conflicts of interest unless the foregoing status has ended not less than two years prior to the date of appointment as an independent director
- Not having a business relationship with the Company, its subsidiary, affiliate, joint venture, or juristic person who may have conflicts of interest, in the manner which may interfere with his independent judgement, and neither being nor having a major shareholder, non-independent director or executive of any person having business relationship with the Company, its subsidiary, affiliate, joint venture or juristic person who may have conflicts of interest unless the foregoing status has ended not less than two years prior to the date of appointment as an independent director. The term “business relationship” includes any normal business transaction, rental or lease of immovable property or extending loans, guarantee, providing assets as collateral, including any other similar actions, which bind the Company or contractual party to indebtedness payable to the other party in the amount of 3 percent or more of the Company’s net tangible assets or 20 million baht or more, whichever is lower.
- Neither being nor having been an auditor of the Company, its subsidiary, affiliate, joint venture or juristic person who may have conflicts of interest, and not being a major shareholder, non-independent director, executive or partner of an audit firm which employs the auditors of the Company, its subsidiary, affiliate, joint venture or juristic person who may have conflicts of interest unless the foregoing relationship has ended not less than two years prior to the date of appointment as an independent director.
- Neither being nor having been any professional advisor including legal advisor or financial advisor who receives an annual service fee exceeding two million baht from the Company, its subsidiary, affiliate, joint venture or juristic person who may have conflicts of interest. If the professional advisor is a juristic person, the definition is extended to the firm’s major shareholders, non-independent directors, executives or partners unless the foregoing relationship has ended not less than two years prior to the date of appointment as an independent director.
- Not being a director appointed to represent the Company’s directors, major shareholders or other shareholders related to the major shareholders.

2.2 Component of the Board of Directors

- At least one third of directors or at least 3 directors must be independent directors.
- The Chairman must be a non-executive member and not the same person as the Chief Executive Officer.
- Directors shall not hold positions in more than 3 listed companies.

2.3 Director voting: Directors with vested interests in specific agenda item shall not have the voting right on the agenda. In case the number of votes is equal, the chairman of the meeting shall make the casting vote.



3. Regulation of the Audit Committee

holding the committee to:

- Review related transactions or transactions that may have conflict of interest based on laws and the SET’s rules and regulations, to make sure the transactions are appropriate and in the Company’s best interest.
- Give opinions on transaction with possible conflict of interest, related transactions and connected transactions for inclusion in annual reports.
- Report the transactions that may have significant impacts on the Company’s financial status or operational performance to the Board of Directors for corrective measures.



4. Regulation of Human Resources Management

prohibiting employees from doing business that competes with the Company or causes conflict of interest and requiring them to strictly safeguard the confidentiality concerning their assignments or the Company's top secrets. Disclosure that causes the Company severe damage shall be regarded as cause for severe disciplinary action.



5. Inside Information Policy

- Directors, executives and employees obtaining the Company's inside information shall not disclose or pass the information, directly or indirectly by whatever means, to outsiders or all irrelevant persons including family members, relatives, siblings and friends, knowing or supposed to know that the recipients may use the information in trading or striking a futures contract involving the Company's securities for their own or others' benefits.
- Directors and executives from Vice President to higher levels in Accounting and Finance Function are required to report the Office of Securities and Exchange Commission their holding of the Company's shares as well as the holdings by spouses, children and related persons through the Company's Strategic Shareholder form. Such report shall be submitted on the appointment date and within 3 business days after a change in the shareholdings following a buy, sell or transfer. They shall also report the shareholdings to the Board of Directors on a monthly basis.
- Directors, the Management and executives from vice president or equivalent levels, relevant officers, their spouses and underaged children as well as persons knowing of the Company's significant information that will influence the Company's share prices from buying/selling the Company's shares or recommending others to do so during a 30-day period prior to the public disclosure of such information, during a 24-hour period after the public disclosure, or during any given Blackout Period.
- Directors or top executives from Executive Vice President or equivalent levels, their spouses and underaged children, if wanting to buy or sell the Company's shares, shall inform the Company's Secretary at least 1 day prior to the transaction date.

Supervision and monitoring of conflict of interest prevention

The Audit Committee plays a leading role in supervising, monitoring and tracing conflict of interest, having the Internal Audit Division responsible for the annual assessment of sufficiency and suitability of internal control in collaboration with relevant units.

In 2022, RATCH reviewed the sufficiency and efficiency of the internal control system and monitor the measures against wrongful utilization of the Company's and subsidiaries' assets and transactions with possible conflict of interest or with related parties. Details appear in Form 56-1 One Report's Item: Internal Control.

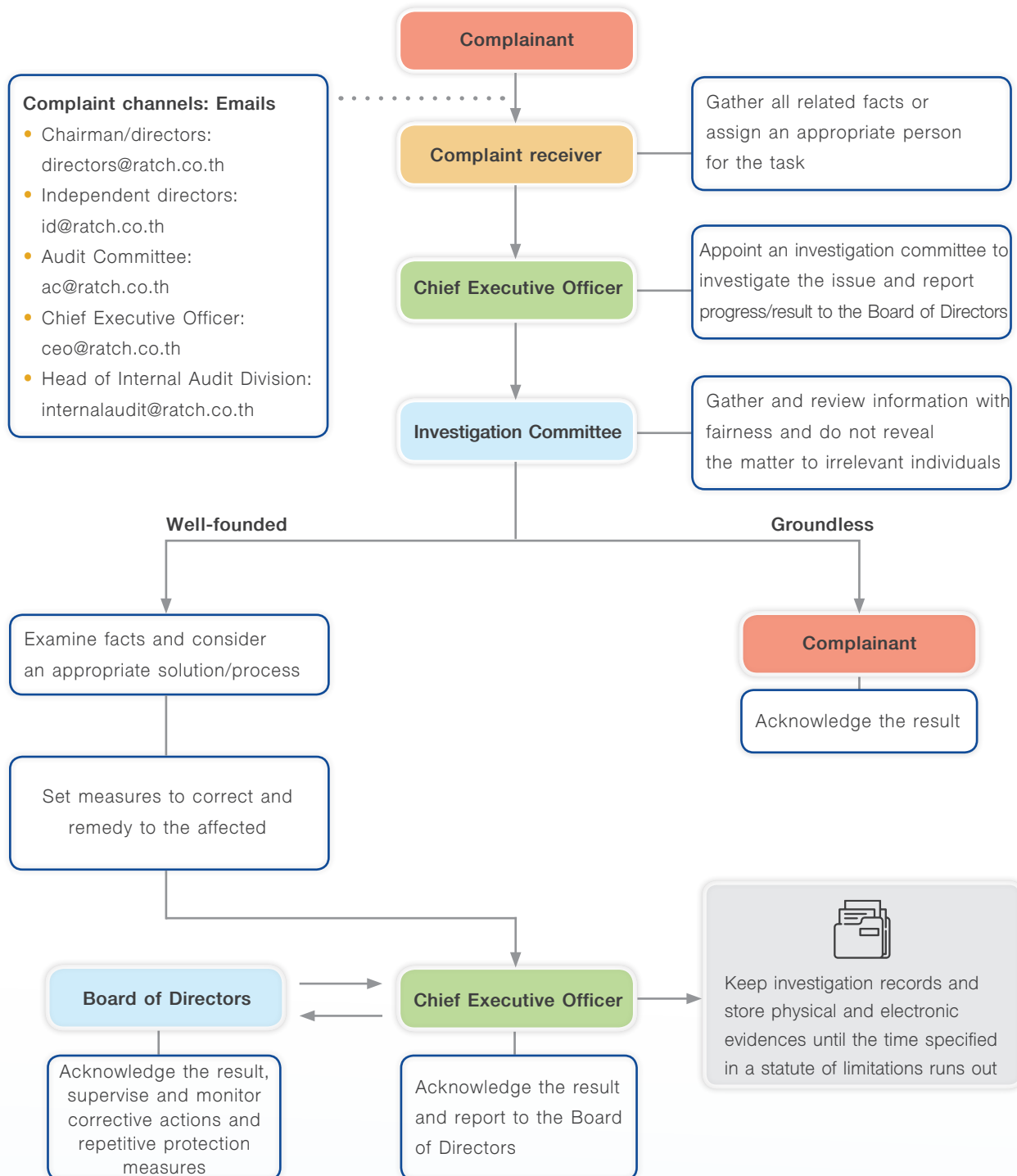


[Read more in
56-1 One-Report](#)

Complaint and Whistleblowing Channel



Complaint Handling Procedure



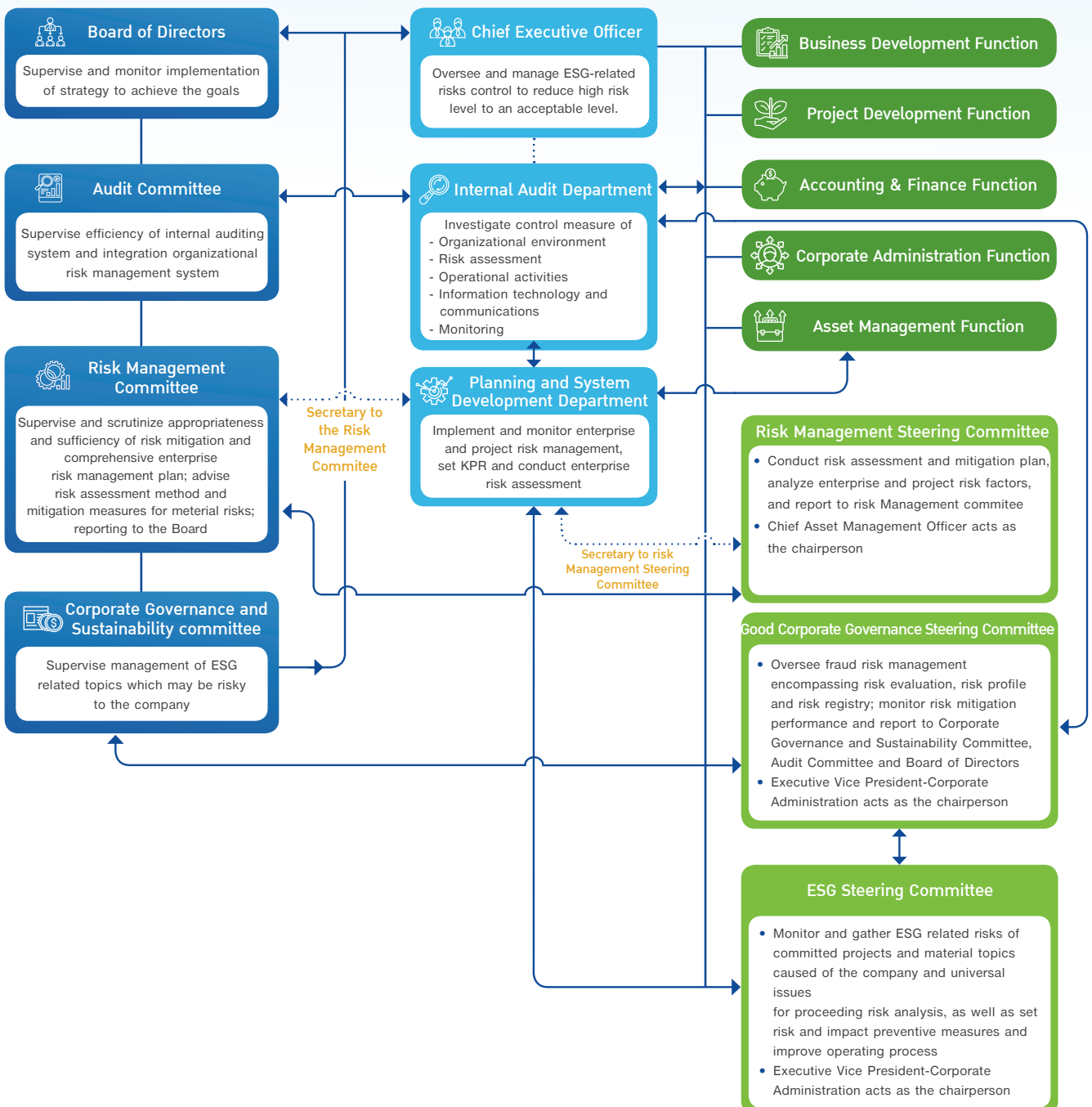
In 2022, RATCH maintained its commitment to follow the Code of Conduct and fight against all forms of frauds. In the year, the Company received “no whistleblowing report/complaint relating to fraud or any acts that may have involved frauds.”

Risk Management and Internal Control

RATCH realizes the importance of efficient risk management and control, as it warrants the chance of success and minimizes the chance of failure and loss. The efficient system will also reduce operational uncertainties or, if unavoidable, keep them within the risk appetite to ensure business stability and continuity.

Internal control is a main tool of risk management. Internal control with adequate efficiency and effectiveness can contain risks in line with risk appetite and enable the company to achieve objectives and appropriately address stakeholders' needs.

Governance on risk management and internal control



Risk management

Risk factor	Risk driver	Control and management method
Enterprise Risk		
Strategic Risk Risk level : Medium	<ul style="list-style-type: none"> • Transition to low-carbon society leading to a change in business models. • Further overseas expansion. • Limitations of human capital in supporting business expansion in light of ageing society. 	<ul style="list-style-type: none"> • Raise the renewable energy investment. • Diversify more into infrastructure and local/overseas businesses with high growth potential and technology/innovation that supports low-carbon society. • Assess investment risks in ESG aspects, in line with the company's risk appetite. • Establish the human resource development plan in line with business expansion plan and seek supports from experts to fill the gap.
Operational Risk Risk level : Low	<ul style="list-style-type: none"> • Maintenance of machinery efficiency in line with production contracts. • Unplanned outage • Construction delay that derails the commercial operation plan. • Construction cost overrun 	<ul style="list-style-type: none"> • Analyze project efficiency and availability to estimate the revenue generation capacity. • Formulate the production cost management plan. • Set power plant maintenance schedules in line with PPAs. • Control the quality and standards of power plant maintenance, to reduce the unnecessary resource utilization. • Ensure under-construction/development projects meet project timeline. • Prepare the management plans concerning safety, environmental quality and relationship building with community; and continuously monitor the implementation. • Assess the operational risks of commercially-operating power plants and under-construction projects in both technical and financial aspects.
Financial Risk Risk level : Low	<ul style="list-style-type: none"> • Further overseas expansion • Volatility in interest rates and foreign exchange rates driven by global economic uncertainties and its impacts on the company's financial cost and liquidity. 	<ul style="list-style-type: none"> • Manage financial risks in line with the financial policy, to contain the possible impacts from the volatility in interest rates, foreign exchange rates and liquidity at the appropriate and acceptable level. • Make financial planning both in terms of the values and time period to suit the company's investment plan so as to reduce expenses and financial cost more efficiently. • Explore new sources of fund and financial instruments that fit types of project, such as green loans/bonds or sustainability-linked loans.

Risk factor	Risk driver	Control and management method
Enterprise Risk (Continue)		
<p>Compliance Risk</p> <p>Risk level : Low</p>	<ul style="list-style-type: none"> • More investment and deeper diversification into new businesses domestically and abroad which involve varying and more complicated laws, regulations and criteria. • Diverse traditions and cultures in varying countries. • Transition to low-carbon society leading to legal amendments and more business requirements. 	<ul style="list-style-type: none"> • Study the laws, regulations, principles, procedures, rules, traditions and cultures of that particular country comprehensively and thoroughly; and crosscheck with reliable sources. • Review the information together with legal advisors with expertise and experience in the investment destinations to reduce risks. • Seek local partners that have experience and expertise in a particular business and local context to reduce the impacts and risks related to incompliance with laws, traditions or norms. • Control and monitor employees at all levels regarding their compliance with the Anti-Fraud and Corruption policy.
Emerging Risk		
<p>Climate Change</p> <p>Risk level : Medium</p>	<ul style="list-style-type: none"> • Increasing frequency and severity of natural disasters. • International efforts to limit the use of coal and fossil fuels in electricity generation, in order to reduce carbon emissions and keep global temperatures from exceeding 1.5 degrees Celcius. • Regulatory actions to control carbon emissions, for example via carbon tax. 	<ul style="list-style-type: none"> • Prepare the Climate Change Strategy and study greenhouse gas emission management and reduction approaches for the setting of emission targets to achieve carbon neutrality in 2050. • Set the target to raise renewable energy capacity to at least 25% of total capacity within 2025. • Invest more in energy-related technology and innovation that supports carbon neutrality / Net Zero target. • Promote reforestation and forest conservation for carbon sequestration. • Require power plants to prepare GHG inventory and estimate carbon footprints, for the formulation of GHG management and emission reduction plan and targets. • Study carbon credit trading, carbon pricing and carbon offsetting mechanisms.

Risk factor	Risk driver	Control and management method
(Emerging Risk (Continue))		
<p>Human Rights Risk</p> <p>Risk level : Low</p>	<ul style="list-style-type: none"> Exposure in various businesses in several countries involves a great number of direct and indirect stakeholders from employees, suppliers and partners to community and a chance of operational impacts on these stakeholder groups. 	<ul style="list-style-type: none"> Constantly monitor the compliance with the Human Rights Policy and the Supplier Code of Conduct. Constantly conduct human rights risks and impacts assessment; set preventive and mitigating measures; and prepare the compensation and remediation process in line with international standards. Constantly assess safety and occupational health risks; and review safety measures for employees, suppliers, sub-contractors and community.
<p>Cybersecurity Threat</p> <p>Risk level : Low</p>	<ul style="list-style-type: none"> Rapid development of information technology and IT systems that underpin business operations. Digital transformation leading to possible breach, theft or destruction of information that endangers operation/business continuity. 	<ul style="list-style-type: none"> Set security measures for essential IT systems concerning the backup system, password setting, identity authentication, etc. Set IT risk management guidelines, define the duties of individuals responsible for IT risk management; and prepare the system recovery plan. Assess cybersecurity risks in line with international standards, constantly test the system and set necessary measures to close the gaps.



Internal Control

RATCH has adopted the Committee of Sponsoring Organization of the Treadway Commission's COSO 2013 standard in conducting the internal control. The emphasis is placed on 3 aspects - the operations, reporting and compliance with relevant regulations. The Audit Committee is tasked to supervise, monitor and examine the internal control system and the Internal Audit Department to evaluate the system's sufficiency and suitability on a yearly basis.

Performance in 2022

The Internal Audit Department evaluated the 5 components of the internal control system.

Evaluation	results
1. Control Environment	<ul style="list-style-type: none"> • The Board of Directors proclaimed the Code of Conduct, the Corporate Governance Policy, the Anti-Fraud and Corruption Policy and the policies concerning shareholders, society, the environment and sustainability and monitored the compliance. In 2022, the Human Rights Policy, the Personal Data Protection Policy and Supplier Code of Conduct were introduced. • RATCH received the 2nd recertification of Thai Private Sector Collective Action Against Corruption (CAC)'s membership for a duration of 3 years. • The Key Performance Indicator (KPI) and rewards were clearly set in line with business strategies and plans and the performance against KPI was reported to the Board of Directors. • Favorable work environment was promoted, with continuous capacity building activities for employees. • Employees' awareness and compliance with the Code of Conduct and the Anti-Fraud and Corruption Policy was bolstered through an e-learning system. All were required to pass a test prior to the annual performance evaluation.
2. Risk Assessment	<ul style="list-style-type: none"> • The company's risk management policy was in line with good governance principles and the business strategies, direction and objectives. The Risk Management Committee constantly monitored the activities, reviewed the enterprise and project risk management plans and reported the results on a regular basis. • The risk assessment procedure and steps were executed systematically. The risks were comprehensively identified while the preventive measures were adequate and appropriate.
3. Control Activities	<ul style="list-style-type: none"> • The company's internal control system was comprehensive, covering the organization and business unit levels, to ensure control efficiency and containment of risks within risk appetite. Control measures were stated in the company's regulations.

Evaluation	results
<p>4. Information and Communications</p>	<ul style="list-style-type: none"> • RATCH's information system had proper classification procedures that prevented information leakage and enhanced the efficiency of cross-functional operations. • Internal communications system was efficient. • Information was disclosed via the Stock Exchange of Thailand's channel and the company website. The whistleblowing channel was in place whereby employees or outsiders can file corruption-related complaints or reports to the Board of Directors, the Audit Committee or relevant units. • Financial reports were audited by the accounting and finance chief and an independent auditor, before submission to the Audit Committee. • Internal communications were executed via the Intranet, email and online meetings via Microsoft Teams. Employee meetings were organized to communicate important policies and information. The Knowledge Management System was developed as the data bank of internal knowledge for capacity building. Knowledge-sharing activities were continuously arranged as the stage for an exchange of knowledge and experiences. • The IT security policy and efficient IT-related risk management were in place, along with the emergency plan which was exercised in line with the guidelines of the company's Business Continuity Plan. • The computer security measures were set and risks to IT security were assessed. There was a procedure to watch out for cyberattacks.
<p>5. Monitoring Activities</p>	<ul style="list-style-type: none"> • The implementation of evaluation-based recommendations accordingly to the pre-set agreements with the Management of the company and subsidiaries was monitored on a quarterly basis and the results were reported to the Audit Committee for further submission to the Board of Directors. • The policy and guidelines were set for the immediate reporting of serious fraud incidents, legal violations or unscrupulous acts which significantly affected the company's reputation and financial position to the Board of Directors. Relevant business units were instructed to prepare prevention plans and reported the implementation results to the Management and the Board of Directors. • Business targets and Key Performance Indicator (KPI) of all functions and employees at all levels were set accordingly to the strategic planning and business plans. The performance was benchmarked against targets and failure to meet the target as well as impacts were analysed root cause. The response and corrective plans to reduce impacts were outlined and reported to the Management and the Board of Director. • The risk profile was prepared covering strategic risks, operational risks, financial risks and compliance risks, to determine the likelihood and level of impacts. Measures to keep the risks within risk appetite were devised and the implementation of those measures was monitored and reported to the Risk Management Committee as well as the Board of Directors.

Read more in Risk management topic and Internal Control topic in 56-1 One Report



Read more in
56-1 One-Report

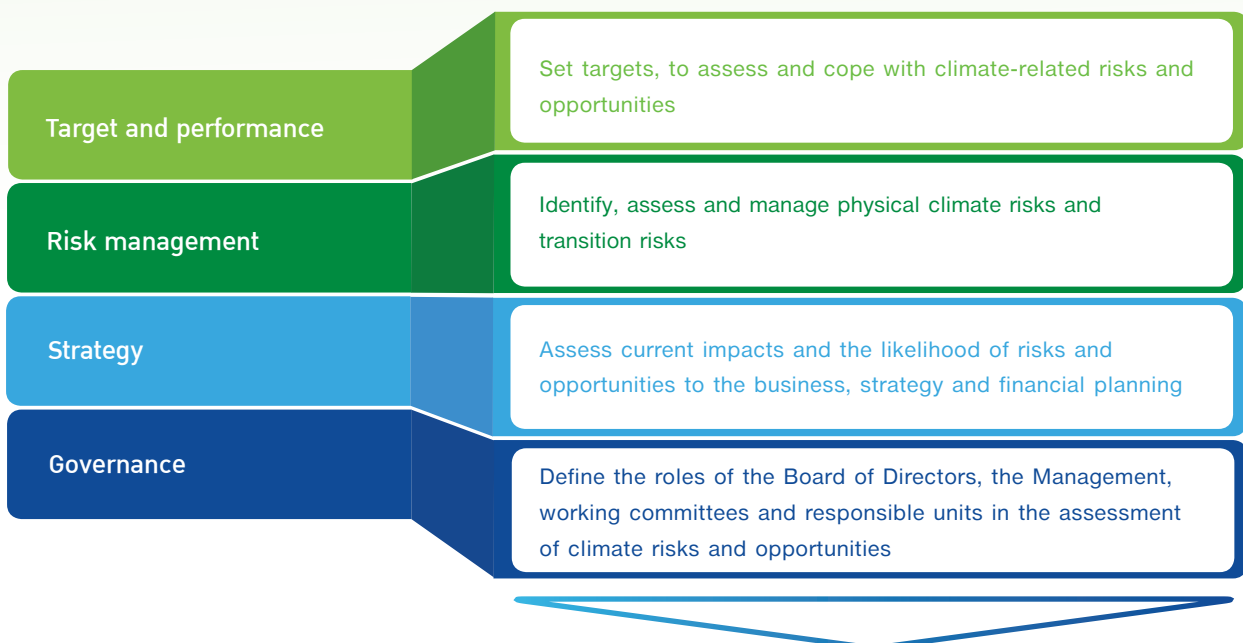
Response to Climate Change



Climate change is an integral part of RATCH's Sustainability Strategy in environmental dimension, as it is a pressing issue in the energy and electricity sector. Stakeholders expect market players to reduce greenhouse gas emissions, so as to limit an increase in global temperature and mitigate climate impacts. RATCH thus prepared the Climate Change Strategy to achieve carbon neutrality in 2050. Approving the strategy, the Board of Directors demanded studies in feasible carbon emission approaches and methods for the formation of Decarbonization Roadmap and setting of achievable targets in alignment with Thailand's target.

The Climate Change Strategy will also shape operational guidelines in support of SDG 12: Responsible Consumption & Production and SDG 13: Climate Action.

Climate Change Response Framework



Targets 12.2: By 2030, achieve the sustainable management and efficient use of natural resources.

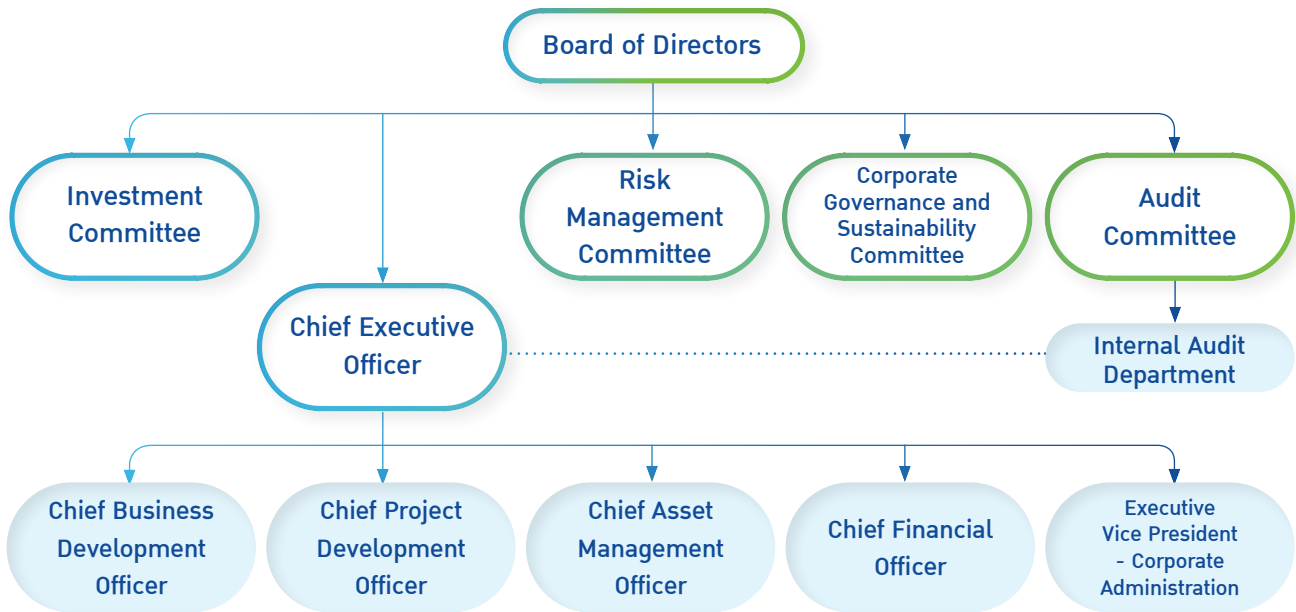
Targets 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.



Targets 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Targets 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Governance on Climate Change



Organizational body	Role and responsibility concerning climate change
Board of Directors	<ul style="list-style-type: none"> Extend its supervisory role to cover climate change, by integrating it with the corporate risk management system, the internal control system, business strategies and targets Define vision, missions, business direction and strategies that ensures the company's readiness for the energy transition and the journey towards low-carbon businesses Supervise and give guidance on sustainability strategy, climate change strategy, action plans and targets as well as monitor the implementation of strategies and action plans Endorse climate strategy and action plans including related indicators and targets, ensuring the compatibility with the company's condition and business context Monitor progress of climate actions, with supports from Risk Management Committee and Audit Committee
Risk Management Committee	<ul style="list-style-type: none"> Integrate climate risks and opportunities with the enterprise risk management and risk assessment processes Supervise and monitor the efficiency of the risk management system and the internal control system as well as the alignment between the Company's business strategy/ targets and the Climate Change Strategy
Corporate Governance and Sustainability Committee	<ul style="list-style-type: none"> Supervise and monitor the progress of Sustainability Strategy and Climate Change Strategy as well as the management of enterprise risks and opportunities Approve and give guidance on Climate Change Strategy, related policies, action plans and targets under the strategy and submit the guidance for the Board of Directors' approval
Audit Committee	<ul style="list-style-type: none"> Follow the implementation of Climate Change Strategy and give advice

Organizational body	Role and responsibility concerning climate change
Investment Committee	<ul style="list-style-type: none"> Supervise the investment decision-making process concerning climate risk assessment as well as risk management and likelihood in the enterprise and project levels
Chief Executive Officer	<ul style="list-style-type: none"> Cascade the Board of Directors' guidelines through the preparation of an action plan in alignment with Climate Change Strategy Follow up on the operational efficiency and progress against the plan compared with the Board of Directors-endorsed targets
Chief Business Development Officer	<ul style="list-style-type: none"> Integrate climate risks and likelihood with project feasibility studies and due diligence in support of the investment decision-making process
Chief Project Development Officer	<ul style="list-style-type: none"> Monitor the operations and compliance with laws, regulations, EIA measures and other relevant conditions during the construction stage Consider climate risks and relevant regulations a part of the assessment of new projects' suitability
Chief Asset Management Officer	<ul style="list-style-type: none"> Control the efficiency of risk management and ESG operations of the Company, subsidiaries and joint ventures Monitor asset operations, greenhouse gas emissions and climate risks of power plants/projects Execute carbon emission reduction projects and manage related climate risks at power plants/assets
Chief Financial Officer	<ul style="list-style-type: none"> Source funds for the Company Group's development/investment in green or eco-friendly projects Monitor and ensure the conformity of responses to climate risks with creditors' conditions, accounting standards and action-report reporting to relevant authorities
Executive Vice President - Corporate Administration	<ul style="list-style-type: none"> Execute actions under the Sustainability Strategy and the Climate Change Strategy and compliance with the roadmap and targets of the Company and controlled entities Monitor the execution and progress of action plans and targets and report the performance to the Board of Directors and relevant external authorities

Assessment of climate-related risks and opportunities

In 2022, the 22 entities in which has operation in Thailand, Australia, Indonesia and Vietnam conducted the assessment on climate risks accordingly to the Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD). They are categorized as physical risks that cover acute risks and chronic risks; and transition risks, based on a change in stakeholder mindset, technology as well as relevant policies, legislation and rules.

Identification of physical risks

Acute physical risks

Extreme climate events like storms and flooding

- Flooding leads to sedimentation in the dams that may cause harm or damage to turbines.
- Water stress or drought leads to water shortage for power generation activities.
- Lightning may force a stop on power plants and disturb the electricity generation system.

Chronic physical risks

long-term shifts in climate patterns like higher temperatures that cause sea level rise or heat waves

- Heat waves may affect or reduce job operators' ability to work and power generation efficiency





Physical risk analysis





RATCH based the assessment of physical risks of the company and operational controlled entities in Thailand, Australia, Indonesia and Vietnam on 2 scenarios:

- Scenario RCP2.6: Average global temperature could be 1.6 degree Celcius warmer in 2050
- Scenario RCP8.5: Average global temperature could be 4.3 degree Celcius warmer in 2050

The risk assessment took into consideration significant impacts on the company's strategies in 6 aspects: 1) finance 2) health, safety and the environment 3) partners/customers 4) regulatory landscape 5) reputation, image and society and 6) target/achievements. The impacts may be witnessed in 3 impact periods: short term (within 2 years), medium term (3-5 years) and long term (6-10 years). The assessment result is as follows:

Risk factor	Drought
Type of risk	Physical risk
Impact forecast	<ul style="list-style-type: none"> • Water shortage and limited volume of usable water • Insufficient volume of usable water, affecting production and revenue
Impact period	Short and medium terms
Assessment result	Australia's drought timescale tends to lengthen the most under Scenario RCP2.6 (8%) in 2030 and 2050. A similar result is established under Scenario RCP 8.5.
Examples of financial impacts	1) Small power plants' THB 0.6 million investment in reservoir construction 2) Small power plants' THB 12 million investment in water quality improvement system

Risk factor	Drought						
Change in maximum drought period (versus the base period 1995-2014)		Base years	RCP2.6 (1.6°C)		RCP8.5 (4.3°C)		<ul style="list-style-type: none"> ● No impact ● Low impact ● Medium impact ● High impact
		1995-2014	2030	2050	2030	2050	
	 Thailand						
	 Australia						
	 Vietnam						
 Indonesia							
Sources: CCKP. World Bank Group, Climate Change Knowledge Portal							
Response measure	<ul style="list-style-type: none"> • More investment to secure supplementary water sources 						

Risk factor	Flooding						
Type of risk	Physical risk						
Impact forecast	<ul style="list-style-type: none"> • Damage to high-value assets and machinery, pushing financial damages beyond the maintenance cost • In case of severe flooding, damage to the transmission grid which is an integral part of the electricity system as well as suppliers' major parts 						
Impact period	Short and medium terms						
Assessment result	The maximum number of days with heavy rainfall in Thailand, Vietnam and Indonesia tend to increase the most under Scenario RCP 8.5 in 2050.						
Example of financial impacts	Small power plants' THB 50 million investment in flood preventing foundation						
Change in wind speed (compared to the base period 1995-2014)		Base years	RCP2.6 (1.6°C)		RCP8.5 (4.3°C)		<ul style="list-style-type: none"> ● No impact ● Low impact ● Medium impact ● High impact
		1995-2014	2030	2050	2030	2050	
	 Thailand						
	 Australia						
	 Vietnam						
 Indonesia							
Sources: CCKP. World Bank Group, Climate Change Knowledge Portal							
Response measure	<ul style="list-style-type: none"> • Connection with water-level monitoring networks • Construction of rain reservoirs and water-retention system to deal with heavy rainfall or flooding (usable during shortage periods) 						

Risk factor	Extreme weather conditions																																					
Type of risk	Physical risk																																					
Impact forecast	<ul style="list-style-type: none"> • Damage to infrastructure, machinery and equipment • Injuries of job operators due to falling objects • Damage to the transmission grid from lightning and damage to infrastructure from hail storms <p>Assessment result, however, shows these risks have not yet imposed significant impacts on the company.</p>																																					
Impact period	Long term																																					
Assessment result	The wind speed in Thailand, Vietnam and Indonesia tends to increase the most under Scenario RCP8.5 in 2050.																																					
Example of financial impacts	No impact on the company																																					
Change in wind speed (compared to the base period 1995-2014)	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th>Base years</th> <th colspan="2">RCP2.6 (1.6°C)</th> <th colspan="2">RCP8.5 (4.3°C)</th> <th rowspan="2">Legend</th> </tr> <tr> <th>1995-2014</th> <th>2030</th> <th>2050</th> <th>2030</th> <th>2050</th> </tr> </thead> <tbody> <tr> <td> Thailand</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="4"> <ul style="list-style-type: none"> ● No impact ● Low impact ● Medium impact ● High impact </td> </tr> <tr> <td> Australia</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Vietnam</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Indonesia</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Sources: CCKP, World Bank Group, Climate Change Knowledge Portal</p>		Base years	RCP2.6 (1.6°C)		RCP8.5 (4.3°C)		Legend	1995-2014	2030	2050	2030	2050	Thailand						<ul style="list-style-type: none"> ● No impact ● Low impact ● Medium impact ● High impact 	Australia						Vietnam						Indonesia					
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Vietnam																																						
Indonesia																																						
Response measure	<ul style="list-style-type: none"> • No impact on the Company Group 																																					

Summary of physical risk assessment

- Operational controlled entities face a drought risk. They may encounter water shortage or the volume of raw water may be limited or insufficient to sustain the generation, resulting in an impact on the Company Group's principal revenue. The Company Group has responded to this risk by investing in supplementary water sources and securing emergency water supply to replenish insufficient supply from main water sources and considering a shift from water to other renewable energy for power generation like wind and solar power project in Australia where facing high drought risk in the short and medium terms from 2030 onwards.
- Operational controlled entities face a risk of flooding that can cause damage to assets and major equipment for the production and transmission. The risk level in 2050 is high in Thailand, forcing the Company Group to establish water-level monitoring measures and invest in rainfall reservoirs and water-retention systems to relieve future flooding impacts.
- The impacts from extreme weather events remain insignificant on the Company Group, in terms of damage to infrastructure, injuries or the power grid in case of lightning.

Transition Risks

Transition Risks

Marketing



Consumer/customer behavioral changes

- Customers preferring renewable energy and services that can limit carbon emissions in Scope 2

Technology



Change in technology and innovation

- Emergence of new products and services like new forms of renewable energy or energy management systems

Regulatory landscape



Change in legislation, regulations and policies

- Enforcement of legislation relating to carbon emission reduction like the carbon trading rules on the right to emit greenhouse gases and the Power Development Plan for renewable energy that demands additional investment from energy companies for climate impact mitigation

Reputation and image



Change in stakeholder mindset

- Stakeholders particularly investors pay more attention to corporate actions on climate change. Some investors have pulled out investment in fossil fuel power projects.

Analysis of transition risks

RATCH applies the scenario analysis to analyse transition risks that may cause significant impacts on the strategies in 6 aspects: 1) finance 2) health, safety and the environment 3) partners/customers 4) regulatory landscape 5) reputation and image and 6) target/achievements. The impacts may be witnessed in the short term (within 2 years), medium term (3-5 years) and long term (6-10 years).

Scenarios for analysis of transition risks

Scenario	Explanation	Target years towards Net Zero Emission	Change in global temperature in 2100
State Policy Scenario	<ul style="list-style-type: none"> • State policies and NDC targets under Paris Agreement • Thailand's 2015 policies announced after COP21 	<ul style="list-style-type: none"> • Short-term: Reduce GHG emissions by 20% in 2030 from the base year 2020 (0.8% per annum) • Long-term: No policy on net zero emissions 	Above 2°C

Scenario	Explanation	Target years towards Net Zero Emission	Change in global temperature in 2100
Sustainable Development Scenario	<ul style="list-style-type: none"> Commitment to achieve net zero greenhouse gas emissions and attempts to achieve reduction in the near future: developed nations target to achieve that in 2050, China in 2060 and other countries by 2070 at the latest Thailand's declared commitment on emission reduction in 2021 after COP26 	<ul style="list-style-type: none"> Short-term: Reduce GHG emissions by 36.9% in 2030 from the base year 2020 Long term: Declaration of commitment towards NZE in 2065 Referring to SBTi to maintain global temperature increase between 1.5-2.0°C 	1.5-1.7°C
Net Zero Emissions (NZE)	<ul style="list-style-type: none"> SDG's net zero emissions by 2050 for the energy sector, chiefly concerning access to modern energy by 2030 and energy efficiency to reduce impacts on air quality 	<ul style="list-style-type: none"> Short term: Reduce GHG emissions by 42% in 2030 from the base year 2020 Long term: Declaration of commitment towards NZE in 2050 Referring SBTi to maintain global temperature increase at no more than 1.5°C 	Maintained at 1.5°C

Summary of analysis on transition risks

The possible imposition of carbon tax to control or limit greenhouse gas emissions poses a risk on the expenses of power generation entities, which will rise in relation to emission volume. The risk may be eminent in the next 3-5 years. The company's response measures are as follows:

Risk	Type of risk	Impact period	Risk and impact on finance	Response measure
Imposition of carbon tax	Transition	Medium term (3-5 years)	<ul style="list-style-type: none"> Stricter policy and legislation on carbon emissions control leading to the imposition of carbon tax An increase in operating expenses in relation to emission volume 	<ul style="list-style-type: none"> Invest in low-carbon/carbon storage technology for existing power plants with high emission volume, to limit production-related emissions Acquire new renewable energy assets or fossil fuel power plants with installed carbon storage technology Avoid/abolish investment in coal-fired power plants

Analysis of climate-related opportunities

RATCH had analyzed transition opportunities in the marketing, technology and regulatory landscape aspects. The result revealed opportunities to diversify to non-power businesses like hydrogen; renewable energy; and the installation, production and maintenance services for renewable power projects

Opportunity	Type of opportunity	Period	Opportunity and impact on finance	Management approach
Diversification to non-power businesses	Marketing	Medium term	<ul style="list-style-type: none"> RATCH plans for hydrogen use and study technology development in aboard 	<ul style="list-style-type: none"> Invest in green hydrogen production and provide utility and infrastructure services Invest and collaborate with business partners in researches
Shift to renewable energy	Energy source	Medium term	<ul style="list-style-type: none"> RATCH's plans to raise renewable energy generation in support of national and global carbon emission targets, setting to achieve the 25% and 40% ratios of 10,000 MW capacity in 2025 and 2035, respectively 	<ul style="list-style-type: none"> Emphasize the generation from all forms of solar power (solar panel, solar rooftop and solar floating) and businesses involving with solar and wind power as well as installation, production and maintenance services

Climate Change Strategy Framework

The above assessment results shaped the Climate Change Strategy, formulated as operational guidelines on the company's climate mitigation and adaptation. The strategy consists of 2 components.

- 1) Greenhouse gas reduction, focusing on 3 key areas which as production efficiency enhancement (emission reduction), diversification to green businesses and carbon offsetting and trading.
- 2) Internal and external collaboration involving the extended networking with external organizations and the operational uplifting through internal climate management.

Climate Change Strategy



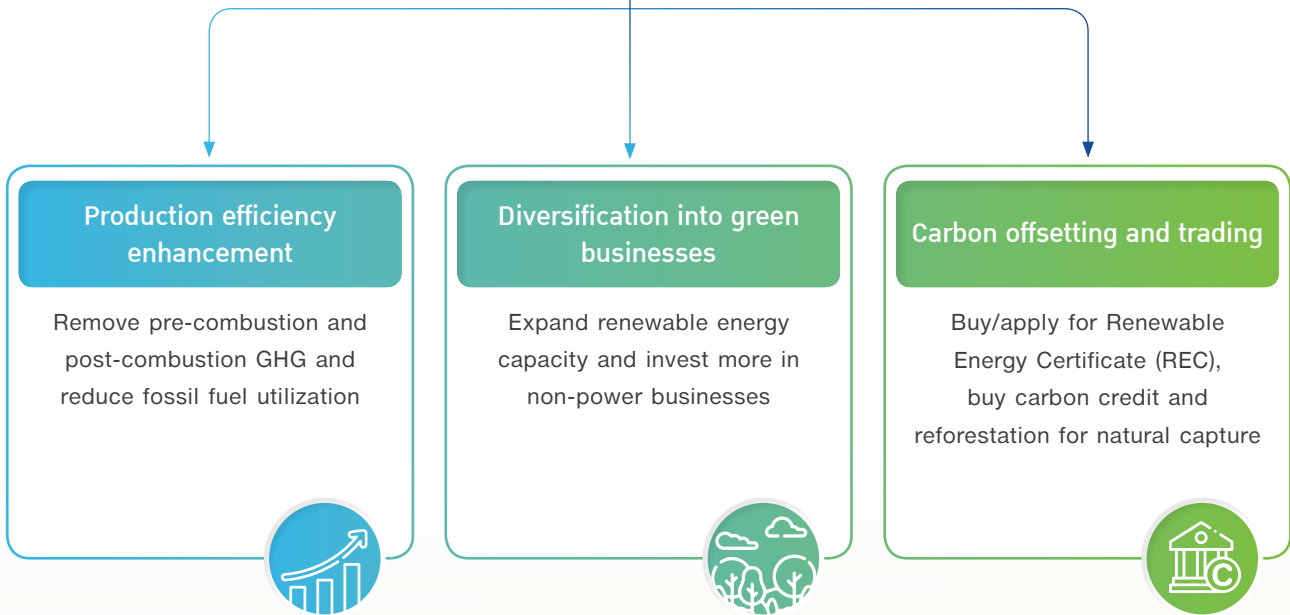
Extended networking with external organizations

- Seek collaboration with stakeholders - suppliers and customers - in promoting emission reduction and resource recycling
- Partner with industry associations/ organizations/government offices

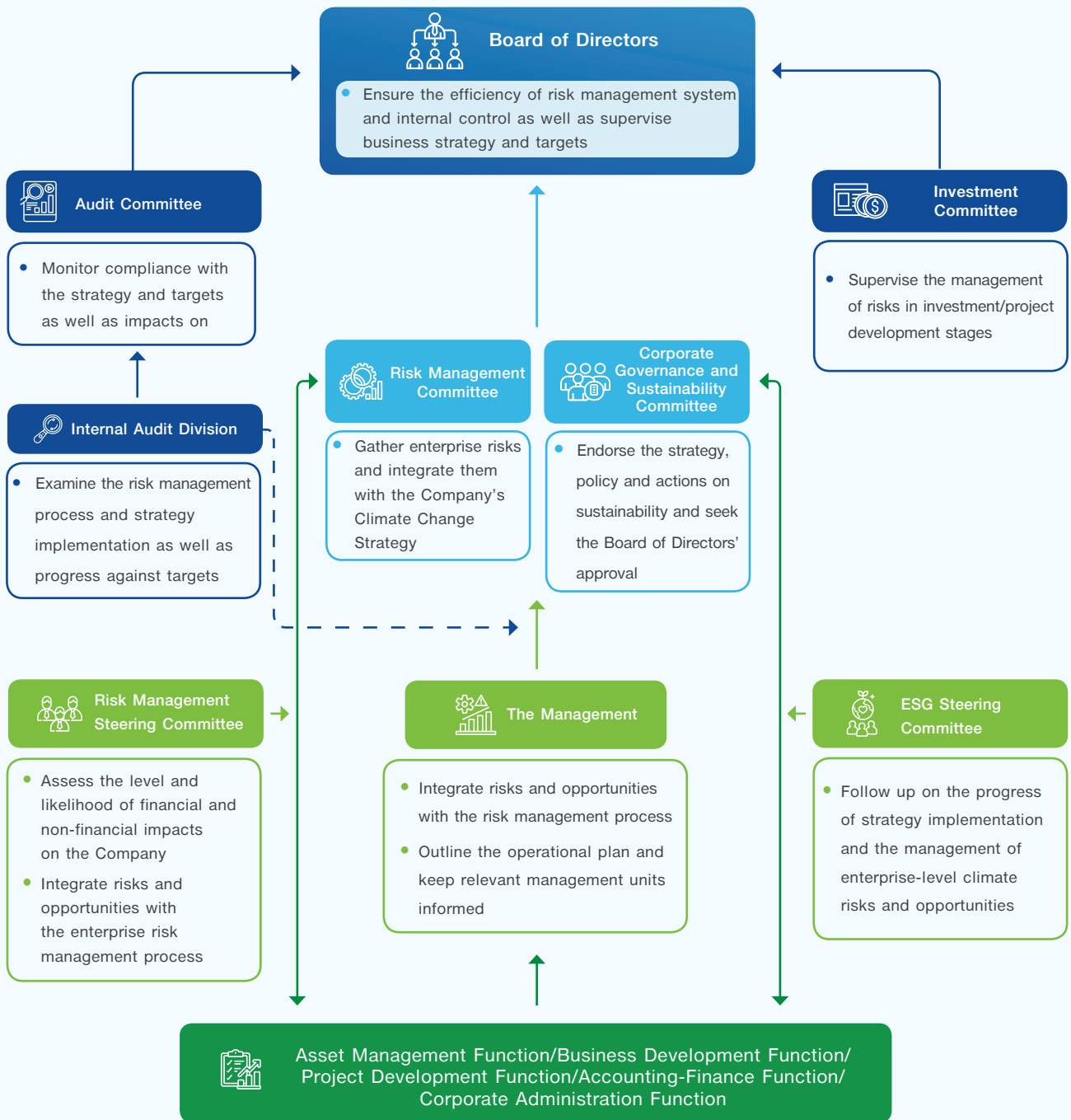


Operational uplifting through internal climate management

- Supervise climate change coping actions
- Consider rewarding employees at all levels for their climate actions
- Integrate the climate risk assessment process with the enterprise risk assessment process
- Set the internal carbon pricing (ICP), to define the monetary value of per-unit internal carbon emissions



Climate risk and opportunity management process



- Stay alert for climate issues and impacts and outline suitable preventive measures
- Assess risks and opportunities in financial and non-financial terms in the project and enterprise levels
- Prioritize risks and opportunities based on the Company's criteria
- Record climate impacts in financial and non-financial terms and identify issues that may cause impacts
- Study the data of impacts on the Company and industry to support risk/investment suitability analysis
- Promote understanding and awareness in climate risks/impacts among employees and stakeholders
- Initiate and develop carbon emission activities based on forestation and forest conservation

Targets and performance

Strategy	2025 targets	2035 targets
1. Setting of percentage shares of energy sources in electricity generation	<ul style="list-style-type: none"> Total capacity - 10,000 MW Fossil fuel - 75% Renewable energy - 25% 	<ul style="list-style-type: none"> Total capacity - 10,000 MW Fossil fuel - 60% Renewable energy - 40%
2. Emission reduction	<ul style="list-style-type: none"> 6 MtCO₂e of emissions reduced or 70% of emissions in the base year 2015 Emissions per kilowatt-hour slashed by 12% from the base year 2015 	<ul style="list-style-type: none"> 10 MtCO₂e of emissions reduced or 100% of emissions in the base year 2015 Emissions per kilowatt-hour slashed by 25% from the base year 2015
3. Enhancement of carbon capture	<ul style="list-style-type: none"> Amount of captured carbon: 83,000 tCO₂e 	<ul style="list-style-type: none"> Amount of sequestered carbon: 280,000 tCO₂e
4. Education and awareness building	<ul style="list-style-type: none"> Employees' training attendance: 80% Community engagement in energy conservation, aimed 80% of the target group 	<ul style="list-style-type: none"> Employees' training attendance: 90% Community engagement in energy conservation, aimed 90% of the target group
5. Information disclosure	<ul style="list-style-type: none"> Sustainability Report under GRI Standard Form 56-1 One Report Carbon Disclosure Project (CDP) Participation in domestic and international organizations' sustainability assessment 	<ul style="list-style-type: none"> Sustainability Report under GRI or relevant standards Form 56-1 One Report Carbon Disclosure Project (CDP) Participation in domestic and international organizations' sustainability assessment

Performance on emission reduction in 2022

Targets

RATCH set a target to reduce direct emissions (Scope 1) and indirect emissions (Scope 2) in 2025 by 70% from the base year 2014. The amount of emissions is based on the comparison of the emissions per distributed kilowatt-hour and the Grid Emission Factor, as in the previous years.

Indicator	Unit	2018	2019	2020	2021	2022
Direct emissions (Scope 1)	tCO ₂ e	6,935,752	5,875,291	6,258,865	6,412,471	8,515,892
Indirect emissions from electricity use (Scope 2) – Location-based method	tCO ₂ e	33,618	43,955	26,960	38,918	84,606
Indirect emissions from electricity use (Scope 2) – Market-based method	tCO ₂ e	-	-	-	-	-
All other indirect emissions (Scope 3)	tCO ₂ e	N/A	N/A	3,131	2,662,156	3,025,526
Carbon intensity (Scope 1+2) per kilowatt-hour of net power output	tCO ₂ e/ MWh	0.4059	0.4050	0.4124	0.4308	0.4198
Targets		<ul style="list-style-type: none"> Reduce emissions in Scope 1 and Scope 2 by 70% in 2025 (from the base year 2014) To achieve carbon neutrality by 2050 				

Note: The boundary of emission calculation covers:

Boundary of GHG report	2018	2019	2020	2021	2022
Ratchaburi Power Plant (RGCO)	✓	✓	✓	✓	✓
Tri-Energy Power Plant (TECO)	✓	✓	✓	-	-
RATCH-Australia power plants (RAC)	✓	✓	✓	✓	✓
Nava Nakorn Power Plant (NNEG)	✓	✓	✓	✓	✓
RATCH-Cogeneration Power Plant (RCO)	-	-	✓	✓	✓
Berkprai Cogeneration Power Plant (BPC)	-	-	✓	✓	✓
Nexif Power Plant (NRER)	-	-	-	-	✓

Tracking GHG emissions through carbon footprint assessment

In 2022, Sahacogen (Chonburi) Power Plant, in which RATCH has operational control, assessed their carbon footprints in line with Thailand Greenhouse Gas Management (Public Organization)'s carbon footprint calculation and reporting criteria, using the amounts that included other indirect emissions (Scope 3) as the base year. The power plants plan to seek TGO's carbon footprint certificate in 2023.

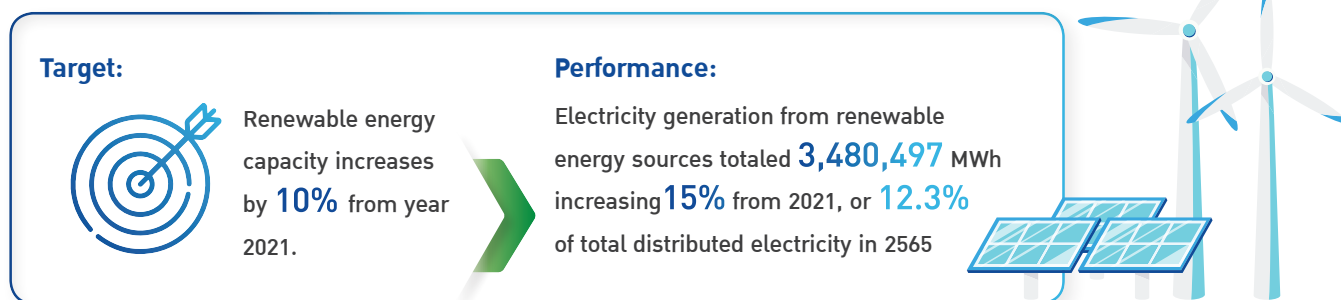
Amount of emissions (tCO₂e) based on carbon footprint for organization (CFO) assessment

Power plant	Direct emissions (Scope 1)				Indirect emissions (Scope 2)				Other indirect emissions (Scope 3)		
	(base year)	2020	2021	2022*	(base year)	2020	2021	2022*	2020	2021	2022*
Ratchaburi	7,128,375 (2015)	4,997,704	4,950,948	6,302,505	27,702 (2015)	18,837	28,131	151,050	-	2,413,616	2,729,674
RATCH-Cogeneration	-	313,927	300,854	307,541	-	25	1,069	148	3,131	88,628	2,054
Nava Nakorn	-	-	515,185	485,947	-	-	50	31	-	159,912	153,777
Sahacogen (Chonburi)	-	-	-	525,399	-	-	-	16	-	-	139,785
RATCH Group Building	73 (2018)	664	43	58	1,110 (2018)	888	813	846	-	36	46

Note: Data under review

Emission reduction in 2022

Increase in renewable energy



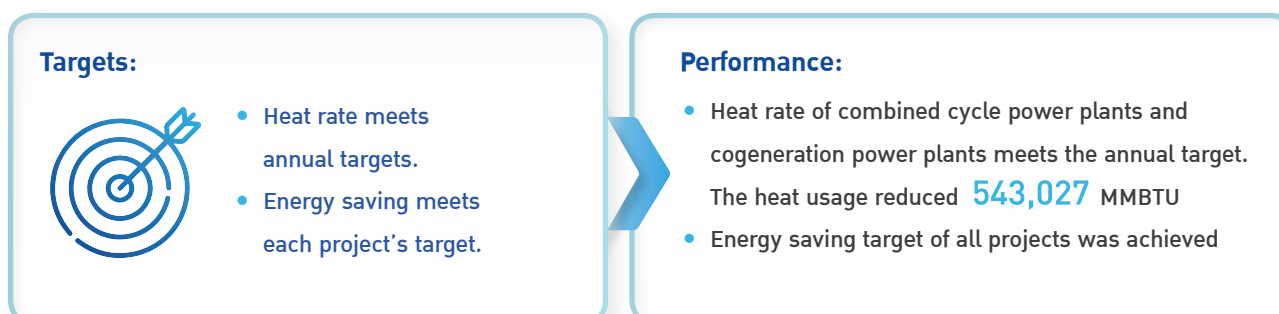
In 2022, RATCH's renewable energy capacity accordingly to the equity installed capacity of commercially-operated power plants totaled 1,551.2* MW, or 15.8% of total capacity of 9,787 MW. Net power output from renewable energy sources reached 3,480,497 megawatts-hour, up by 15 % from 2021 and accounted for 12 % of total output in 2022.

Renewable energy source	Net power output (MWh)		Increase from 2021 (tCO ₂ e)		%
	Total	RATCH's equity sharing	Total	RATCH's equity sharing	
1. Solar power	183,147	131,255	1,261	2,501	1.9
2. Wind power	2,217,480	1,727,537	56,549	85,859	5.2
3. Hydropower	5,005,134	1,527,682	171,347	298,091	24.2
4. Biomass	198,953	94,023	127,936	65,616	231

* Note: excluding the equity installed capacity in EDL-Gen and Bangkok Aviation Fuel Services PCL.

The calculation of emissions from power output from renewable energy sources in 2022, 3,480,497 MWh, showed GHG emissions were reduced by 2,574,709 tCO₂e.

Production efficiency enhancement



All 7 power plants in the Company Group and head office implemented 22 fuel- and energy-saving activities, resulting in 23,620 million BTU of saved heat rate and 5,775 megawatt-hours of saved electric power equivalent to 6,347 tCO₂e of reduced emissions. This translated into a decrease in expenses by THB 2.1 million.

PROJECT/ACTIVITY	2022 Energy-saving target	No. of activities/projects	Saved heat usage (million BTU/year)	Saved energy (kWh/year)	Saved expenses (BAHT/year)	Investment (BAHT)	Reduced GHG emissions (tCO ₂ e)
Ratchaburi Power Plant	Electric power 3,257,000 kWh	4	-	3,210,687	9,634,395	128,000	1,605
Nava Nakorn Power Plant	Heat rate 11,659 MMBTU	3	2,793	-	1,448,270	-	409
Berkprai Cogeneration	Electric power 156,363 kWh	5	1,565	169,989	824,123	-	314
RATCH cogeneration	Electric power 725,810 kWh	3	-	974,484	3,897,936	1,077,440	487
Sahacogen	Energy 26,336,936 MJ	5	19,261	1,153,927	3,817,335	396,574	3,399
Head Office	Electric power 19,523 kWh	2	-	265,954	180,959	543,610	133

Overall GHG emission in 2022

Due to increasing power demand, the operational-controlled fossil-fuel power plants; Ratchaburi, Nava Nakorn, Berkprai, RATCH Cogeneration and Australia-based Kemerton, generated much more electricity than 2021, with the exception of less generation of Australia-based Townsville power plant. Additionally, RATCH had another two operating power plants; Nexif RATCH Energy Rayong and Sahacogen consequent to number of power plants under RATCH's management control in 2021 increasing to 8 compared to 6 last year, and equity commercial operating capacity rising to 4,638 MW or 47.39% of total equity capacity.

After putting efforts in and GHG reduction actions, the volume of GHG Scope 1 and 2 released by 8 power plants totaled 8,592,197 tCO₂e and 3,025,290 tCO₂e of Scope 3.

Emission reduction under T-VER program

Application for carbon credit certification for Sustainable Forestation Project of Ratchaburi Power Plant

RATCH Group, through Ratchaburi Power Plant, has participated in Thailand Voluntary Emission Reduction Program (T-VER) – Forestation and Green Area, aside from the energy efficiency and renewable energy categories. In 2022, the power plant carried out the first evaluation on the forestation project, covering a 48-rai area in its premise, which was registered for Thailand Greenhouse Gas Management (Public Organization)'s carbon credit certification (Registration #185) on 29 October 2019.

The evaluation showed that additional 390 tCO₂e was sequestered by the teak and broad-leaf mahogany plantation area during 1 September 2019 and 23 September 2022 (3 years and 23 days), or 130 tCO₂e on annual average. The amount was above the 57 tCO₂e projection stated in the application, or 2.3 times, thanks to the favorable condition for teak and broad-leaf mahogany trees and proper maintenance and management. Under the project, weed was under control and tree branches were cut, along with the management of other risks. Through the project, the power plant prepared itself for Thailand's Emission Trading Scheme (ETS).

GHG sequestration	Tons of carbon dioxide equivalent (tCO ₂ e)
(1) Amount of carbon sequestered in the project area during 2019-2022	1,409.83
(2) Amount of carbon sequestered in the project area in the base year 2019	1,019.38
Net amount of sequestered carbon = (1) – (2)	390.45



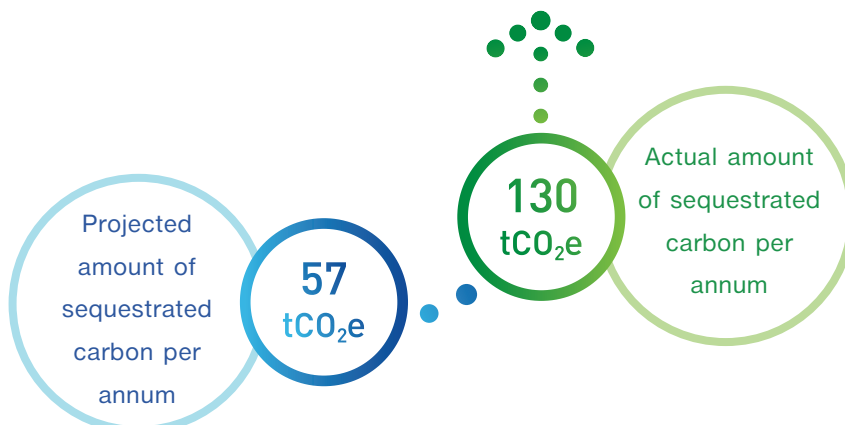
Broad-leaf mahogany (*Swietenia macrophylla*)



Teak (*Tectona grandis*)



The 48-rai broad-leaf mahogany and teak plantation area trees



Performance summary of T-VER projects



Registration No.	Project	Type of project	Status		Crediting period	Amount of carbon credit (tCO ₂ e)		Next certification plan
			Registered	Carbon Credit Certified		Estimated entire period	Certified	
105	Energy Efficiency Project through LED Lighting Replacement by Ratchaburi Electricity Generating Co.,Ltd.	Energy efficiency (EE)	✓	✓	7 years	5,397	3,064 (4 years)	Year 2024
131	Solar Floating Project at Ratchaburi Electricity Generating Co.,Ltd.	Renewable energy (RE)	✓	✓	7 years	12,418	1,513 (1 years)	Year 2567
185	Sustainable Forestation Project of Ratchaburi Power Plant by Ratchaburi Electricity Generating Co.,Ltd.	Forest and Green area (FOR)	✓	✓	20 years	1,140	390 (3 years)	Year 2570
Total						18,955	4,967	

RATCH Group has implemented other GHG-reduction projects/activities including Green Office Project that seeks to reduce the utilization of electricity, vehicle fuel, water and paper consumption as well as waste; and Waste Bank Project at Ratchaburi Power Plant. Including activities at other power plants controlled by the group, additional carbon emissions were cut.

Promotion of external emission reduction

In support of SDG 13 that aims to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters through changes in human activities, RATCH Group has continually supported community and social activities, directly and indirectly, that promote knowledge, understanding and engagement in carbon emission reduction.

Community Energy Project Phase 3 (2020-2022), at Yang Hak sub-district, Pak Tho District, Ratchaburi Province

<p>Target:</p>  <p>Raise the number of households participating and reaping benefits from the project, to help reduce expenses, fuel consumption and carbon emissions to 500</p>	<p>Performance:</p> <p>The number of 500 households benefited from the project, accounting for 15.53 % of households in Yang Hak sub-district, Pak Tho District, Ratchaburi Province</p> 
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In the third year of the Community Energy Project at Yang Hak sub-district, the company evaluated the energy efficiency of 6 water pumps that switched from gasoline to solar power and 8 solar-powered water pumps, given to the community to support 100 households' agricultural activities along with 2 community energy learning centers. The evaluation showed the project reduced greenhouse gases by 40.8 tons of carbon dioxide equivalent in 2022, saving the households' expenses by THB 330,777. The project benefited 500 households or 15.53 % of households in Yang Hak sub-district, Pak Tho District, Ratchaburi Province.

Project impact assessment in 2020-2022

Activity	Social dimension	Economic dimension	Environmental dimension
Solar-powered water pumps (3,400 watt) given to 6 pilot households <ul style="list-style-type: none"> Six sets of solar-powered water pump equipment and sixty 340-watt solar panels (10 panels for each household) Inverter equipment for solar-powered water pumps and electric cabinet 	6 pilot households	Expenses cut by approximately THB 210,870 per year	Carbon emissions reduced by approximately 26 tCO ₂ e per year
<ul style="list-style-type: none"> Eight 600-watt solar-powered water pumps given for community use 	100 households (Serving agricultural purposes of 98 households and consumption purposes of 17 households)	Expenses cut by approximately THB 49,617 per year	Carbon emissions reduced by approximately 6.12 tCO ₂ e per year
<ul style="list-style-type: none"> Solar-powered pumping system given to 2 learning centers 	2 learning centers	Expenses cut by approximately THB 70,290 per year	Carbon emissions reduced by approximately 8.67 tCO ₂ e per year

Evaluation on social impact from solar power promotion in community in 2020-2023

- 500 households or 15.53 % of households in Yang Hak sub-district, Pak Tho District, Ratchaburi Province benefited from the project
- The solar-powered water pumps contributed about 7,000 cubic meters of water for agricultural purposes.

*Based on TGO's calculation methodology: Gasoline combustion of not-moving engine releases 2.1896 kg of carbon dioxide per liter (kgCO₂e)

Low Emission Support Scheme (LESS)



Target:



TGO's certification on emission reduction



Performance:



The company was certified for the emission reduction of **11.527** tCO₂e.

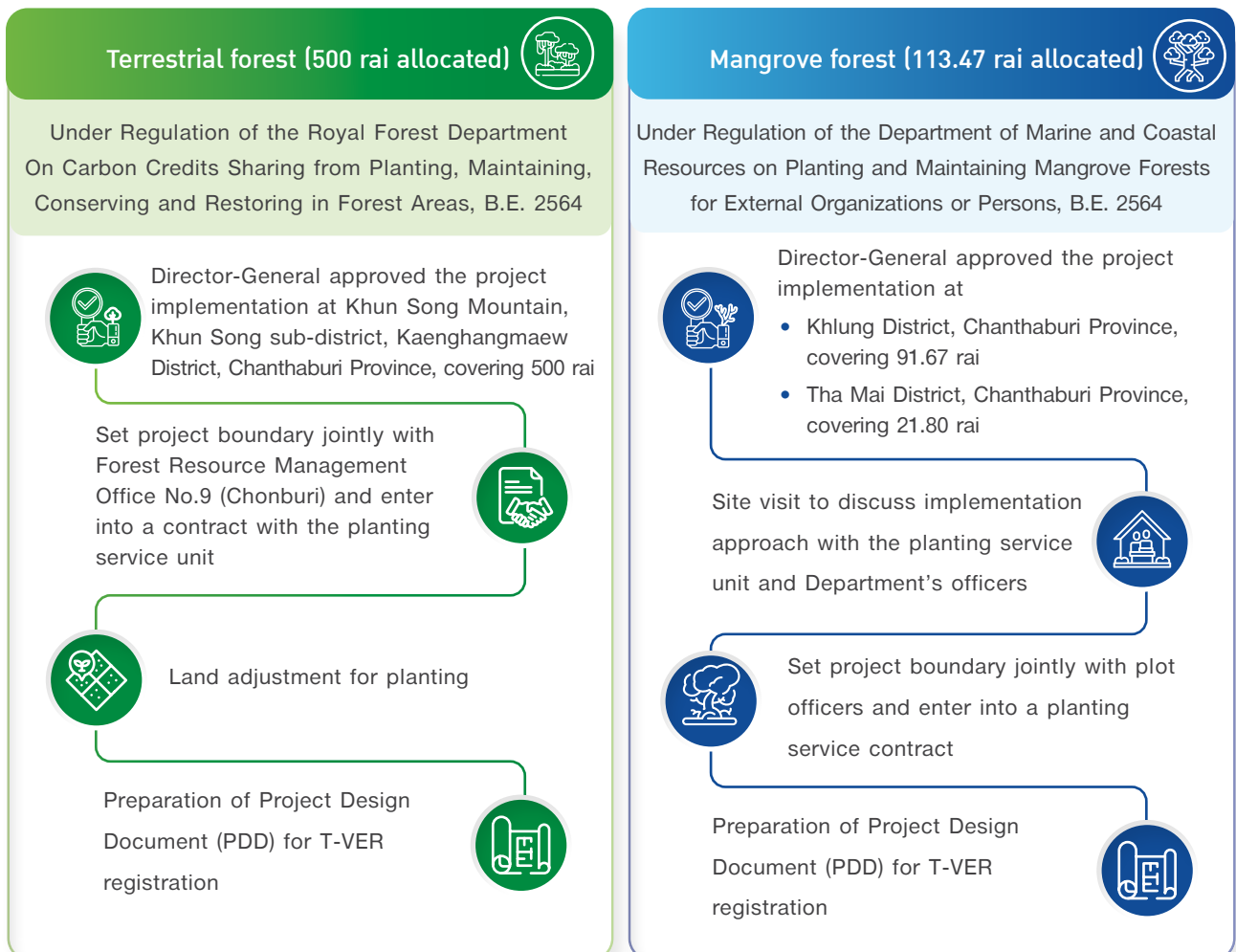
In 2022, Thailand Greenhouse Gas Management (Public Organization) certified for the emission reduction of 11.527 tCO₂e. The certification was awarded to the company's two community projects that supported renewable energy generation under the Low Emission Support Scheme (LESS) scheme. The projects are:

- 1) Solar-power promotion at Ban Hua Ha, Mae Hong Son Province, reducing emissions by 4.859 tCO₂e
- 2) Community Energy Project at Yang Hak Sub-district, Pak Tho District, Ratchaburi Province, reducing emissions by 6.668 tCO₂e

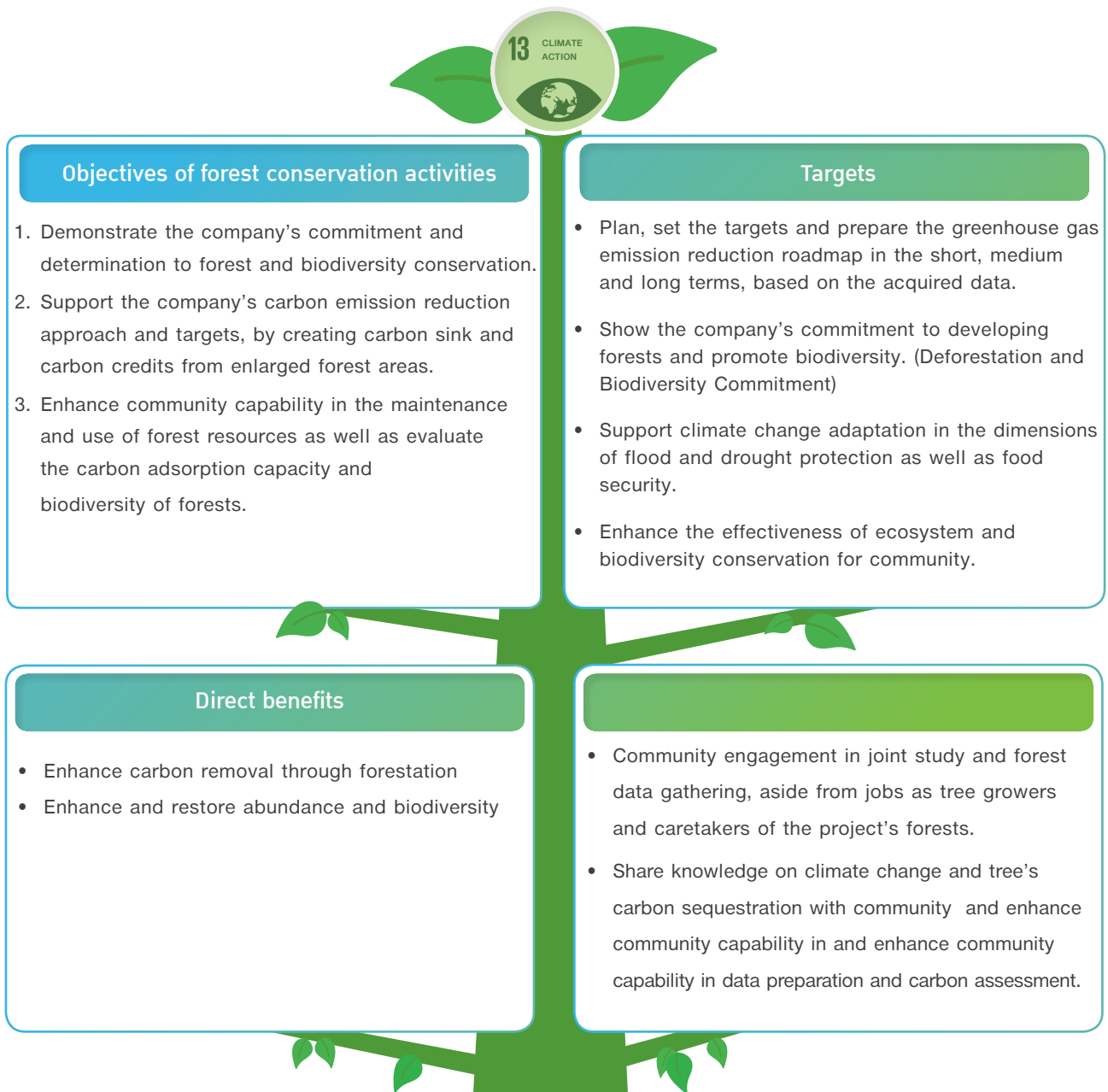
Forestation for carbon sink creation and carbon credits

RATCH initiated 2 forest conservation projects to enhance biodiversity and create carbon sinks. The first project was launched in cooperation with the Royal Forest Department to grow trees in 500-rai terrestrial forest. The second project involved the forestation on 113.47-rai mangrove forest allocated by the Department of Marine and Coastal Resources. Both projects are located in Chanthaburi Province. The company plans to register both under Thailand Greenhouse Gas Management (Public Organization)'s T-VER scheme, for the certification of 20-year carbon credits. The Company targets to cover 50,100 rai of forest areas for its carbon sink creation initiative.

Performance in 2022

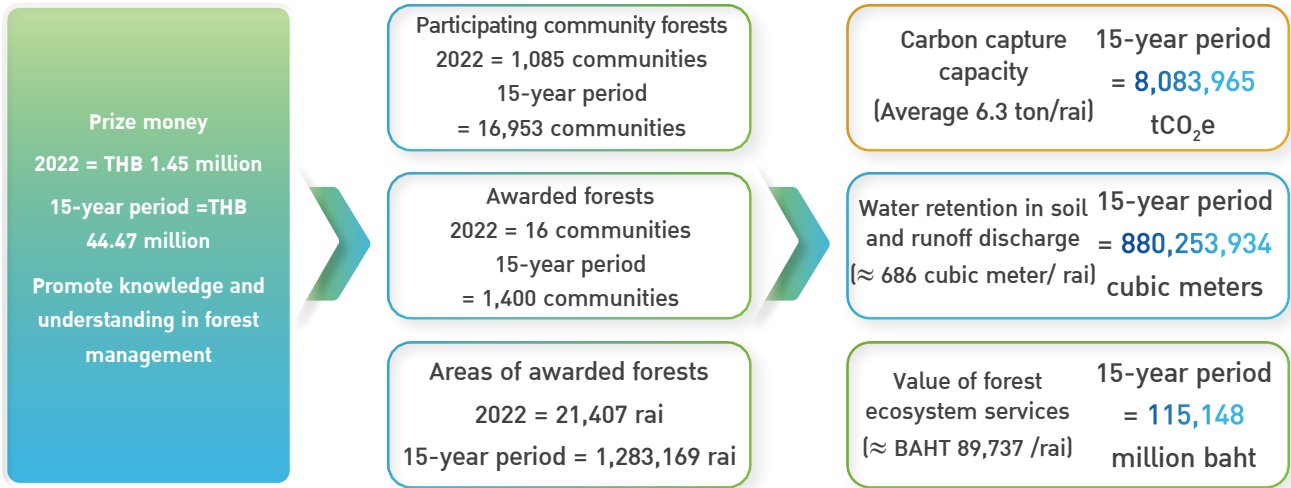


In addition, RATCH signed a memorandum of understanding with Mae Fah Luang Foundation on “the Forest Carbon Credits Management for Sustainable Development Project”. The project promotes the coexistence of community and community forests through a balanced/sustainable approach in using forest resources. The community forest will participate in Thailand Voluntary Emission Reduction (T-VER) scheme. Under this initiative, the community will have strong mechanism in maintaining forest resources and the environment, gain knowledge in evaluating and following up on forest growth and biodiversity and enjoy job opportunities, for mutual growth and sustainability. RATCH provided supports to community forests in the North and the Northeast, covering 11,000 rai. The Project Design Document (PDD) for T-VER registration is slated for completion within 2027.



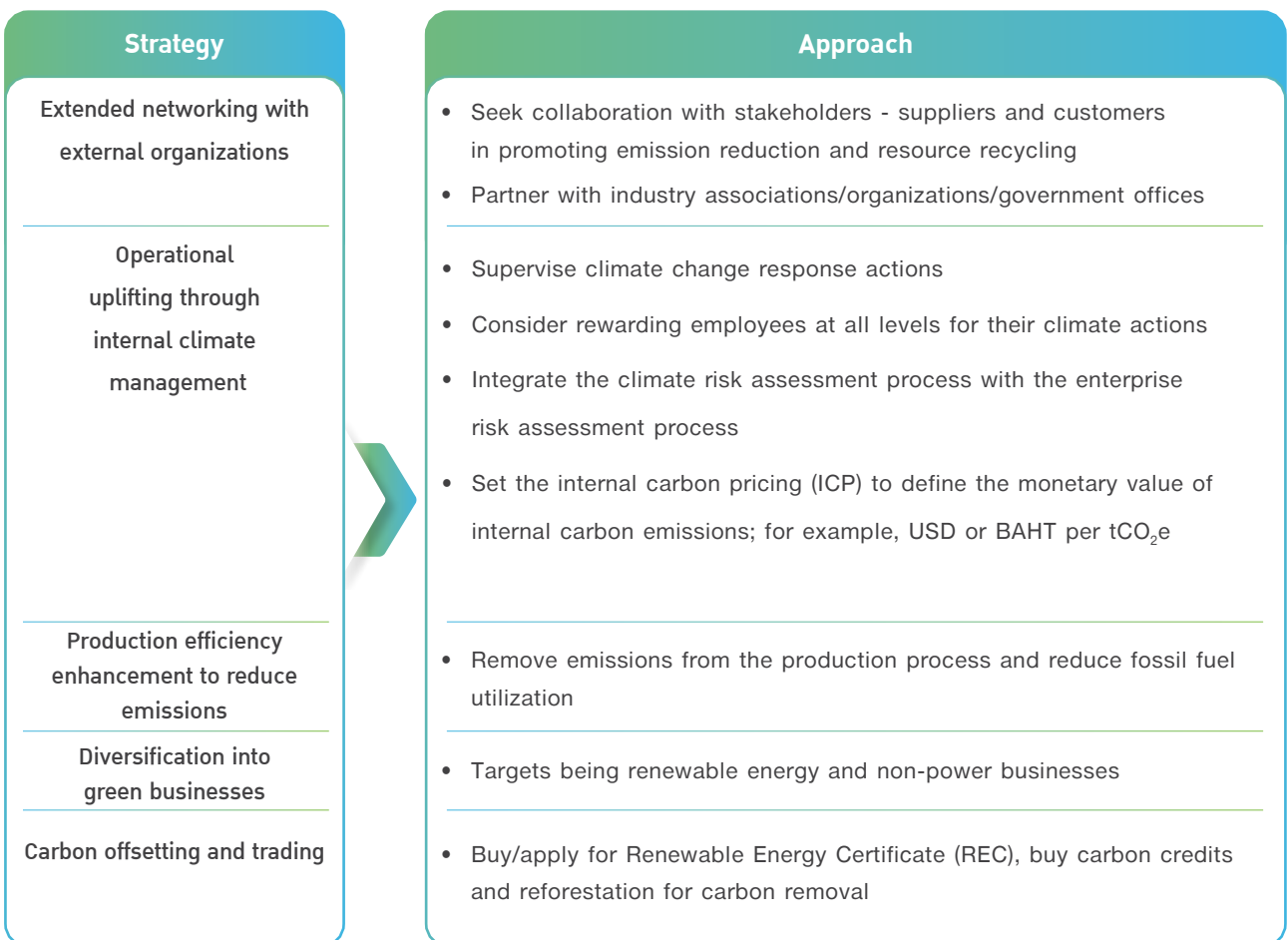
Promote the maintenance of community forest for carbon sequestration

RATCH maintains its commitment to supporting community forest activities nationwide through the “Love the Forest and the Community Project”. Throughout the past 15 years, with the company’s supports communities have strengthened their forest management capability and the benefits include carbon capture, water retention in soil and values to the ecosystem.



Emission reduction roadmap and targets





RATCH collected data to assess risks, opportunities and all possible impacts. The data and the company's actions have been processed to shape the emission reduction approach in support of the Climate Change Strategy and the target to achieve carbon neutrality in 2050.



Emission reduction approach to achieve carbon neutrality in 2050

Year	Production efficiency enhancement	Green business	Internal/external engagement	Carbon offsetting/trading	Targets
2023 - 2030				✓	GHG intensity reduction target setting
	✓				Production efficiency enhancement (Improvement in production process)
				✓	Study capability to achieve the target of carbon neutrality in 2050
	✓				Increasing internal use of renewable energy
				✓	Studies on carbon tax scheme, and impact and opportunity towards the company
		✓			Increases renewable capacity to 25% of the total
				✓	Reporting of all projects' Scope 3 emissions
			✓		Implements forestation or natural carbon capture activities
	✓				Feasibility study on CCS and hydrogen application
	✓			Increases investment in low-carbon business and BCG	
2031 - 2050				✓	Setting of renewable energy capacity target at 40% of total capacity
				✓	Setting GHG intensity reduction target
	✓				Enhancing production and energy efficiency, and increasing internal use of renewal energy
	✓				Prepares readiness for energy transition into using of hydrogen energy
				✓	Keeps follow up performance of CCUS technology used in the generation process
			✓		Considers carbon offsetting (by carbon credit initiatives and REC)
		✓		Increases investment in low-carbon business or BCG	

GHG Emission Disclosure

Disclosure channel	Target groups	Results
Sustainability Report preparation under GRI standard		Shareholders, investors, stakeholders and the general public Assurance of Sustainability Report 2022 and key indicators in environmental and social dimensions in accordance with GRI reporting standards 2021
Stock Exchange of Thailand's sustainability assessment		Shareholders, investors, stakeholders and the general public Being a member of Thailand Sustainability Investment (THSI) in Group 2 category for companies with THB 30,000 - THB 100,000 million in market capitalization million for the 8th consecutive year
Response to sustainability questionnaire of S&P ESG Indices		Investors and stakeholders RATCH was selected to complete S&P ESG Indices questionnaire for the second year and the evaluation score was 5% higher than in 2021.
Response to Carbon Disclosure Project questionnaire		Shareholders, investors and stakeholders RATCH joined Carbon Disclosure Project (CDP) in disclosing its operations for climate change and water security. The disclosure contained principal data on risk and impact assessment as well as targets on climate change and water utilization responses.



RATCH received honorary “Sustainability Disclosure Award 2022” from Thaipat Institute for the fourth consecutive year, recognized for the Completeness, Credibility and Communication of its publicly-disclosed Sustainability Report based on the Ceres-ACCA criteria.

Environmental Impact Management



RATCH has deployed sustainable approaches when it comes to environmental management, to ensure the maximum efficiency and benefits of resource utilization and to prevent impacts and harms on the environment and natural resources. The environmental quality monitoring has been in place to control pollutants and waste from the production. On top of that, the Company aims to completely follow environmental rules and laws and exceed regulatory requirements.

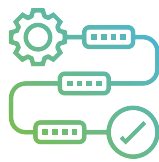
Sustainable environmental management principles

Analyze possible environmental impacts



Always be mindful of possible impacts from development activities and the implementation and seek solutions in advance in line with the “Eco-Development” approach through, for example, project environmental impact

Clearly specify the resource management and utilization plan



Specify and identify resources in use and plot the utilization plan accordingly to the organization’s capabilities for optimal benefits, giving the priority to the long-term benefits of such resources

Utilize resources accordingly to conservation principles



Use resources sensibly, considering the entire process of storage, preservation, maintenance, development and disposal as well as waste recycling via an efficient and reasonable method.

Monitor and assess impacts for a review on measures and waste control



Deploy efficient tools and technology in the production process to avoid causing pollution; and establish strict control and examination measures as well as appropriate and academically-viable disposal methods.

Realizing that electricity generation, our main business, is a resource-consuming process that may cause risks and impacts on the environment and nearby community, RATCH has established the environmental management system to minimize the likelihood of risks and impacts.

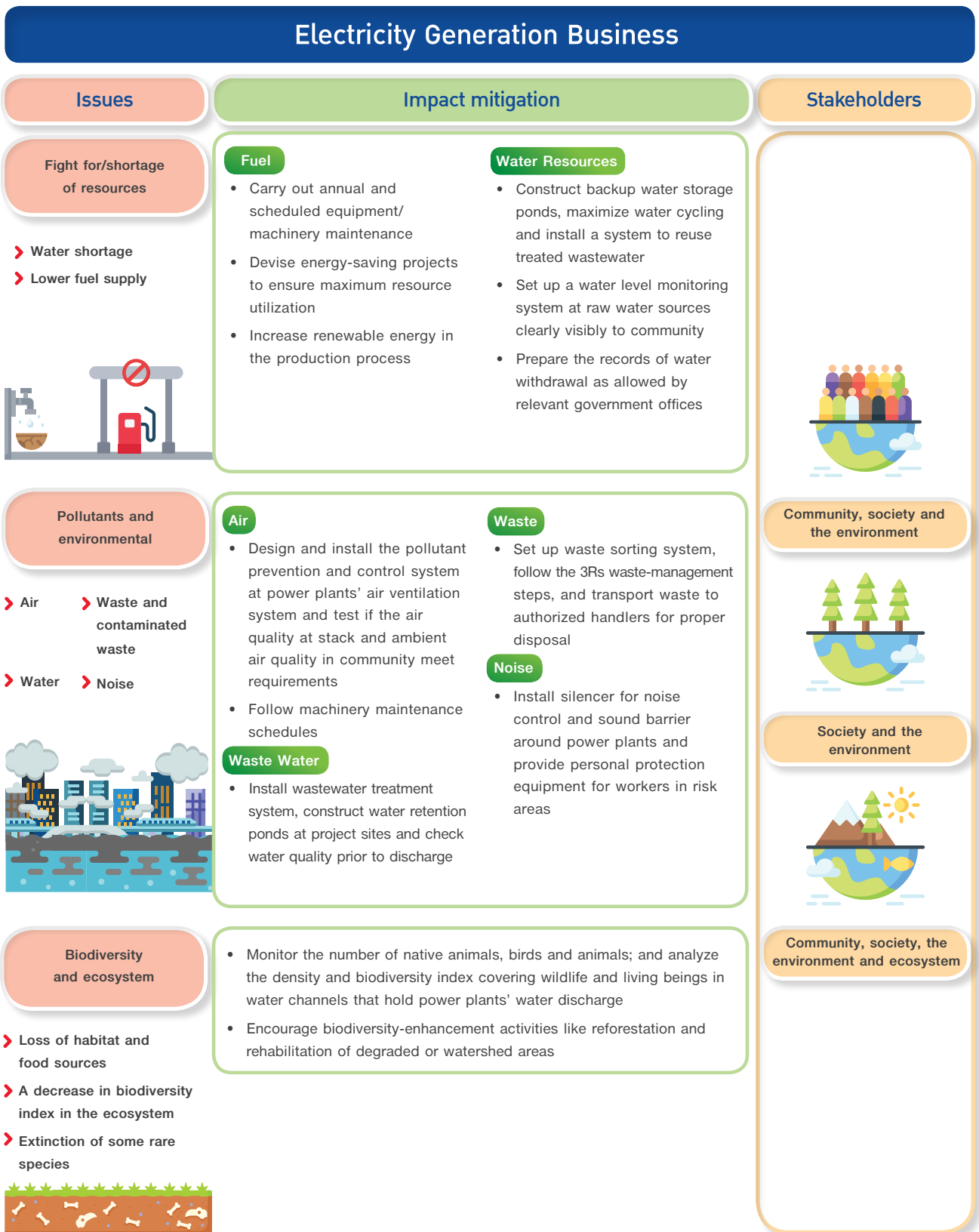
On environmental supervision, RATCH has shaped the Code of Conduct, the Environmental Policy and the Corporate Sustainability Policy based on environmental management laws, rules and regulations and international standards. All practices are shared with the businesses controlled by the Company, to streamline the operational approaches and organizational goals.

Structure of Environmental Supervision

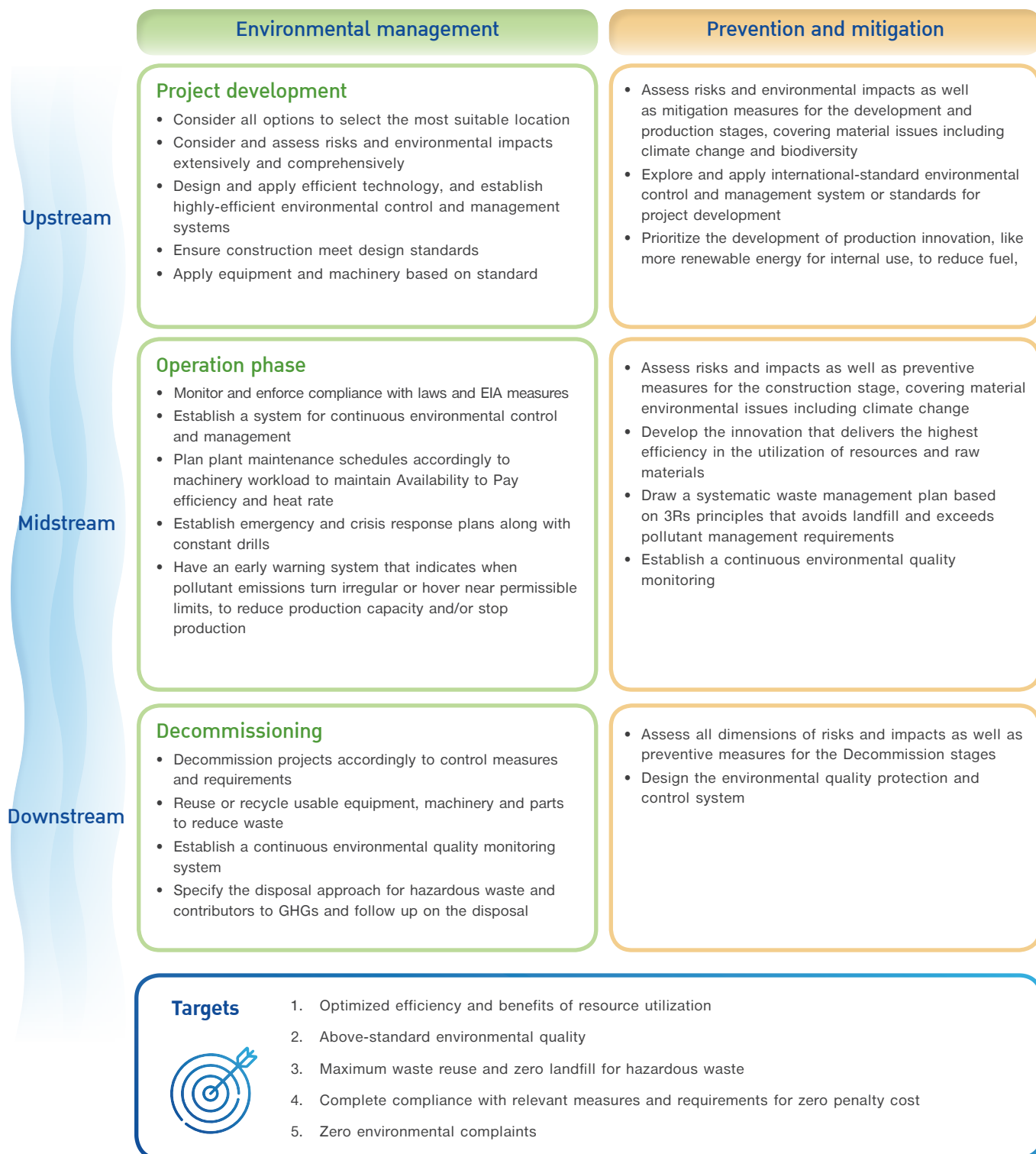


Environmental Management Process

The 8 RATCH-controlled power plants, in Thailand and overseas, (contributing 92.11% of total revenue in 2022) give importance to the management of possible impacts from the operations. They assess and make forecasts on possible impacts to work out resource utilization and solutions to reduce and prevent possible impacts as well as correctly tackle remaining pollutants.



In the environmental management process, RATCH emphasizes resource optimization from upstream to downstream as well as prevention of environmental impacts from the design, construction, production and maintenance stages to decommissioning. The process makes sure that the electricity, the Company's main product, is produced by the process friendly to the environment and community. The process also reflects the Company's responsibility for its products and supports SDG 12: Ensure sustainable consumption and production patterns (Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse).

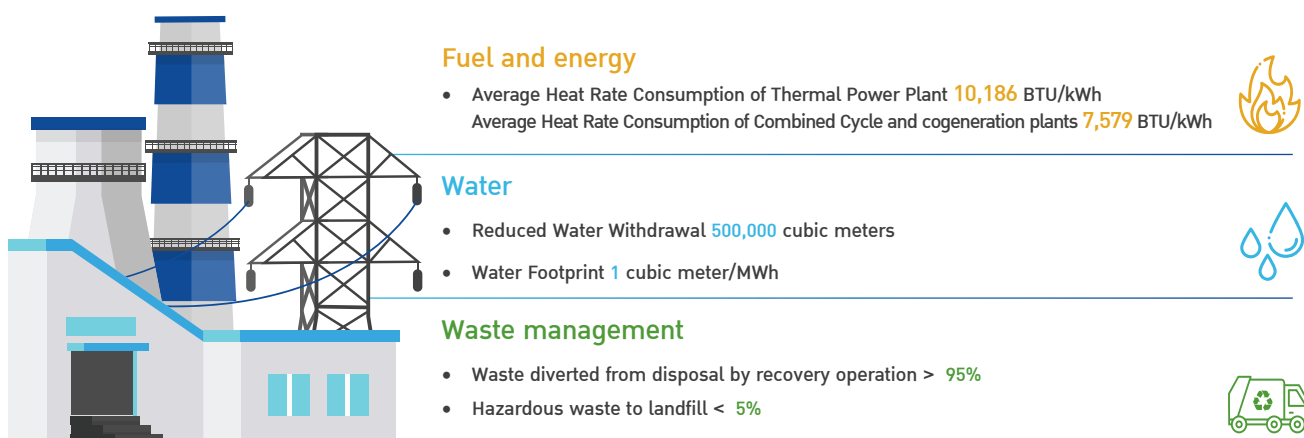


Performance in 2022

Resource and energy consumption

Electricity generation, the Company's principal business process, requires resources from natural gas, fuel oil and water to other necessary supports. For this process, RATCH and all power plants under our control have set the resource and energy consumption targets, to gauge the power plants' resource and waste management efficiency.

Resource and energy consumption targets



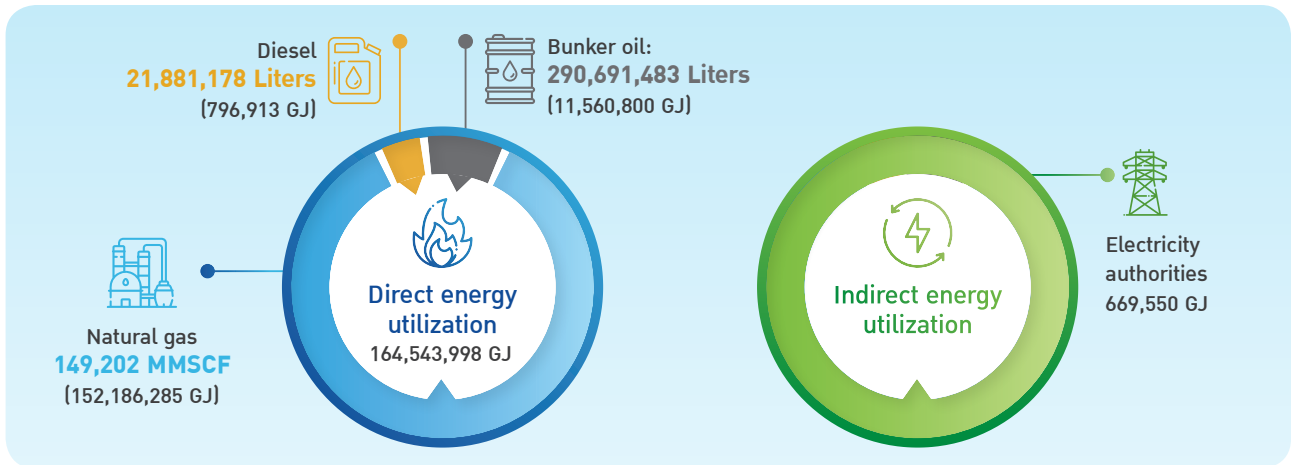
Fuel and energy

All 6 RATCH-controlled power plants have 4,089 MW in combined installed capacity or 83.81% of total revenue in 2022. All use natural gas as the primary fuel source, except Ratchaburi Power Plant (with installed capacity of 3,645 MW or 72.25% of 2022 revenue) which was designed to work primarily on natural gas and also on diesel and bunker oil as the secondary fuel source. For national energy security, the power plant uses diesel or bunker oil when natural gas supply from Myanmar is stopped following maintenance and other necessities. The fuel switch follows EGAT National Control Center's order. In 2022, the center ordered Ratchaburi Thermal Power Plant Unit 1 and 2 with 735 MW capacity each to use bunker oil.

Indicator	Unit	2022	2021	2020
Volume of natural gas	million cubic feet	149,202	121,482	129,310
Volume of bunker oil	liter	290,691,483	161,121,423	0
Volume of diesel	liter	21,881,178	9,244,423	2,020,571
Net generation output	megawatt-hour	18,488,776	14,625,418	14,933,403
Consumption of renewable energy	megawatt-hour	13,860	2,858	0

Note: Note: - In 2022 are reported the consumption and performance of Ratchaburi Power Plant, Berkprai Cogeneration Power Plant, Nava Nakhon Generating Power Plant, Ratch Cogeneration Power Plant, Nexif Ratch Energy Rayong Power Plant and Sahacogeneration Power Plant (Chonburi)
 - In 2020 - 2021 are excluded Sahacogeneration Power Plant (Chonburi) and Nexif Ratch Energy Rayong Power Plant.

Heat Rate and Energy Consumption of Power Plant in Thailand 2022



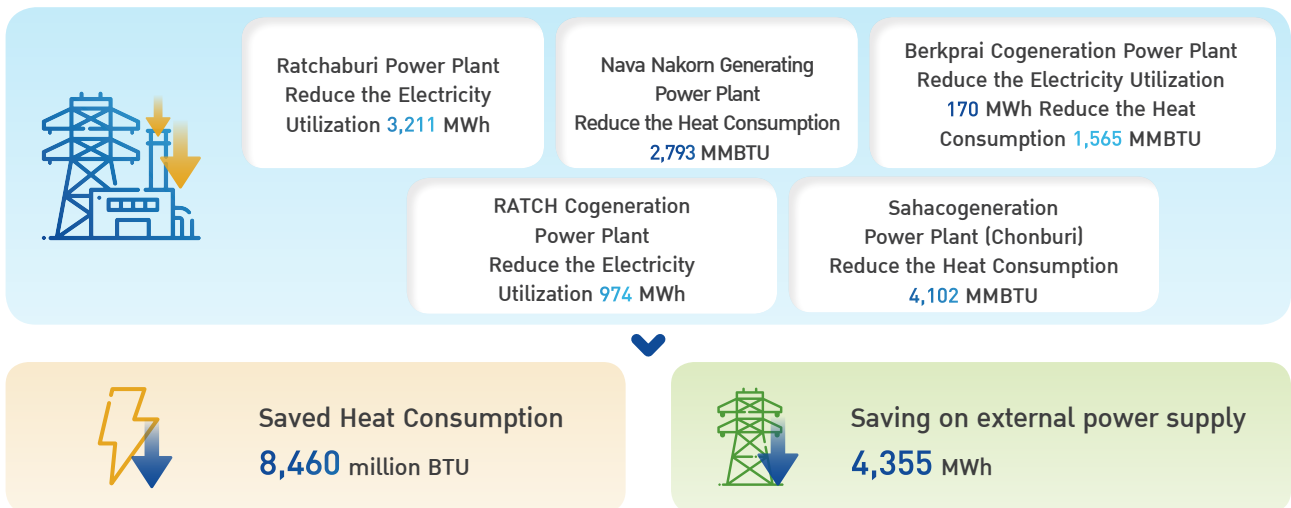
Total energy utilization (direct and indirect): 165,213,548 GJ

Production process improvement to reduce fuel and energy utilization

The generation efficiency of RATCH’s controlled power plants in 2022 averaged 47.65%, in line with the performance target.

Reflecting the emphasis on resource optimization, RATCH-controlled power plants have invented and modified machine operations as well as enhanced machinery and equipment efficiency, aiming to reduce fuel and energy utilization and raise economic benefits through a lower production cost. The attempt will also support the sustainable development goal on sustainable consumption. Activities in detail appear in “Enhancement of Emission Reduction Efficiency Section page 106”.

Volume of saved fuel and energy following improvements to production process

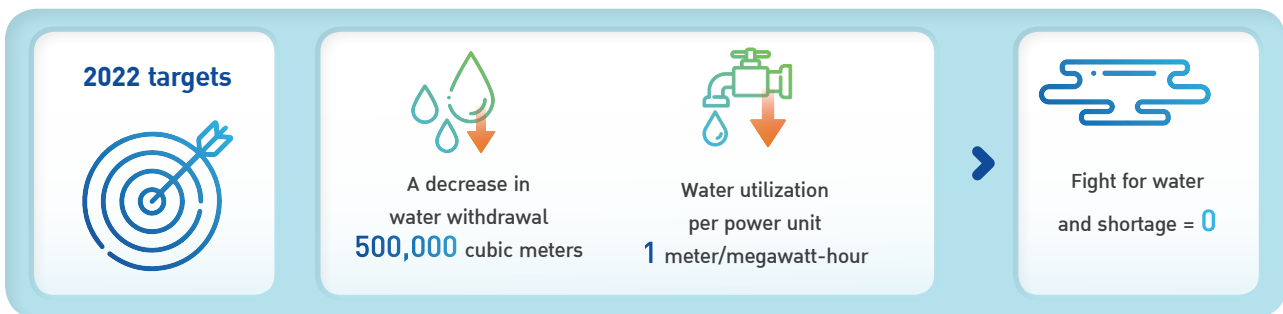


Total expense saving after improvements to production process: 16,950,448 Baht

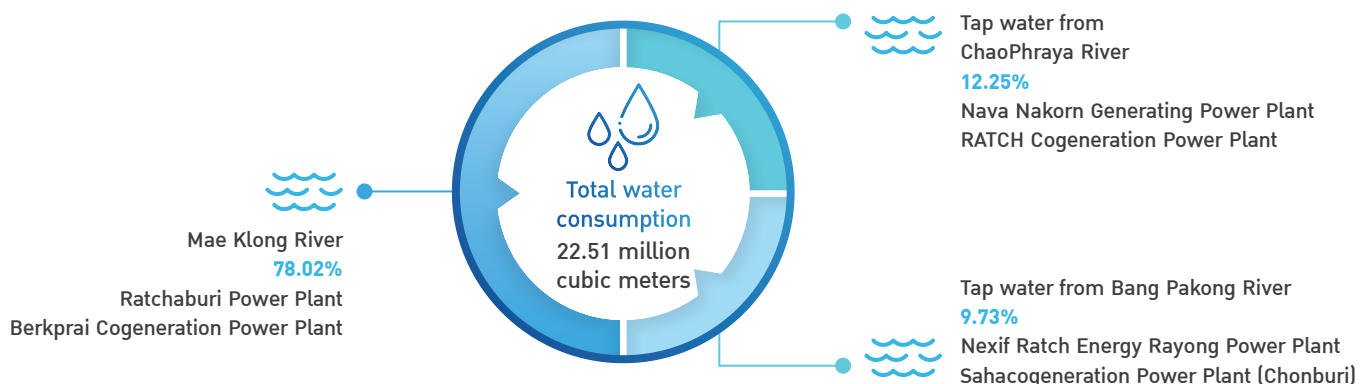
Water resources

Raw water is an essential resource in electricity generation. Most of RATCH's assets are thermal and combined-cycle power plants, accounting to 41.78%, that demand a massive volume of water. RATCH has thus emphasized the efficiency in water management, to raise the water utilization per power unit rate and increase the reuse rate. Meanwhile, we aim to decrease water withdrawal, to prevent impacts on water shortage and a possible fight with community.

Water resource management targets and approach



Water utilization varies accordingly to power plants' installed capacity: the higher installed capacity, the higher water demand. All 6 RATCH-controlled power plants in Thailand, contributing 83.81% of revenue, use raw water from 3 sources which are the Mae Klong River Basin, the Chao Phraya River Basin and the Bang Pakong River Basin. All 3 sources mainly serve agricultural, irrigation and consumption purposes.



Water stress analysis

The analysis and ranking by World Resources Institute (WRI)'s Aqueduct Water Risk Atlas and the WWF (Water Risk Filter) shows a low water stress level for the Mae Klong River Basin and a high stress level in the Chao Phraya River Basin and the Bang Pakong River Basin.

Low stress level
(10-20%)

- Ratchaburi Power Plant
- Berkprai Cogeneration Power Plant

High stress level
(41-80%)

- Nava Nakorn Generating Power Plant
- RATCH Cogeneration Power Plant
- Nexif Ratch Energy Rayong Power Plant
- Sahacogeneration Power Plant (Chonburi)

Water withdrawal and power generation based on water stress levels

Water source	Water stress level			Water utilization per power unit (cubic meter/megawatt-hour)	Power generation based on water stress levels
	Low (10-20%)	Medium (21-40%)	High (41-80%)		
Mae Klong	Ratchaburi Power Plant	-	-	1.13	79.60
Mae Klong	Berkprai Cogeneration Power Plant	-	-	1.49	3.24
Tap water from Chao Phraya River	-	-	Nava Nakorn Generating Power Plant	1.55	6.22
Tap water from Chao Phraya River	-	-	RATCH Cogeneration Power Plant	1.36	3.88
Tap water from Bang Pakong River	-	-	Nexif Ratch Energy Rayong Power Plant	1.33	1.62
Tap water from Bang Pakong River	-	-	Sahacogeneration Power Plant (Chonburi)	1.78	5.45

Measures to tackle shortage risks

RATCH's power plants, particularly those located in the Chao Phraya River Basin and Bang Pakong River Basin, have ensured continuous monitoring of water levels in raw-water sources and reinforced the compliance with preventive and mitigation measures as specified in the projects' EIA. The goal is to monitor and watch out for any issues involving water shortage and a fight with community and farmers for water, that may send impacts on the economy and community livelihood. Constant discussions with water producers and distributors have taken place, along with the follow-up on their water source management plans.

Through long-term contracts, Nava Nakorn Power Plant and RATCH Cogeneration Power Plant use tap water made from water in the Chao Phraya River Basin while Sahacogeneration Power Plant (Chonburi) and Nexif Ratch Energy Rayong Power Plant use tap water made from water in the Bang Pakong River Basin. These two river basins show a high stress level (41-80%). To manage supply-related risks, the tap water producer and distributors are required to locate a secondary and emergency water source in case of drought or shortage in the main sources. That is to ensure a sufficient water supply to the power plants. In addition, each plant has established additional measures as follows:

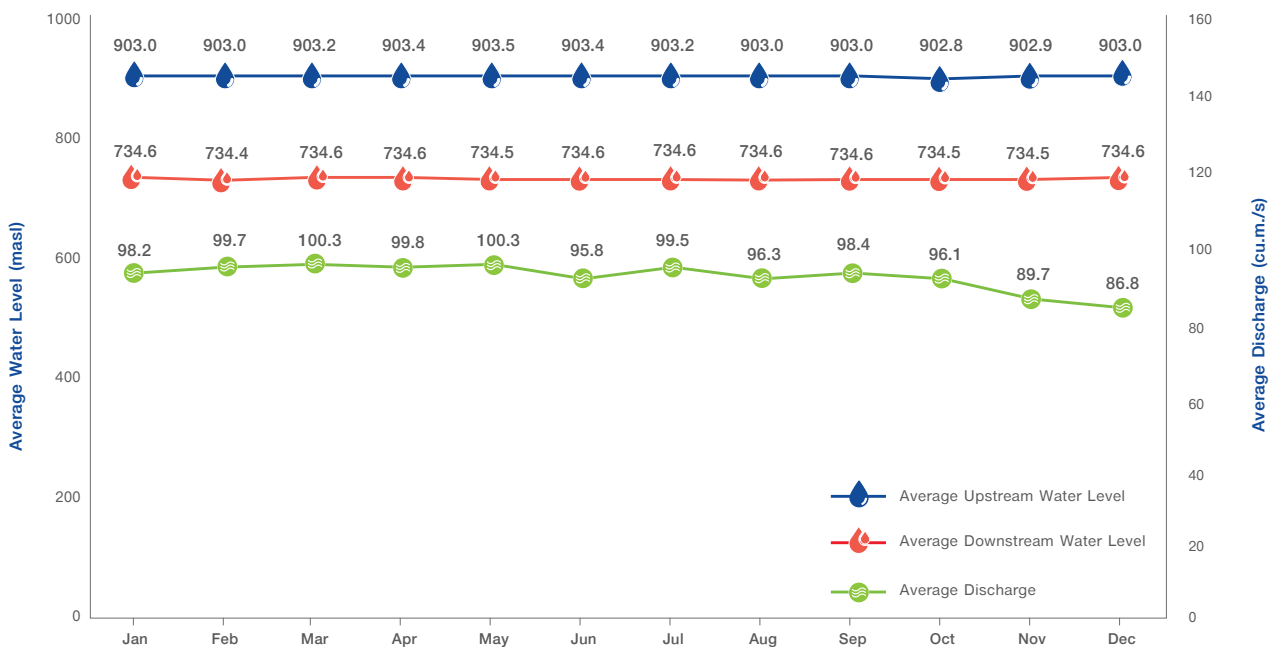
1. Construct backup water storage ponds to address water consumption for at least 10 days.
2. Install the water quality improvement system to ensure efficient utilization and reduce water loss.
3. Maximize water recycling in the cooling system.
4. Consider additional approaches to optimize water utilization efficiency and recycling, like drawing rainwater for production or reusing treated water for equipment washing and tree watering.
5. Regularly check pipelines and immediately fix leakage, to prevent water loss.
6. Organize projects to raise awareness and campaign for efficient water utilization.

Hydroelectric power plants' water management

In 2022, RATCH acquired a 90% stake in Fareast Renewables Development Pte. Ltd., which raised its holding interest and control in 180-MW Asahan-1 Hydroelectric Power Plant. Located on the Asahan River in North Sumatra, Indonesia, it has been operational since January 2011 with the capacity of 1,175 MWh per year and sells electricity to PLN, Indonesia's national electricity utility under a 30-year contract (2011-2040).

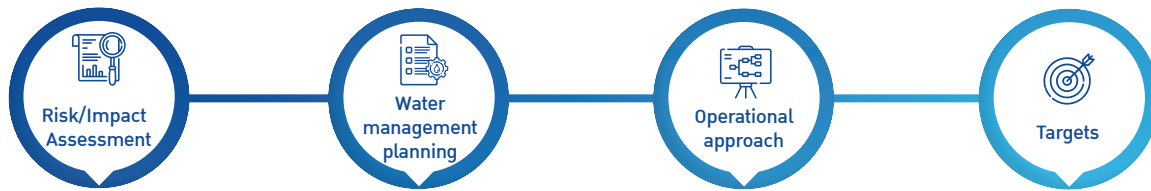
Asahan-1 is a run-of-river hydroelectric power plant, depending entirely on seasonal water that runs through the project. Without water storage, the power plant ensures a balance of water inflow and outflow throughout the operational period. While inflows are used to generate electricity, extra volume is released via spillways. The project gives importance to the maintenance of upstream water level and flow rate, to ease impacts on the environment and upstream and downstream community. This is to ensure the operations will not disrupt water consumption or cause shortage and fight in the downstream area. The renewable power plant enhances the electricity stability of North Sumatra. In the past year, it received no complaint on water-related conflicts or fight.

Correlation of flow rate and upstream/downstream water levels



Systematic water management process

Aside from adhering to the measures aimed at reducing and preventing water-related issues, RATCH emphasizes a systematic water management system and the planning of water utilization in the production process. The focus is placed on a cut in utilization, an increase in reuse, recycling and avoidance of waste creation in line with the 3Rs principles. The goal is to enhance water utilization efficiency, reduce loss, slash raw water demand and reduce the volume of water discharge.



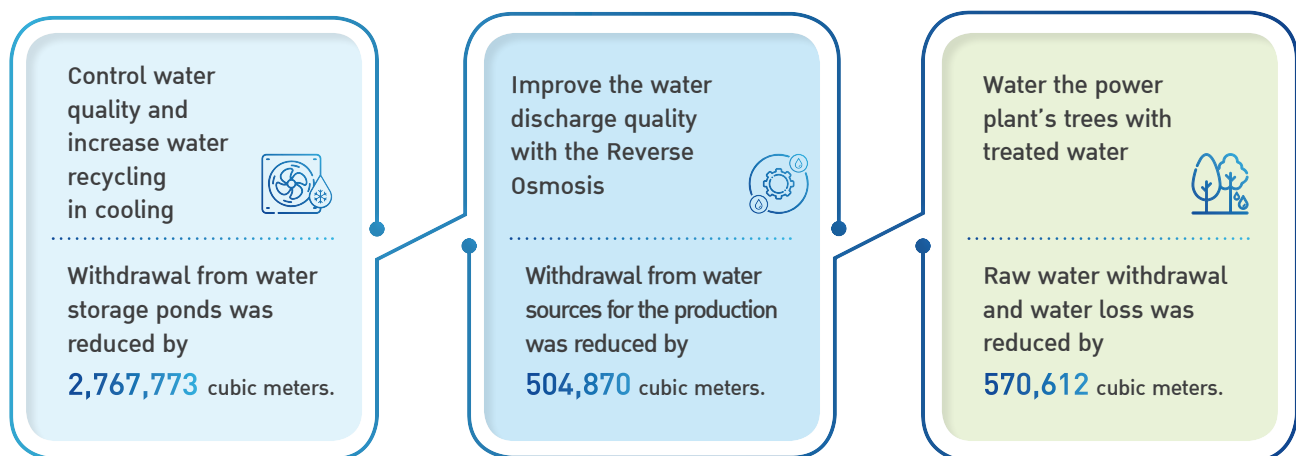
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| <ul style="list-style-type: none"> • Drought/insufficient supply for the production • Fight for water • Discharge of contaminants, affecting usability | <ul style="list-style-type: none"> • Plan withdrawal in accordance with production plans • Improve/study/invent the equipment or production process that reduces water utilization • Establish standardized water treatment and quality monitoring systems | <ul style="list-style-type: none"> • Switch from the alkaline system to the acidic system of cooling system in order to optimize water recycling • Apply the Reverse Osmosis system in treating wastewater and use treated water in the production • Treat unused water and check the quality of discharge against • Reuse the treated water in Tree watering and green area of the power plant | <ul style="list-style-type: none"> • Reduce withdrawal of raw water • Reduce wastewater • Reuse treated and reusable water • Receive zero complaint or conflict with community |
|---|---|---|--|

Water utilization in power generation in 2022

Power plant	Water source	Raw water (million cubic meter)	Water utilization per power unit (cubic meter/megawatt-hour)	Water discharge			Net water utilization (raw water - water discharge) (million cubic meter)
				Volume (cubic meter/megawatt-hour)	(%) of utilized raw water	Discharge channel	
RGCO	Mae Klong	16.67	1.13	1.60	9.59	Klong Bang Pa	15.07
BPC	Mae Klong	0.89	1.49	0.27	29.98	Mae Klong River	0.63
NNEG	Tap water coming from Chao Phraya River	1.78	1.55	0.12	6.71	Central Waste Water Treatment	1.66
RCO	Tap water coming from Chao Phraya River	0.97	1.36	0.11	11.21	Sent to other organizations for utilization	0.86
NRER	Tap water coming from Bang Pakong River	0.40	1.33	0.07	17.62	Klong Chang Tai	0.33
SCG	Tap water coming from Bang Pakong River	1.79	1.78	0.54	29.94	Sahapat Industrial Park	1.26

Remark; RGCO = Ratchaburi Power plant RCO = RATCH Cogeneration
 BPC = Berkprai Cogeneration NRER = Nexif Ratch Energy Rayong
 NNEG = Nava Nakorn Generating Power plant SCG = Sahacogeneration (Chonburi)

Water use efficiency



Withdrawal from power plants' water storage ponds was saved by **3,843,225** cubic meters or equivalent.



Target: **500,000** cubic meters

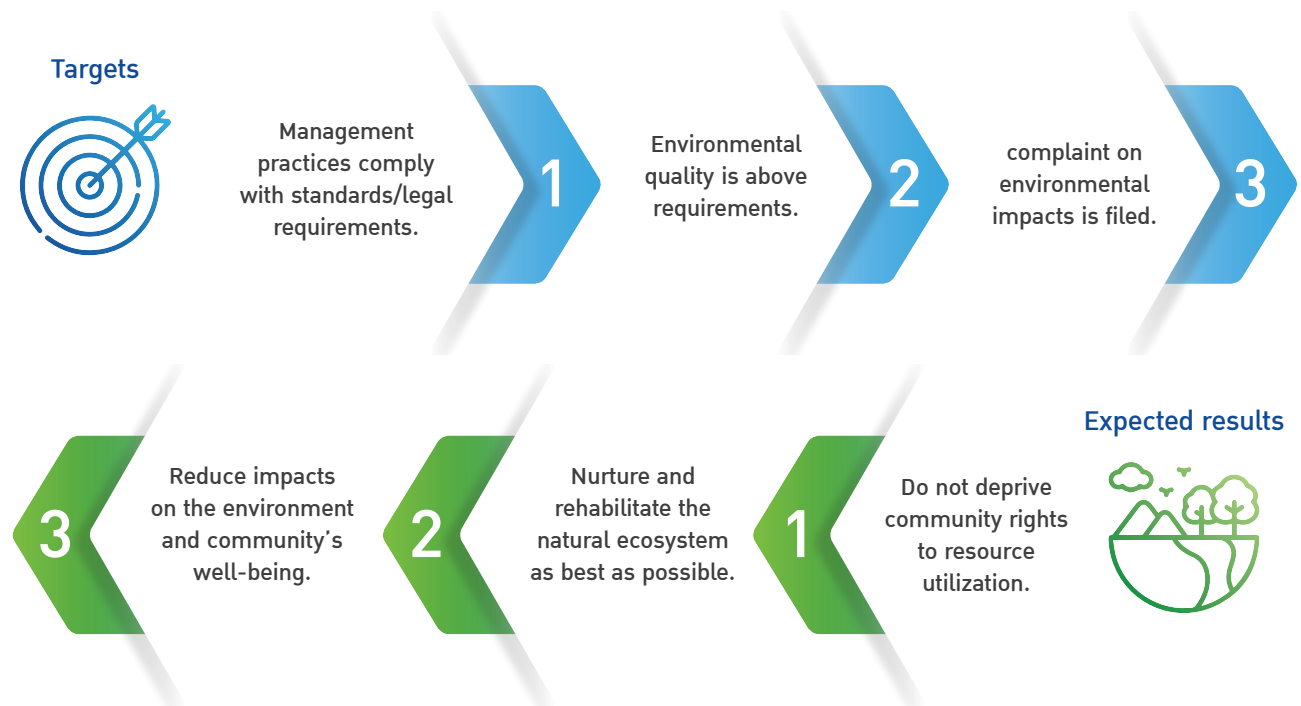
Cycle of concentration in cooling water system

All 6 RATCH-controlled power plants in Thailand emphasize the efficiency and optimization of the water management system. They have continually studied and explored the means to reduce the production process' water use and enhance the efficiency of water cycles in the water-intensive cooling system. The water cycles in the cooling system have been optimized as best as possible, to reduce raw water inflows and unnecessary water discharge. The performance in 2022 is as follows:

Project	Province	Target water use (cycle)	Average water cycles in 2022
Ratchaburi Thermal Power Plant	Ratchaburi	4-6	2.6
Ratchaburi Combined Cycle Power Plant		4-6	4.8
Berkprai Cogeneration Power Plant		5	3.7
Nava Nakorn Generating Power Plant	Pathum Thani	5	4.1
RATCH Cogeneration Power Plant		6	7.3
Nexif Ratch Energy Rayong Power Plant	Rayong	6	6.7
Sahacogeneration Power Plant (Chonburi)	Chonburi	5-13 (Set 1)	7.8
		3-8 (Set 2-3)	4.1

Environmental Quality Management

To minimize impacts from power generation, all power plants looked into the matter from the designing stage. High-efficiency and internationally-recognized pollution control and prevention systems have been chosen, involving the water contaminant treatment system, the air pollution treatment system, The noise pollution prevention system and the waste management system. On top of that, RATCH has completely followed all EIA measures and kept all elements of environmental quality within regulatory requirements and industrial standards. The ISO 14001:2015 environment management standard has been adopted to uplift the management efficiency to the level that leaves no harm on community, society and the ecosystem.



Power plants' environmental quality management system



Air quality

1. Install pollutant control and elimination system as well as monitoring system
2. Install emission monitoring system at the top of stacks
3. Measure air quality in affected, sensitive and community areas



Water quality

1. Design and install water treatment system for different types of wastewater
2. Treat/control the quality of wastewater and check water discharge quality
3. Reuse treated water
4. Monitor water quality in natural water channels



Waste management

1. Outline maintenance plans and the plans to reduce waste at the source
2. Maximize reuse or recycling
3. Explore appropriate disposal means and say no to landfills

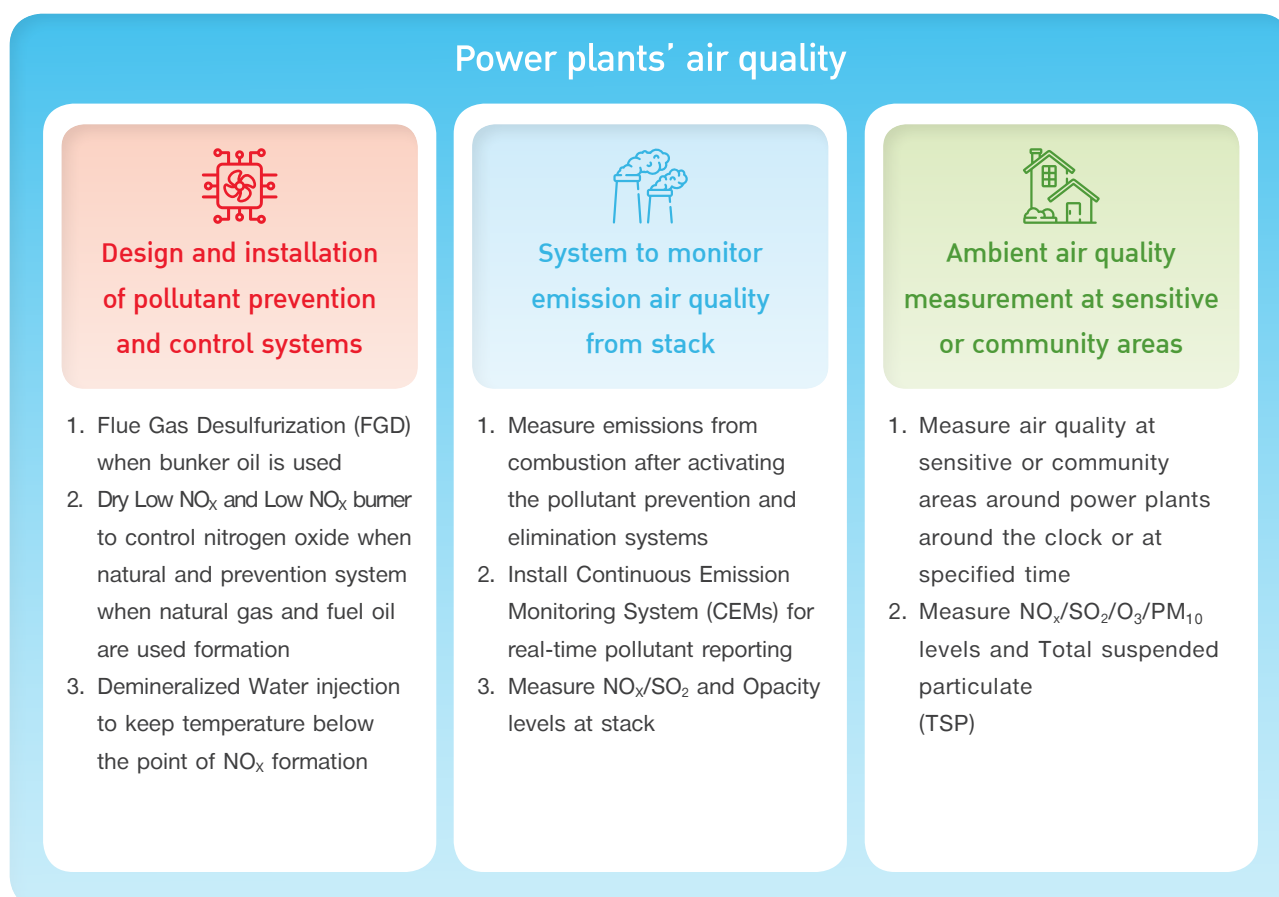


Noise pollution

1. Install noise-reduction devices at the source
2. Install noise barriers
3. Install warning signs at high noise areas
4. Check noise level in affected community areas

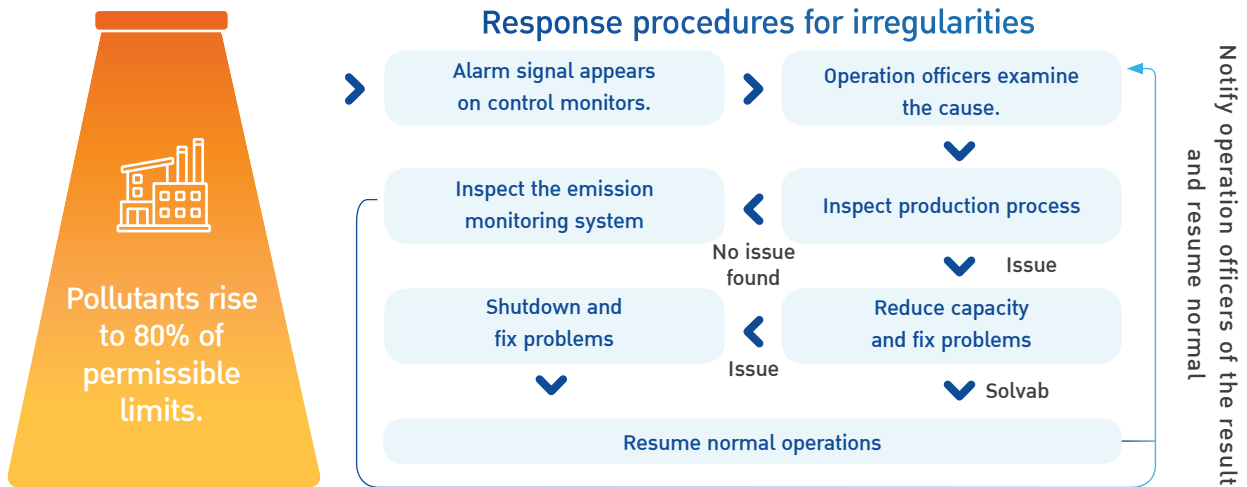
Air quality management

Thermal and combined cycle power plants need a system to emit contaminated combustion air to the atmosphere. It is thus necessary to tackle significant pollutants – sulfur dioxide and nitrogen oxide – and strictly keep them within legal emission permissible limits.



Preventive measures against irregularities

To prevent pollutants from exceeding permissible limits, all RATCH-controlled power plants have installed early-warning systems and established response procedures in case pollutants at stack rise to 80% of permissible limits. The preparations enable the power plants to operate without causing impacts on the environment and community or breaching legal limits. By doing so, they show responsibility for their products.



Power plant air quality measurement

In 2022, RATCH controls 6 power plants which contribute 83.81% of total revenue. The power plants have continually measured the pollutant intensity at stacks. At Ratchaburi Thermal Power Plant where Unit 1 and Unit 2 were ordered by the Electricity Generating Authority of Thailand to operate with bunker oil in light of natural gas price hikes, the intensity remained within permissible limits. Notably, the Continuous Emission Monitoring System is verified for accuracy and precision by an external verifier.



Power plant	Average pollutant concentration				Secondary energy source
	NO _x (ppm)		SO ₂ (ppm)		
	Natural gas	Fuel oil	Natural gas	Fuel oil	
Ratchaburi Thermal Power Plant	25.95	102.28	0.43	192.43	bunker oil
Ratchaburi Combined Cycle Power Plant	31.63	114.40	2.54	30.62	diesel
Target (Not exceeding legal limits)*	120	180	20	320	-
Berkprai Cogeneration Power Plant	26.15	-	0.25	-	None
Nava Nakorn Generation Power Plant	30.6	-	4.80	-	None
RATCH Cogeneration Power Plant	44.5	-	<1	-	None
Nexif Ratch Energy Rayong Power Plant	44.7	-	<2	-	None
Target (Not exceeding EIA-specified limits)*	60	-	10	-	-

Power plant	Average pollutant concentration				Secondary energy source
	NO _x (ppm)		SO ₂ (ppm)		
	Natural gas	Fuel oil	Natural gas	Fuel oil	
Sahacogeneration Power Plant (Chonburi) Unit HRSG#1	73.09	-	0.34	-	None
Sahacogeneration Power Plant (Chonburi) Unit HRSG#2	75.13	-	0.29	-	None
Target (Not exceeding EIA-specified limits)	110	-	18	-	-
Sahacogeneration Power Plant (Chonburi) Unit HRSG#4	90.71	-	0.67	-	None
Target (Not exceeding EIA-specified limits)	108	-	18	-	-
Sahacogeneration Power Plant (Chonburi) Unit HRSG#5	22.83	-	0.54	-	None
Target (Not exceeding EIA-specified limits)	90	-	15	-	-

Note: - Average pollutant concentration as reported by Continuous Emission Monitoring Systems

*Permissible limits as in the B.E. 2547 notification of Ministry of Industry on the limit of air pollutants emitted by power-generating, transmission or distribution plants

Ambient air quality monitoring

The power plants have also monitored and watched out for the ambient air quality in nearby areas, specified in EIA as the areas that may be affected by the operations. The monitoring in 2022 showed the ambient air quality at all power plants and nearby community stayed within permissible limits. The atmospheric ozone level at Ratchaburi Power Plant's upwind and downwind directions was found higher than the limit in the dry season, which happened every year.

Power Plant	24-hour Average			1-hour Average		
	Total Suspended Particulate (µg/m ³)	Particulate Matter smaller than 10 micron (µg/m ³)	SO ₂ (ppb)	SO ₂ (ppb)	NO ₂ (ppb)	O ₃ (ppb)
Ratchaburi Thermal Power Plant	4-151	3-119	0-7	0-53	0-56	0-156*
Berkprai Cogeneration Power Plant	13-91	5-39	0.9-4.7	0.1-6.7	0.1-44.7	No Monitor
Nava Nakorn Generation Power Plant	26-108	12-60	1-6.2	1-9	< 1-12.8	No Monitor
RATCH Cogeneration Power Plant	29-190	7-57	1.5-3.8	0.9-5.2	2-22.7	8.8-35.5
Nexif Ratch Energy Rayong Power Plant	17-73	11-54	No Monitor	< 1-5	< 1-36	No Monitor
Sahacogeneration (Chonburi)	18-178	No Monitor	No Monitor	1-39	1-40	No Monitor
Target (Not exceeding legal limits)	330^[1]	120^[1]	120^[1]	300^[2]	170^[3]	100^[4]

Note : µg/m³ = microgram per cubic meter, ppb = part per billion):

Standards in line with the Notification of National Environment Board

[1] as specified in the No.24 Notification of the National Environmental Board (B.E.2547) on ambient air quality standards

[2] as specified in the No.31 Notification of the National Environmental Board (B.E.2544) on 1-hour sulfur dioxide standard in ambient air

[3] as specified in the No.33 Notification of the National Environmental Board (B.E.2552) on nitrogen dioxide standard in ambient air

[4] as specified in the No.28 Notification of the National Environmental Board (B.E.2550) on ambient air quality standards

Water Quality Management

RATCH gives importance to water quality management in quantitative and qualitative terms, having all power plants under control to install treatment systems. Wastewater is treated accordingly to its type: mainly one from the production process and the other from office buildings. A focus is placed on the wastewater from the cooling system. With temperature between 38-42 degree Celcius, it must be cooled down: to no more than 33 degree Celcius at Ratchaburi Power Plant and no more than 40 degree Celcius at other power plants. The process is legally required in order not to affect living beings, plants and animals, in water channels to the permissible levels and support the Company's targets.

Water quality management at IPPs

Ratchaburi Power Plant, the Company's principal asset that contributes 72.25% of total revenue in 2022, withdraws water from the Mae Klong River for its production.

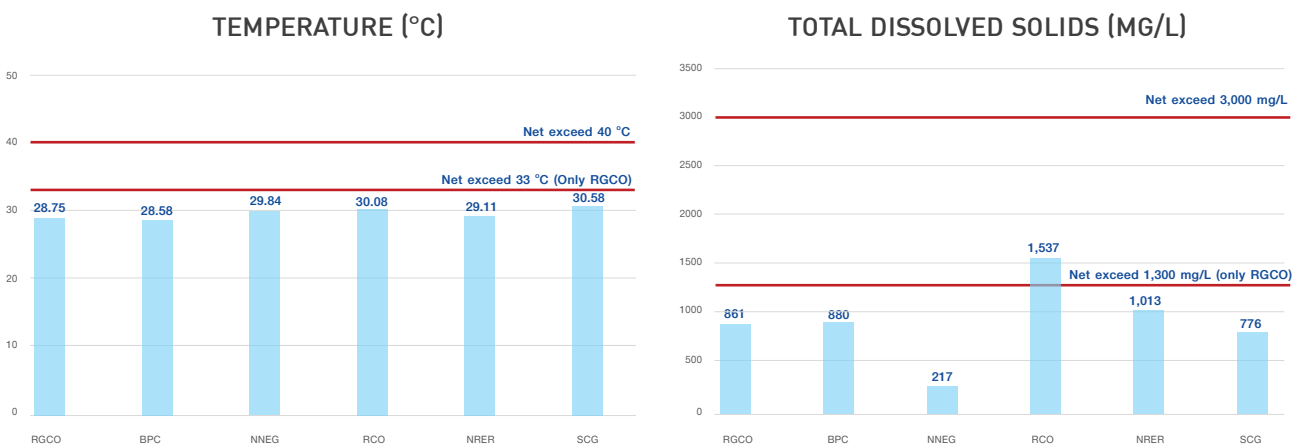
Some of the treated water is further improved through the reverse osmosis filter system for reuse in the production process. Some is used in watering trees and the rest is released to external water channels. Water sample is collected at 3 points - at the discharge point, above and below - for quality check and analysis, to assure community that the treated water will not impact living beings, the ecosystem and the livelihood.

Water quality management at SPPs

RATCH's SPPs are located in industrial estates and their water management system must comply with the industrial estates' requirements. They need a tank or a pond to store water for production and other activities and a system to adjust water quality for electricity generation. A wastewater treatment system is a must to take care of wastewater from all activities. The water quality must meet prescribed standards prior to the discharge to the industrial estates' central wastewater treatment system.

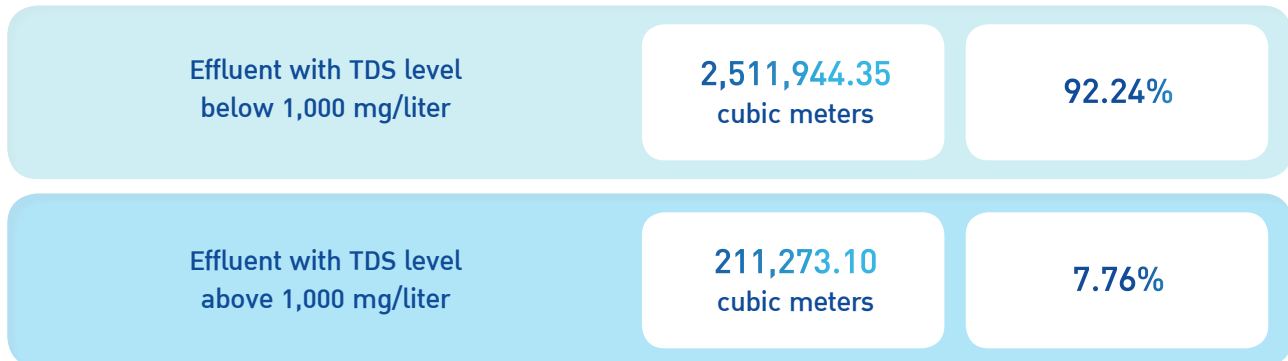
Wastewater quality results

All RATCH-controlled power plants have implemented a stern water quality control and check before disposal to public waterways. The quality check showed that all parameters were within regulatory limits.



Measurement of Total Dissolved Solid

The measurement of Total Dissolved Solid (TDS) in RATCH-controlled power plants' effluent against the 1,000 mg/liter benchmark of the ISO 14046's Environmental Management (Water Footprint – Principals, Requirement and Guidelines) showed that 7.76% of water contained TDS above 1,000 mg/liter and 92.24% contained TDS below 1,000 mg/liter.




- Note:
- Effluent are calculated from 6 power plants which consist of Ratchaburi powerplant, Berkprai Cogeneration Power Plant, Nava Nakorn Power Plant, RATCH Cogeneration Power Plant, Nexif Ratch Energy Rayong Power Plant, Sahacogeneration Power Plant (Chonburi)
 - The Royal Irrigation Department's TDS standard is lower or equivalent to 1,300 mg/liter.
 - The Industry Ministry's TDS standard is lower or equivalent to 3,000 mg/liter.
 - The Ministry of Natural Resources and Environment's TDS standard is lower or equivalent to 3,000 mg/liter.


Waste Management

All power plants under RATCH's control have put efforts in managing waste from production and non-production activities. The 3Rs principles have been applied to stress resource optimization, reuse, waste reduction, repair, recycling and rejection to waste generation. Importantly, all are geared towards zero waste to landfill.

Targets



Zero Hazardous waste to landfill.

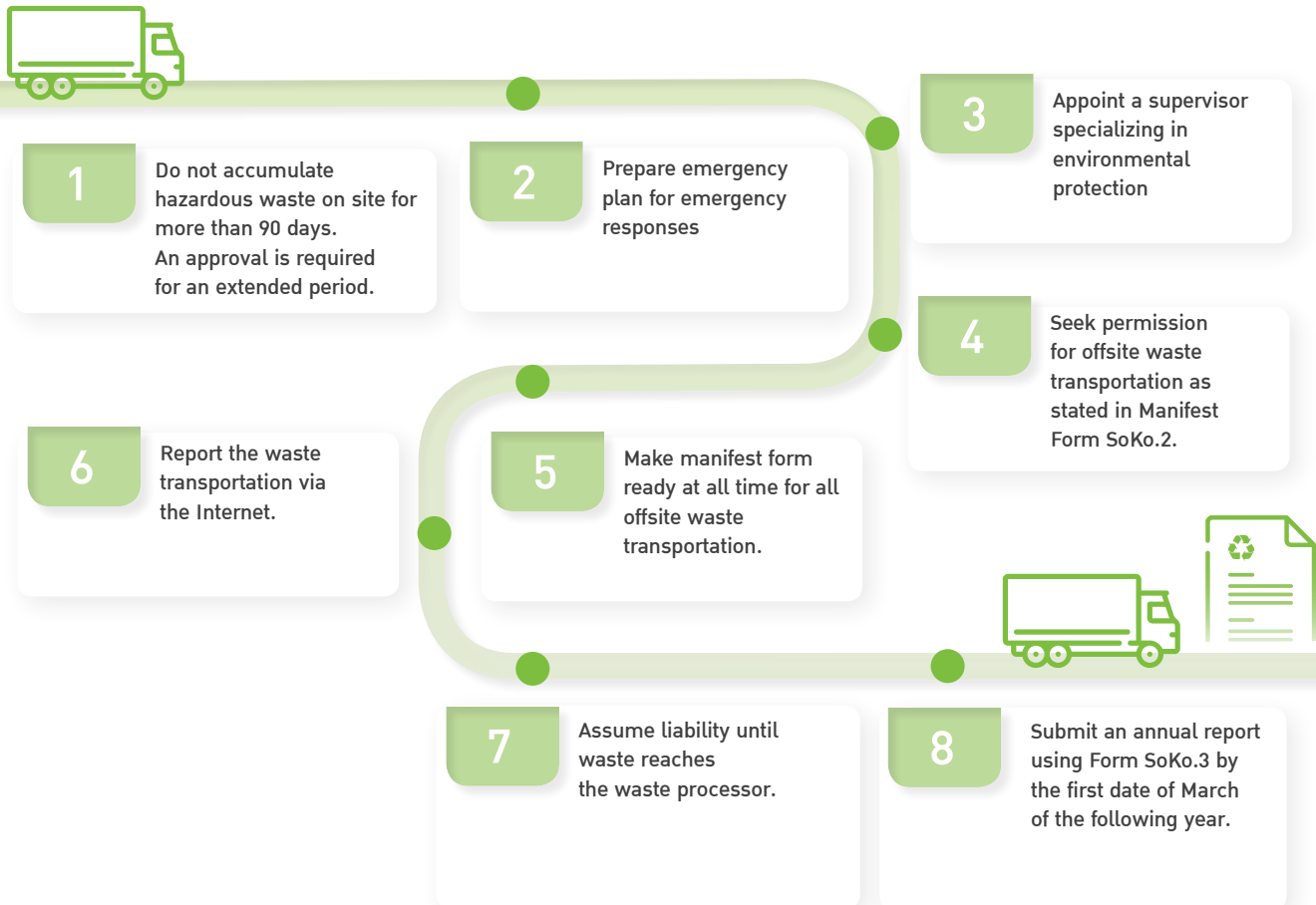


Zero Waste to Landfill

Prepare the resource registry and utilization plan as well as the maintenance plan, to minimize operational waste.	Ensure full resource utilization in all operational stages to achieve the maximum value of product lifecycle, as a way to reduce waste at the source (Reduce).	Establish an efficient procedure to handle waste or unused materials that emphasizes maximum reuse (Reuse), repair damaged items (Repair) and explore reuse possibilities (Recycling).	Avoid materials that will generate waste (Reject) and choose an effective disposal method that highlights reuse.
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The power plants in Thailand have also fully followed the Ministry of Industry’s announcement in B.E. 2548 on industrial waste disposal and tracked waste disposal by authorized waste processors through the application of the manifest system. Manifest sheets are prepared to control the disposal process, from waste transportation to waste processing facilities to the processor’s reporting to the Department of industrial Works.

Manifest system



Waste volume and disposal

The power plants’ waste is generated by either the production process or activities in office buildings. Hazardous waste will be separated from non-hazardous waste, to ensure management efficiency and achieve the zero waste to landfill target.

Types of waste and management method

The primary waste and management methods of the 8 RATCH – controlled power plants (which contributed 92.11% of total revenue in 2022) are as follow:

Source of waste	Type of waste	Type		Location		Management methods	
		Hazard-Ous	None Hazard-Ous	Onsite	Offsite		
Production waste	Generation activities	<ul style="list-style-type: none"> Sediment from treatment Gypsum 	-	✓	✓	-	<ul style="list-style-type: none"> Store gypsum in the pond constructed on an HDPE liner. The gypsum can be used in the manufacturing of gypsum boards Monitor groundwater quality every six months.
		Boiler Slag	-	✓	-	✓	<ul style="list-style-type: none"> Dispose of unused materials according to Ministry of Industry's notification Monitor the disposal through the Non-Hazardous Waste Manifest system
	Maintenance activities	<ul style="list-style-type: none"> Wood/ Wood packaging Insulation Calcium Silicate 	-	✓	-	✓	
		<ul style="list-style-type: none"> Waste containing oil Used lubricant Rags/ oil-tainted gloves Fire-resistant bricks 	✓	-	-	✓	<ul style="list-style-type: none"> Store them in a hazardous waste collection facility before pickup by Department of Industrial Works-authorized disposal companies who dispose of it by recycling or as industrial fuel
Office waste	General waste	-	✓	-	✓	<ul style="list-style-type: none"> Sort waste for recycle banks, store for the recycling by handlers Hire local handlers to handle non-recyclable waste for segregation and disposal 	
	<ul style="list-style-type: none"> Light bulbs, batteries Spray cans 	✓	-	-	✓	<ul style="list-style-type: none"> Collect and dispose through Hazardous Waste Manifest System (Secure landfilling of stabilized wastes) 	

Performance in 2022

The recovery rate of hazardous and non-hazardous waste was 97.29% while 1.12% of waste was disposed by methods other than landfill.

Disposal methods	Applied method	Type of waste (Ton)		Total (Ton)	%
		Non-hazardous	Hazardous		
Transformation to new materials (Recovery) 97.29%	Reuse	15.3	0	15.3	0.05
	Recycle	6,435.7	20.6	6,456.3	21.07
	Other Recovery	23,335.2	11.9	2,3347.1	76.17
Disposal 2.71%	Incineration With Energy Recovery	0	186.7	186.7	0.61
	Incineration Without Energy Recovery	1.3	10.7	12	0.04
	Landfill/Storage	459.4	34.7	494.1	1.61
	Other disposal operations	0.9	137.0	137.9	0.45

Ratchaburi Power Plant's gypsum disposal

Ratchaburi Thermal Power Plant was instructed by EGAT to operate with more bunker oil. It was thus required to switch on the desulfurizer that produced 5,057.5 tons of waste gypsum. The gypsum was recoverable and accounted for 16.5% of all recoverable waste. The gypsum was stored in the gypsum pond, waiting for the recovery process.

Ratchaburi Power Plant gradually uses the stored gypsum in gypsum board manufacturing for community use. In 2022, 5,057.5 tons of gypsum was used. Since 2016, 45,758.5 tons of gypsum has been used. The gypsum board manufacturing is a collaboration between Ratchaburi Power Plant and Siam Gypsum Industry (Songkhla) Company Limited and Knauf Gypsum (Thailand) Company Limited. The gypsum boards are handed to community.



Noise management

RATCH's power plants have established measures to watch out and keep noise from the production process within specified levels. Major noise contributors are generators, water pumps and maintenance activities. The power plants have ably complied with legal requirements on noise control, to protect job operators and community in the vicinity from negative impacts.

Target

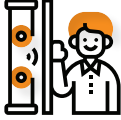
Noise control and prevention

Reduce noise at the source

Reduce noise at sound conductors/ transmission paths

Protect people

- Build a control room in the combustion room to reduce noise at the source
- Install silencers near the the release valve and the pipeline connected with water pumps
- Inform community ahead of activities that will cause loud noise
- Build sound barriers, such as trees, around power plants
- Install clearly-visible warning or safety signs in loud-noise areas
- Ensure job operators always wear personal protection equipment (PPE) before entering the site and prohibit them from working in areas with excessive noise levels for a longer period of time than permitted by labor laws




Target

Noise level measurement

Noise level at the source

Noise level in community/sensitive areas

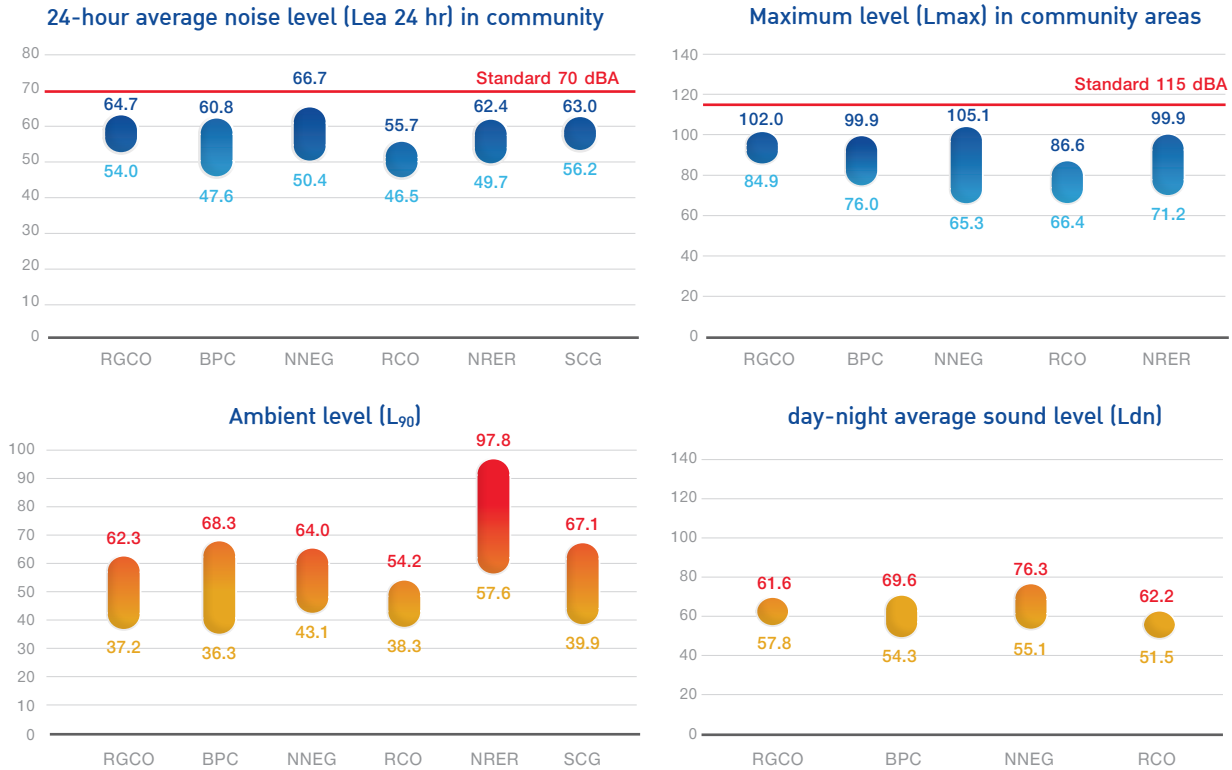
- Measure noise levels at the site accordingly to workplace safety standards and conduct 2 or 4 times/year measurement of ambient noise levels in front of the power plants' fence and sensitive community areas.
- Order the measurement of the 24-hour average noise level (Leq 24 hr), maximum level (Lmax), ambient level (L₉₀) and day-night average sound level (Ldn) every 5-7 days covering working days and holidays.



Noise measurement measures meet standards and no complaint was filed by nearby community.

Results of noise level monitoring in 2022

All 6 RATCH-controlled power plants in Thailand (contributing 83.81% of total revenue in 2022) have been able to keep noise level below permissible limits. Importantly, all did not receive complaints from nearby community concerning noise pollution.

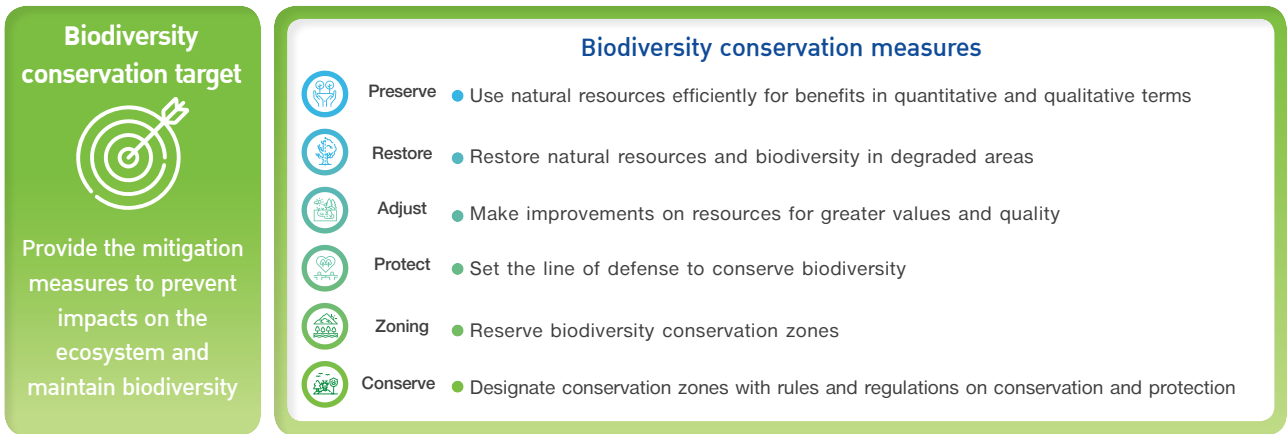


Note: The 24-hour average noise level (Leq 24 hr) and maximum level (Lmax) are based on the No.15 Notification of the National Environmental Board (B.E.2540) on Ambient Noise Standards.

Biodiversity Protection and Conservation

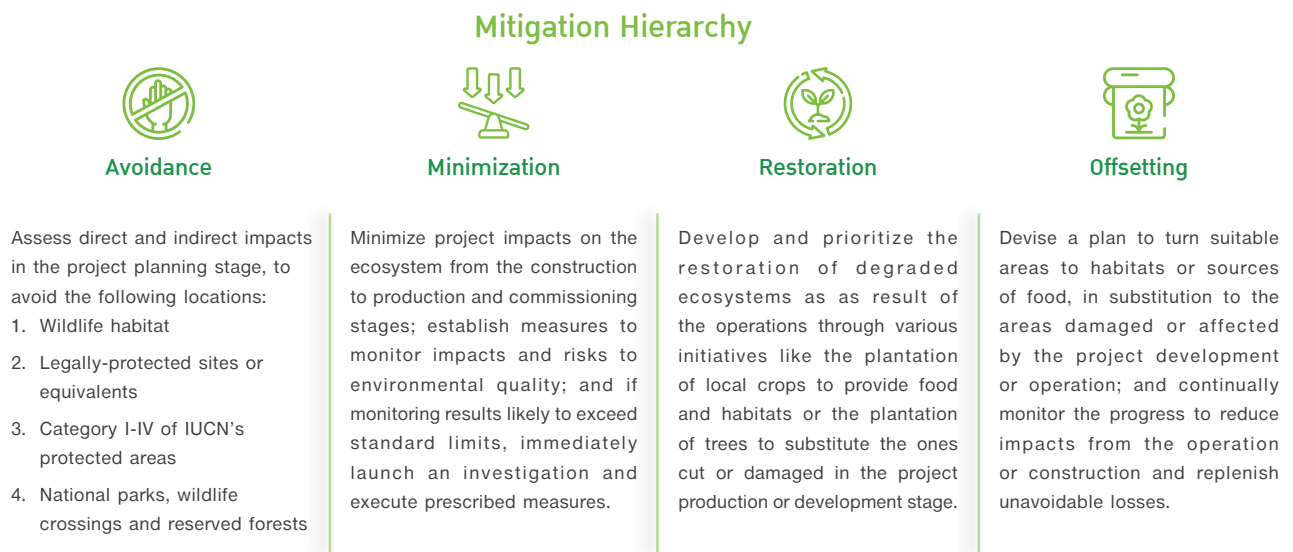
RATCH gives importance to the balance of business development and the conservation of existing natural resources. Where we operate, we have watched out for possible impacts on the environment. When it comes to business development or investment in electricity and related businesses, RATCH demands a thorough assessment of risks and ecological impacts. We also vow not to invest in areas of potential effects that may cause changes to historical sites, World Heritage Site or areas involving rare or near-extinction species, based on the International Union for Conservation of Nature (IUCN)'s Red Lists. Aside, RATCH follows the conservation principles to protect biodiversity in operating sites and nearby areas under the following 3 approaches:

1. Wise and optimized resource utilization
2. Rehabilitation and restoration of degraded areas
3. Conservation of valuable and rare resources



Mitigation of impacts on biodiversity

RATCH has applied Mitigation Hierarchy in formulating its plan to prevent risks on biodiversity and build as well as restore biodiversity, to win public trust despite the Company's growth plan that may cause impacts on natural resources and biodiversity in the areas where new projects are developed. The hierarchy, aligned with the IUCN's concept, has 4 elements as follows:



Impacts on key measures and biodiversity monitoring results

The 11 power plants under RATCH's control, in Thailand or overseas, that contributed 92.11% of total revenue in 2022, have 150,419.3 rai or 24,067.1 hectares of combined operating areas. All conducted the assessment on possible impacts on the biodiversity during the project feasibility and valuation stage. They have devised standard mitigation measures which were approved by relevant regulatory bodies.

Biodiversity assessment at key projects

Detail	Number (Site)	Area (hectare)
Operating area of activity/project	11	24,067.1
Assessment of biodiversity impacts	11	24,067.1
Areas with biodiversity impacts	7	23,978.8
Biodiversity management areas	7	23,978.8

In 2022, 11 RATCH-controlled power plants continually ran biodiversity monitoring and assessment as follows:

Biodiversity impact monitoring measures



Ratchaburi Power Plant
(Area: 322.4 hectare)

Preventive and monitoring measures

- Track the quantity and diversity of wildlife
- Biannually trace the species, density and biodiversity index of living organisms in wastewater pond

Major impacts

The construction and operation affect wildlife habitats, the ecosystem and living organisms in the water. That concerns all 5 groups of living beings – birds, mammals, amphibians, reptiles and plankton (phytoplankton and zooplankton) as well as benthos.

Results of Ratchaburi Power Plant's 2022 biodiversity survey

1. Wildlife numbers and diversity

The survey found 108 species of wild animals around Ratchaburi Power Plant: 6 mammal species, 83 bird species, 11 reptile species and 8 amphibian species.

All 108 species, 82 species were protected under the Wildlife Reservation and Protection Act B.E. 2562 which included 79 bird species and 3 reptile species.

Wildlife classification by conservation status

Category	Number	Near Threatened (NT)	Vulnerable (VU)	Least Concern
Thailand's bio-resources status (2017)	108 species	2 species <ul style="list-style-type: none"> • Indian Cormorant (<i>Phalacrocorax fuscicollis</i>) • Asian golden weaver (<i>Ploceushy poxanthus</i>) 	1 species <ul style="list-style-type: none"> • Purple Heron (<i>Ardea purpurea</i>) 	105 species
International Union Conservation of Nature (IUCN) (2020)	103 species	1 species <ul style="list-style-type: none"> • Asian golden weaver (<i>Ploceushy poxanthus</i>) 	None	102 species

The number of wildlife species in 2022 increased from the previous year with 8 more bird species following seasonal migration, 2 reptile species and 1 amphibian species. On the variation of wildlife found near Ratchaburi Power Plant, the qualitative similarity index was at 65.6-76.3%, compared to 81% during the 2021-2022 period, indicating similarities of wildlife in the corresponding period.

2. Species, density and biodiversity of living beings at the discharge point

Two surveys were conducted in January and July 2022 to explore the density of phytoplankton, zooplankton and benthos in Khlong Bang Pa, to which the power plant's wastewater was discharged. Benchmarked against Wilhm and Dorris biological parameters for water quality criteria, the water quality was good enough for phytoplankton, zooplankton and benthos. The diversity index in the $1.0 \leq H' \leq 3.0$ range indicated the water source could accommodate the living beings. Though, the quality tended to move up or down on seasons change.



Berkprai Cogeneration Power Plant
(Area: 8.6 hectare)

Preventive and monitoring measures

Tracking the sum of species, abundance, and density to calculate the biodiversity index of living organisms in water, twice a year at 4 discharge points

Significant impacts

Power generation creates discharge that, with sub-standard treatment, may affect the ecosystem and living organisms in water like phytoplankton, zooplankton, and benthos.

Result of Berkprai Cogeneration Power Plant's biodiversity monitoring

The sum of species, density and diversity of phytoplankton, zooplankton, benthos, baby aquatic animals and fish eggs at the pumping station and discharge points - 50 meters above the pumping station and 50, 500 and 1,000 meters below the discharge point in the Mae Klong River - was conducted in May and September 2022. The survey showed that the diversity index of phytoplankton, zooplankton and benthos were similar, while the diversity index of fish eggs and baby fish indicated low diversity.



Nava Nakorn Power Plant and extension part
(Area: 6.9 hectare)

Preventive and monitoring measures

Tracking the sum of species, abundance, and density to calculate the biodiversity index of living organisms in water at Khlong Chiang Rak Noi, twice a year

Significant impacts

Power generation creates discharge that, with sub-standard treatment, may affect the ecosystem and living organisms in water like phytoplankton, zooplankton, benthos, fish eggs and baby fish in Khlong Chiang Rak Noi.

Result of Nava Nakorn Power Plant and extension part's biodiversity monitoring

The diversity of phytoplankton, zooplankton and benthos as well as the abundance of fish eggs and baby fish at Khlong Chiang Rak Noi, where Nava Nakorn Industrial Zone's wastewater was discharged, was surveyed above, at and below the discharge point twice in 2022, in May and November. The survey showed that the diversity index of phytoplankton, zooplankton and benthos were similar as well as the abundance of fish eggs and baby fish was similar at all points, depending on the water quality in different seasons.

Meanwhile, Nava Nakorn Power Plant launched a rehabilitation project, dredging the canal and collecting garbage to preserve aquatic animals' habitats. Baby fish was released to the canal under the "Return Life to the Water" Project for the water source's biodiversity. The project had been organized for 7 years in a row in collaboration with community and relevant government offices.



RATCH Cogeneration Power Plant
(Area 8.1 hectare)

Preventive and monitoring measures

No monitoring measure was set.

Significant impacts

The power plant's activity created no impact on the ecosystem and biodiversity as is located in a city area. Treated wastewater was reused by other organizations, instead of discharge.



Sahacogen (Chonburi) Power Plant
(Area 4.8 hectare)

Preventive and monitoring measures

No monitoring measure was set.

Significant impacts

The assessment of the power plant's impacts on the environment and biodiversity found no risk or impact on living organisms.



Nexif RATCH Energy Rayong Power Plant
(Area: 4.6 hectare)

Preventive and monitoring measures

No monitoring measure was set.

Significant impacts

The assessment of the power plant's impacts on the environment and biodiversity found no risk or impact on living organisms.



Collinsville Solar Farm
(Area: 70.9 hectare)

Preventive and monitoring measures

No monitoring measure was set.

Significant impacts

The power plant caused no risk or harm on living organisms.



Mt. Emerald Wind Farm
(Area: 2,400 hectare)

Preventive and monitoring measures

Tracking the sum of species and diversity of fauna at 5 sample areas (including 2 areas at the power plant's premises), once a year for birds and bats and 3 times a year for quolls.

Significant impacts

The power plant's construction and generation activity cause impacts on animal habitats as well as the sum and diversity of local animals.

Result of Mt. Emerald Wind Farm's biodiversity monitoring

The surveys of the numbers and species of fauna, once a year for bird and bats and 3 times a year for quolls, were conducted. The surveys showed that the number of birds, bats and quolls was intact.



Yandin Wind Farm
(Area: 15,000 hectare)

Preventive and monitoring measures

Tracking the sum of species and diversity of local birds and plants every 2 years.

Significant impacts

The power plant's construction and generation activity cause impacts on living beings. They may harm local animal habitats or birds may collide with wind turbines, cables or maintenance vehicles.

Result of Yandin Wind Farm's biodiversity monitoring

The wind farm conducted biannual surveys on the sum, diversity and species of local birds and plants. The surveys in 2022 found dead birds, which were not either protected or rare species, and showed no impacts on bats.



Collector Wind Farm
(Area: 6,200 hectare)

Preventive and monitoring measures

Tracking the sum of species of birds and bats every year and surveying animal carcasses on a monthly basis

Significant impacts

The power plant's construction and generation activity cause impacts on animals, plants, forests and pastures.

Result of Collector Wind Farm's biodiversity monitoring

The wind farm conducted an annual survey on the sum of local birds and bats and a monthly survey on carcasses, to monitor possible impacts on local animals. The surveys in 2022 found the carcasses of birds and bats which are not either protected or rare species.



Asahan-1 Hydroelectric Power Plant
(Area: 40.9 hectare)

Preventive and monitoring measures

Forest rehabilitation measures were set to replenish the lost forest areas. No monitoring measure was set.

Significant impacts

The power plant's construction and generation activity cause impacts on plants, forests and animal habitats.

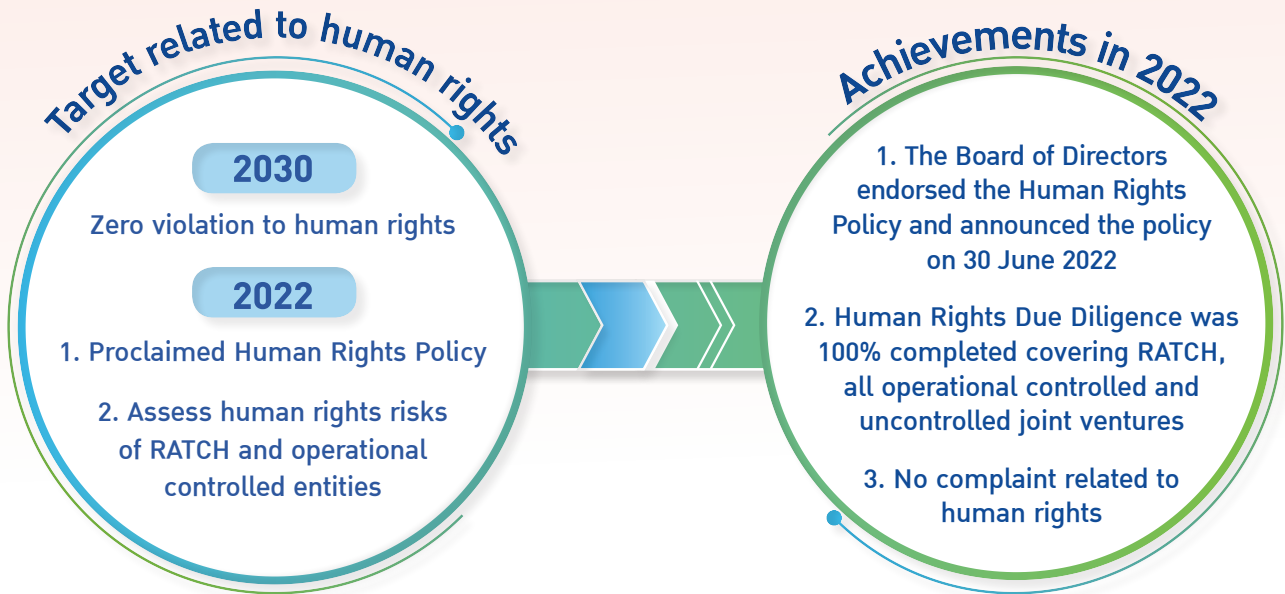
Result of Asahan-1 Hydroelectric Power Plant's biodiversity monitoring

In 2022, the power plant replenished the lost forest areas by growing a total of 30,000 trees around the catchment areas of Lake Toba, North Sumatra, Indonesia.

Respect for Human Rights



Under the Sustainability Strategy, human rights are a material topic in the social dimension. RATCH sets a goal to achieve effective human rights management and prevention of violations within the company, all joint ventures with operational control and uncontrol and targets zero violation to the human rights of stakeholders throughout the value chain in 2030. A 5-year roadmap (2023-2027) was devised to steer the organization towards the target.



Enforcement of Human Rights Policy

RATCH started the Human Rights Policy drafting process in 2022. The principles and guidelines were drawn up in alignment with domestic legislation, corporate governance best practices and international human rights principles that encompass the Universal Declaration of Human Rights (UDHR), the United Nations Guiding Principles on Business and Human Rights (UNGPs), the United Nations Global Compact (UNGC) and the ILO Declaration on Fundamental Principles and Rights at Work.

The Human Rights Policy shapes the human rights management and operational guidelines of the company and controlled businesses, for all activities that concern employees or workers, the supply chain, community and society. RATCH also encourages joint ventures, business partners, suppliers and other related parties in the supply chain of the company and controlled businesses, domestically and abroad, to uphold human rights principles and act accordingly to the policy or apply the policy in their operations.

RATCH's Commitment

RATCH's Board of Directors, the Management and employees respect human dignity and treat all stakeholder groups equitably. All are entitled to equal opportunities and non-discriminatory practices regardless of their race, skin color, gender, age, religion, language, faith, social status, family origin, disability and political opinions. They shall also be protected under relevant legislation and human rights principles. RATCH vows to be prudent, to prevent human rights violations in work processes.

Human Rights Principles	Human Rights Management
<ul style="list-style-type: none"> Commit to zero tolerance of child labour by clearly specifying age criteria and conditions of employment strictly in line with local labour laws in any country. 	<ul style="list-style-type: none"> Develop the Human Rights Due Diligence process for the company, controlled entities and the supply chain, to identify human rights risks, impact assessment, and preventive, mitigating and remediating measures as well as an appropriate, fair or universally-accepted remediation process; and investigate human rights violations and compliance with the Human Rights Policy for regular reporting and disclosure.
<ul style="list-style-type: none"> Promote fairness in the workplace by treating all employees and workers as well as migrant workers in a fair and equal manner at all operating sites. Work rules and conditions are identified in mutually-agreed employment contracts, entailing wage and welfare, working period, overtime work, work on holidays and other benefits which at least meet minimum legal requirements. The maternity rights of pregnant employees/workers are protected; they can take a maternity leave with pay for a period specified by laws or above and have the rights to return to the same job after maternity leave. 	<ul style="list-style-type: none"> Open for complaints or reports on human rights violations involving the activities of the company, controlled entities and the supply chain through the company's website: www.ratch.co.th and ensure fairness and protection for the complainants or reporting persons in accordance with measures specified in the Code of Conduct.
<ul style="list-style-type: none"> Apply zero tolerance of all forms of forced labor by giving assignments to employees and workers based on their consents and individual capabilities. The company does not tolerate forced labor, prisoners' contribution, slavery and other forms of forced labor exploited for any advantages of its own operation and the supply chain of the company and its controlled entities. 	<ul style="list-style-type: none"> Instil and create a corporate culture on human rights where all are alert for violations and do not remain silent; communicate and share knowledge on human rights with the Board of Directors, the Management and employees of the company, controlled-entities and the supply chain in a continuous and constant manner.
<ul style="list-style-type: none"> Allow employees and workers to voluntarily join or not to join activities. They also enjoy freedom of expression as long as it does not violate any laws or moral rules. 	<ul style="list-style-type: none"> Review the Human Rights Policy on an annual basis or in case of major events, for constant conformity with legislation, universal principles and/or business environment.
<ul style="list-style-type: none"> Promote the safety and occupational health of individuals and assets of the company, employees, workers, and stakeholders related to the company and its controlled entities, as well as the supply chain. This principle ensures safe work environment and preventive safety measures and safety risk monitoring systems in line with related safety and occupational health legislation, relevant universal standards and the company's rules. 	<ul style="list-style-type: none"> Deem human rights violations a wrongful act against the Company's Code of Conduct and Human Rights Policy, which is subjected to disciplinary actions or penalties if such act is illegal.

Human Rights Principles	Human Rights Management
<ul style="list-style-type: none"> • Fight against torture and extortion by not participating in any act involving human trafficking, extortion, harassment or any use of force, undesirable bullying or humiliating against dissimilarity of others physical and verbal sexual harassment and sexual assault or cause of physical and mental embarrassment deemed in violation of human dignity. 	
<ul style="list-style-type: none"> • Respect the rights of indigenous/ethnic peoples at all operating areas, through the acceptance, protection and promotion of their traditions, wisdom, cultures, original rights and cultural heritage. 	<div> </div> <p> Read more in RATCH Human Rights Policy </p>

Human Rights Due Diligence (HRDD)

In 2022, RATCH started implementing the Human Rights Policy. Being aware that human rights is an essential factor for successful and sustainable business, the company kicked off the development of the Human Rights Due Diligence, starting with the Human Rights Risk Assessment (HRRRA) to identify actual risks, potential risks and preventive and mitigative measures for the possible impacts on the company's rights holders.

Human Rights Risk Assessment: HRRRA

RATCH assessed the human rights risks in activities of the company, operational controlled entities and suppliers, covering both actual and potential risks.

Assessment Method

1. Identification

- Analyze issues in the company's activities and study actual risks faced by companies in the same industry, global trends and emerging events during the COVID-19 pandemic.
- Consider an act a risk if it may cause impacts on rights holders and the vulnerable.
- Identify women, pregnant women, children, people with disabilities, the elderly, LGBTQI+ persons, indigenous peoples, migrant workers and third party's employees as the vulnerable.

2. Assessment of Inherent Risk

- Assess and prioritize existing risks that have not yet been controlled.

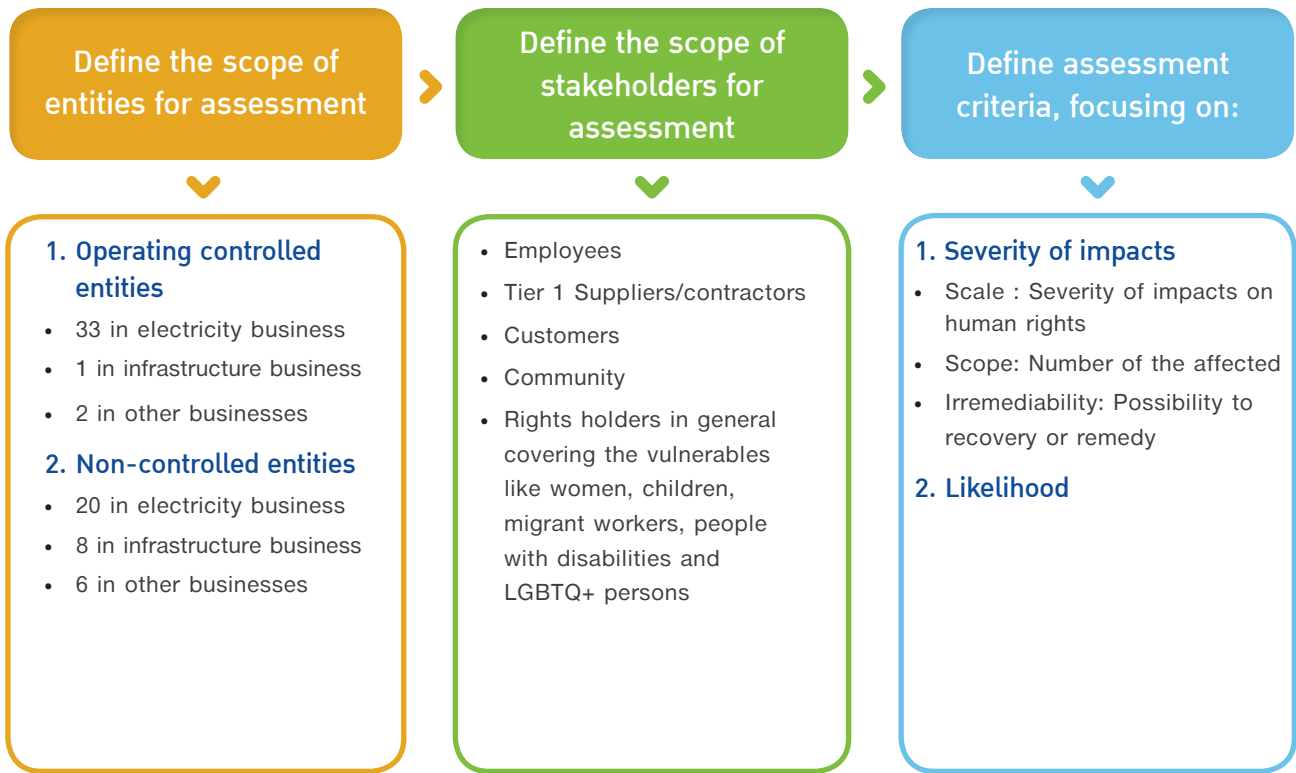
3. Assessment of Residual Risk

- Assess and prioritize the risk remaining after mitigation measures have been applied.






4. Prioritization of Risks

- Prioritize salient issues from extreme residual risks and identify mitigating measures to reduce the risk level.

Rights Risk Assessment Process




Rights Holders and Human Rights Issues Under Assessment

Involved rights holders	Assessed human rights issues	
 <p>Employees</p>	<ul style="list-style-type: none"> Work environment Health and safety Discrimination and violation 	<ul style="list-style-type: none"> Freedom of association and collective bargaining Illegal workforce
 <p>Tier1 Suppliers/Contractors</p>	<ul style="list-style-type: none"> Work environment Health and safety Discrimination and violation 	<ul style="list-style-type: none"> Discriminating acts against suppliers/contractors in procurement process
 <p>Community</p>	<ul style="list-style-type: none"> Health and safety Standard of living Land ownership and resettlement 	
 <p>Customers</p>	<ul style="list-style-type: none"> Health and safety Personal data 	
 <p>All rights holders</p>	<ul style="list-style-type: none"> Cybersecurity/Information safety 	

Assessment results and preventive measures


Issues of RATCH and operating controlled -entities	Preventive measures
 <p>Health and safety of Tier1 suppliers/contractors</p>	<ul style="list-style-type: none"> • Enforce Supplier Code of Conduct in the supplier selection process. • Strengthen the enforcement of rules and regulations on safety, occupational health and the environment. • Supervise accordingly to ISO14001 environmental management standard. • Assess job risks prior to starting work. • Include labor protection and safety measures as a condition in the contract. • Arrange safety training for suppliers/contractors and sub-contractors. • Demand suppliers/contractors to evaluate job risks and set preventive and remediation measures. • Monitor suppliers/contractors' operations and compliance with safety measures. • Prepare a process/measure to handle complaints as well as a compensation and remediation process.
 <p>Health and safety of community</p>	<ul style="list-style-type: none"> • Comply with the company's Human Rights Policy and the Code of Conduct. • Prepare a complaint-receiving process along with a rehabilitation and remediation process . • Assign the Community Relations Unit to interact with community. • Prepare an emergency/crisis response plan and evacuation plan, engaging community with regular drills. • Follow EIA measures on community development.
 <p>Community standard of living</p>	<ul style="list-style-type: none"> • Establish a tri-partite committee as a panel for dialogue with community and relevant stakeholders. • Survey community satisfaction. • Organize activities to raise community safety awareness. • Contribute fund to the Power Development Fund (in Thailand). • Identify a dialogue process with community for settling concerned issues or remediation actions.
Issues of the company and controlled entities' tier1 supplier/contractors	Preventive measures
 <p>Safety and health of suppliers' employees</p>	<ul style="list-style-type: none"> • Evaluate supplier risks and categorize them accordingly to risks and impacts on goods and service supply. • Demand the application of Supplier Code of Conduct. • Make the assessment on human rights issues a part of qualification process. • Evaluate the risks on safety and occupational health of high-risk suppliers. • Organize risk orientation for suppliers' employees and demand safety assessment prior to starting work. • Make safety equipment a condition of the contract. • Require suppliers to provide insurance to employees for high-risk jobs. • Require suppliers to provide medical checks to employees for high-risk jobs. • Require job risk assessment every 2 years. • Apply universal safety standards in the operations: Stop Work Authority and Lock-out/Tag-out LOTO. • Control the operations accordingly to ISO45001.

Issues of the company and controlled entities' tier1 supplier/contractors	Preventive measures
	<ul style="list-style-type: none"> Require suppliers to show medical examination reports; permit to work in confined space, permit for hot work, height work permit or other permits required by laws. Make sub-contractors' ESG assessment a condition of the tier1 supplier contract. Monitor compliance with the company's measures and rules.

Issues of non-controlled entities	Preventive measures
 <p>Labor treatment and complaint channel</p>	<ul style="list-style-type: none"> Communicate the company's policy and guidelines with joint ventures for their application. Establish a human rights risk assessment process for activation in the project development stage/investment decision-making process. Supervise joint ventures' compliance with human rights principles through the Asset Management Function and the company's representatives sitting in the joint ventures' board of directors. Coordinate and cooperate with joint ventures in identifying corrective measures and reporting to the Board of Directors. Advise joint ventures to develop a Human Rights Due Diligence process and disclose the results accordingly to industry best practices and universal standards.

Complaint Channels

RATCH has established channels where stakeholders/rights holders can lodge their complaints about human rights violations or reports on possible violations or non-compliance with the Human Rights Policy. The following are the designated receivers:

Receiver	E-mail address	By post	Website
Chairman/directors	directors@ratch.co.th	(Name of recipient) RATCH GROUP PCL. 72 Ngam Wong Wan Rd., Bangkok, Nonthaburi, Nonthaburi, 11000 Thailand	Complaint form https://www.ratch.co.th/en/anti-corruption-whistle-blowing/whistleblowing-channel
Independent directors	id@ratch.co.th		
Audit Committee members	ac@ratch.co.th		
Chief Executive Officer	ceo@ratch.co.th		
Head of Internal Audit Department	internalaudit@ratch.co.th		
			 <p>More details</p>

2023 Plan

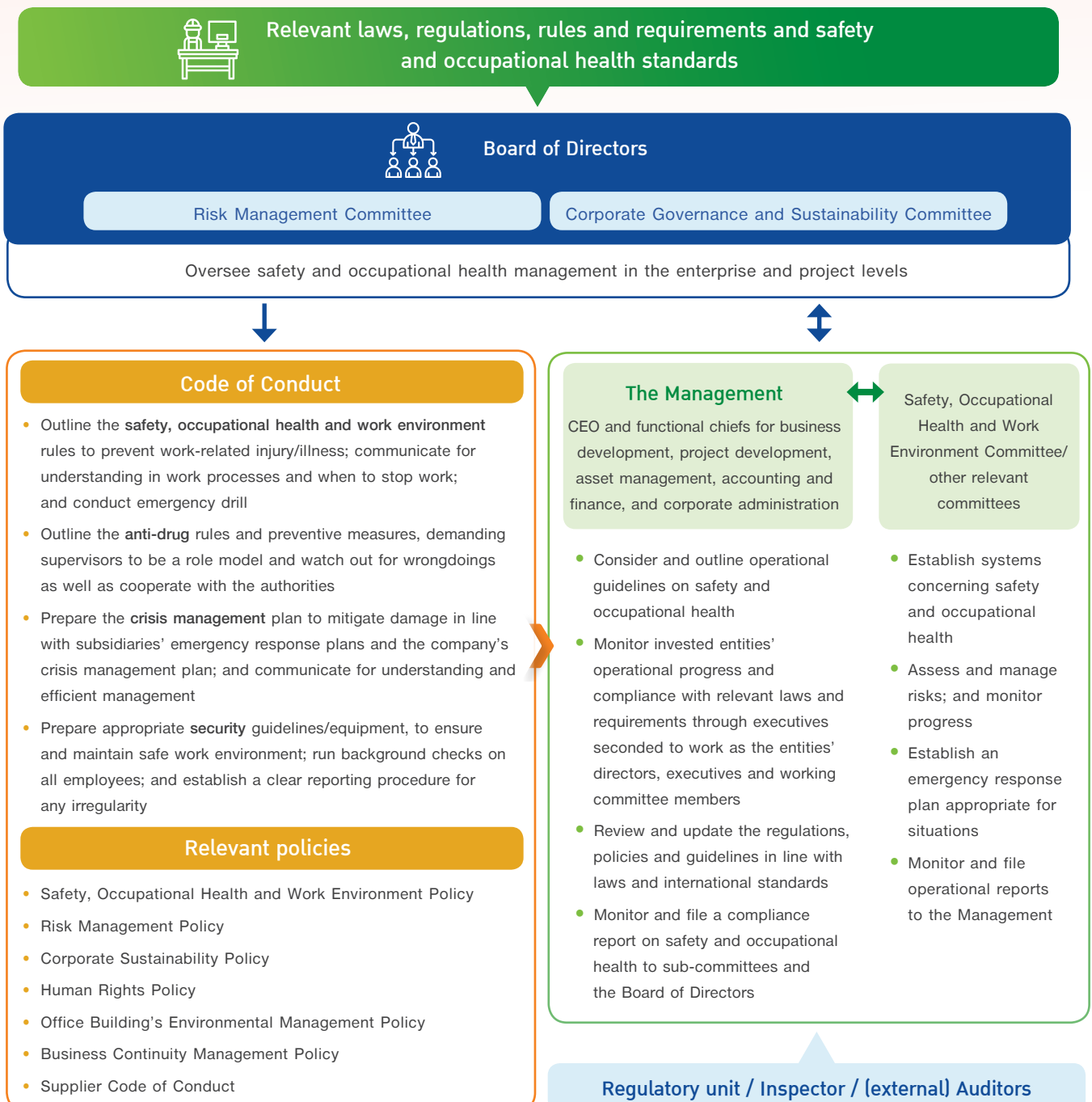
Work plan	Target
<ul style="list-style-type: none"> Review the Company's Human Rights Risk Register developed in 2022. Assess impacts with respect to human rights on employees. 	<ul style="list-style-type: none"> 100% of employees of RATCH and controlled entities is covered by the impact assessment.

Safety and Occupational Health



RATCH is determined to achieve safety, with zero accident, injuries or illness. The company has reiterated the necessity of strict compliance with laws, rules and recognized safety and occupational health standards. Safety and occupational health guidelines are integrated into the Code of Conduct, the Safety and Occupational Health Policy, Supplier Code of Conduct and other policies related to safety and occupational health. The Code of Conduct and policies have been communicated with employees at all levels, contractors and subcontractors for their awareness and consciousness of safety in the workplace.

Safety and occupational health management structure



Safety and occupational health targets



RATCH Group’s safety and occupational health management is overseen by the Board of Directors, with the Corporate Governance and Sustainability Committee and the Risk Management Committee being tasked to monitor the operations and report to the Board of Directors. The Management, comprising the Chief Executive Officer and functional chiefs, are obligated to outline safety and occupational health guidelines for RATCH and invested entities as well as communicate with job operators. Responsible for implementing the guidelines are all departments involved with safety, the environment and risk management, the Safety, Occupational Health and Work Environment Committee and other relevant working committees like the Disease-free, Safety, Drug-free: Good Health and Happy Mind: and Safety Clinic. They are also tasked to monitor the implementation for further improvement, make reports to relevant supervisory units and inform stakeholders in a thorough and continuous manner, so as to ensure all entities achieve the organization’s objectives.

Safety and occupational health operations in 2022



RATCH and all operational controlled entities have maintained their focus on the 6 steps.

The performance in 2022 was summarized below:

Job risk assessment

All high-risk tasks including work in confined space, hot work that causes heat and sparks and work with chemicals required risk assessment prior to the start of work and during the work process, to ensure the safety of all and reduce the severity of danger to life and assets in case of unexpected events.

The assessment took into account risk-control or management measures that can keep possible danger at low or acceptable level, to minimize the risks to all job operators.



Job risk assessment in 2022

Risk (job)	RATCH	RGCO	RCO	SCG Group	NRER	NNEG	BPC	Asahan-1
High	0	0	0	3	2	0	0	0
Medium	0	420	578	256	12	28	200	0
Acceptable	5	217	703	222	7	16	30	299
Low	26	317	0	912	0	6	311	180
Total (jobs)	31	954	1,281	1,393	21	50	541	479
Measures/ operational approach applied for risk control (measures)	12	420	149	910	21	189	10	0

Note : RATCH = RATCH Group Public Co., Ltd. RGCO = Ratchaburi Power Plant
 RCO = RATCH Cogeneration Power Plant SCG GROUP = Sahacogen (Chonburi) Public Co., Ltd., Sahacogen Green Co., Ltd. and Sahagreen Forest Co., Ltd.
 NRER = Nexif RATCH Energy Rayong Power Plant NNEG = Nava Nakorn Power Plant
 BPC = Berkprai Cogeneration Power Plant Asahan-1 = Asahan-1 Hydroelectric Power Plant

Work area inspection

Related units applied strict inspection on work areas when the job shows medium or high risk. The inspection frequency is set accordingly to the risk level as follows:

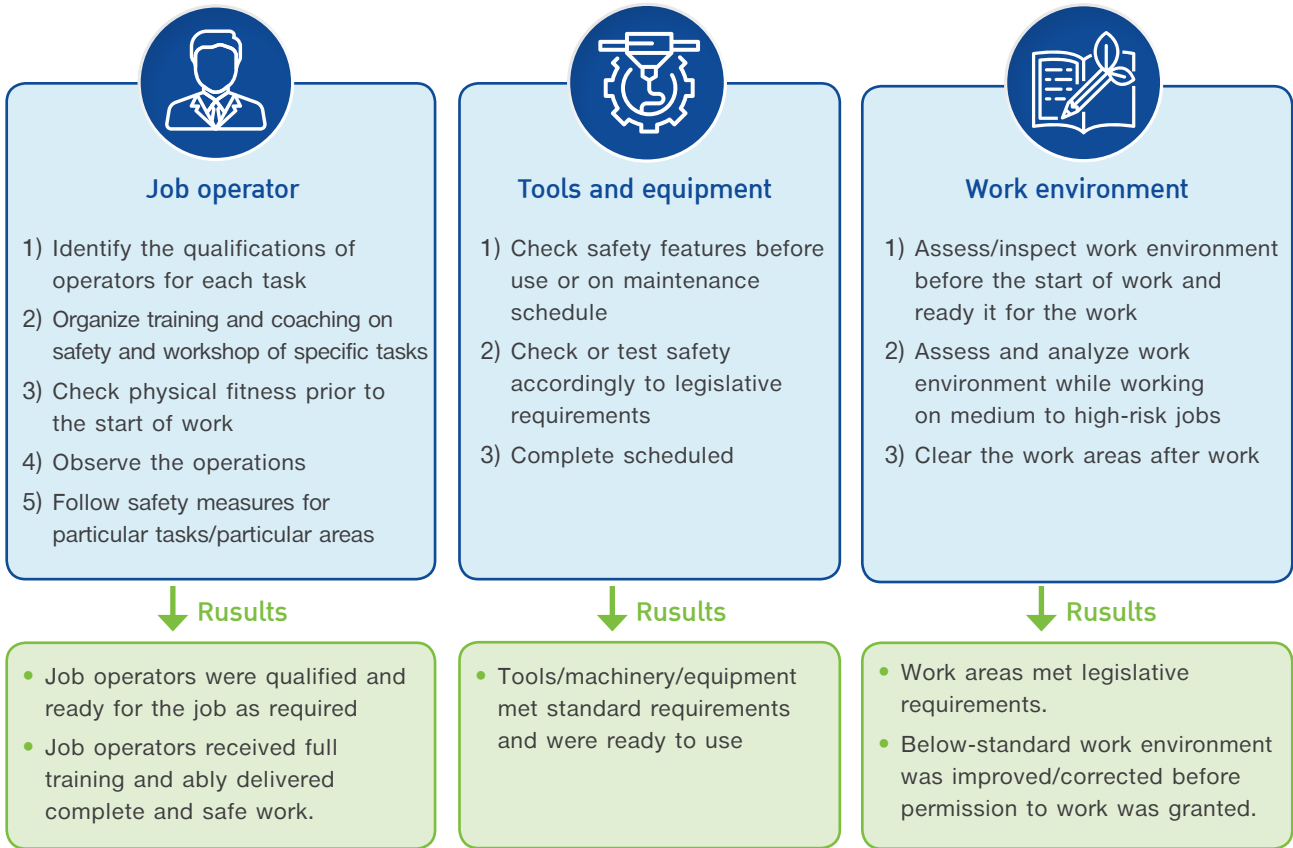
Risk level	Inspection frequency			
	Supervisor	Safety Officer-Supervisor Level	Safety Officer-Professional Level	Safety, Occupational Health and Work Environment Committee
High-risk jobs	All the time	Every day	Every day	Every month or according to work schedules
Medium-risk jobs	Every hour	Every day	Every day	Every month or according to work schedules

Safety supervision

Control principles

Accidents are mostly caused by the poor conditions of job operators, tools/machinery/equipment and the work environment. Control measures to ensure safety involve the Stop Work Authority when job operators are in unsafe conditions and the job operator's right to refuse to work when their physical condition, work environment, or machinery/equipment is in a poor condition and may cause an accident/incident.

Operations



Stop Work Authority

The Stop Work Authority (SWA) allows an immediate halt given risks that may endanger workers' health and life. The authority is given to all job operators or any observer who spots the danger. They can exercise the authority by notifying their supervisors.

Work condition	Observer	Job operators instructed to halt work	Stop Work Authority initiator
<ul style="list-style-type: none"> • Below-standard working • Below-standard working condition • Change in work environment • Change in scope of work or operational procedure • Emergency situations 	<ul style="list-style-type: none"> • Halt the job • Notify controlling persons for immediate correction • Stop work with notification of rationale 	<ul style="list-style-type: none"> • Instantly rectify the unsafe conditions in line with safety measures • Seek supervisors' decision if the unsafe conditions cannot be rectified. 	<ul style="list-style-type: none"> • Discuss with relevant persons to seek mutual decision on a collective corrected safety solution before allowing work resumption.

In case job operators are not physically or mentally fit to work or work environment or machinery/equipment is unsafe and may cause accidents/incidents, the workers can refuse to work. They shall notify supervisors and safety officers, requesting improvement or rectification to the unsafe work conditions before returning to work.

Supervision results

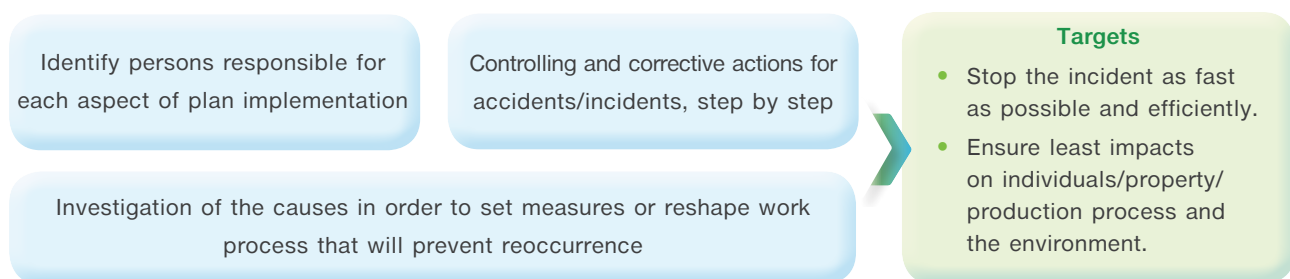
Inspection	No. of jobs	No. of jobs passing inspections	No. of jobs failing inspections	Improvement/rectification
1. Job operators' condition	8,762	8,762	0	-
2. Safety condition of tools/equipment	6,706	6,673	33	<ul style="list-style-type: none"> Standard installation of scaffolding Application of PPE suited for particular jobs Application of appropriate tools for hot work that causes sparks like fire-resistant fabrics and fire extinguishers Clearly defining work areas and entrance to confined space
3. Work environment	6,565	6,562	3	<ul style="list-style-type: none"> Disposal of waste and keep the equipment well organized

Note: The inspection results of RATCH/ RGCO/ RCO/ SCG Group/ NRER/ NNEG/ BPC

Emergency management

RATCH and all power plants have established emergency management plans in line with the contexts of their operational risks as well as the likelihood. The plans are exercised annually to test emergency procedures for incidents included in the plans, at different levels of severity. The drills are to ensure all job operators' understanding in their roles in emergency management and their preparedness for actual emergencies.

RATCH and power plants' emergency response plans under legal requirements and ISO 45001 standard



Emergency Response Drill Statistics in 2022

Emergency incidents	Number of drills								
	RATCH	RGCO	RCO	SCG Group	NRER	NNEG	BPC	Asahan-1	RAC
Level 1 fire and explosion	12	29	1	8	1	6	4	1	1
Level 2 fire and explosion	-	1	1	4	-	1	1	1	-
Level 3 fire and explosion	1	1	1	-	-	-	-	1	-
Gas leak	-	4	-	2	-	2	1	-	1
Oil leak	-	2	-	5	-	2	-	1	-

Emergency incidents	Number of drills								
	RATCH	RGCO	RCO	SCG Group	NRER	NNEG	BPC	Asahan-1	RAC
Chemical leak	-	3	-	4	-	3	2	-	1
Radiation leak	-	1	-	-	-	-	-	-	-
Waste/Sewage transfer	-	-	-	4	-	-	-	-	-
Transformer explosion	-	-	-	3	-	-	-	-	-
Boiler explosion	-	-	-	1	-	-	-	-	-
Natural disasters (Storm/Flood/ Earthquake/ Wildfire)	-	1	-	-	-	-	-	1	3
Epidemic	-	1	-	-	-	-	-	-	-
Snake bite	-	-	-	-	-	-	-	-	1
Broken lift	12	1	-	-	-	-	-	-	-
Pressure pipe break	-	1	-	-	-	-	-	-	-
Confined space	-	-	-	-	-	-	-	1	-

Remark: RAC = RATCH-Australia Corporation Pte. Ltd.,

Emergency incidents in 2022

RATCH and power plants in the reporting boundary experienced small-scale fire, oil leak/chemical leak and disaster incidents in 2022. All the incidents were controlled as planned, without sending impacts on life and property or the production process. The management procedures and practices were improved for greater efficiency and suitability for the situations.

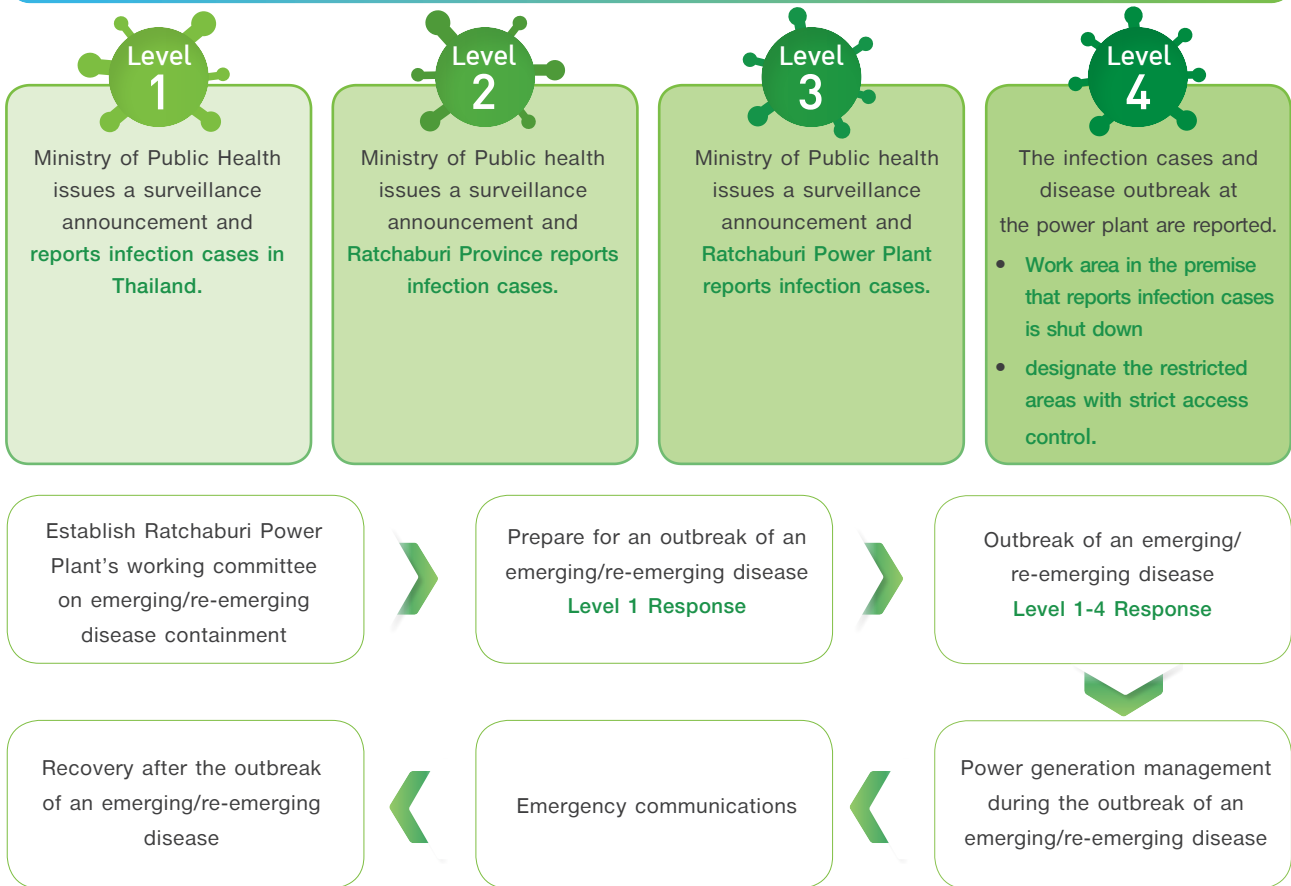
Fire incident	Chemical leak
Sahagreen Forest: 1 incident	Nexif RATCH Energy Rayong: 1 incident Sahacogen: 1 incident

Crisis Management

RATCH has the Business Continuity Plan and the Crisis Management Plan, to contain the impacts from controllable yet unpredictable crises that may be originated internally or externally. The plans are to ensure business continuity. Both plans have been integrated into the Emergency Response Plan of RATCH and all subsidiaries and joint ventures, for more streamlined actions and management efficiency. The procedures and actions as well as emergency situations in all plans are reviewed on an annual basis.

In 2022, Ratchaburi Power Plant organized a training for executives and relevant job operators in preparation for the development of the Business Continuity Management system and guidelines for its own crisis management plan and business continuity plan. The working committee on environment, occupational health and safety is responsible for the formulation of the Business Continuity Plan in light of the outbreak of emerging/re-emerging diseases, so as to ensure the operation and maintenance personnel can uninterruptedly perform their duties. The plan covers 3 stages – before, during and after the outbreak. It is expected to be completed in the second quarter of 2023 and drills will be organized thereafter.

Ratchaburi Power Plant's action plan on emerging and re-emerging infectious diseases



Strengthening of community capacity on safety

In 2022, Ratchaburi Power Plant together with Tambon Ban Rai Municipality and Ratchaburi Provincial Disaster Prevention and Mitigation Office organized an exercise on disaster prevention and mitigation for Ban Rai community, in Ban Rai Sub-district, Damnoen Saduak District, Ratchaburi Province. The exercise, running from the previous year, was part of the power plant's project to enhance the disaster prevention and mitigation capacity of its community network. The simulated emergency scenario concerned the collision of a public bus and an oil truck heading to Ratchaburi Power Plant, leading to oil leak and fire and injuring 13 people.

Participating and observing the drill were 150 representatives from the disaster prevention and mitigation community network in 9 sub-districts around the power plant, Damnoen Saduak Police Station and other relevant offices in the municipality area. A team of speakers from Ratchaburi Provincial Disaster Prevention and Mitigation Office demonstrated incident responses, shared knowledge and gave advice.



Promotion of Job Operators' Health

Aside from work environment and the safety of tools and equipment, all power plants have hosted health promotion activities for their job operators and suppliers' workers that perform their duties at the premises. Annual medical examination is provided along with special medical examination for occupational diseases or work-related risks such as hearing ability, visual ability and other irregularities. The activities are to ensure good health and monitor the effectiveness and sufficiency of each power plant's impact/risk mitigation measures in protecting and safeguarding job operators in all aspects.

Those showing health irregularities are subjected to re-examination and they will be given advice. Those in need of treatment will immediately receive treatment and the results will be continuously monitored. Health promotion activities are organized to prevent the reoccurrence of illness. Job assignments may be altered to reduce health risks on this group of workers, so that their health condition can be rehabilitated or they are not exposed to more impacts.

Health promotion activities for job operators and contractors

Project/Activity	Results
Head Office	
Annual medical examination	85.89% of employees
Safety Healthy Everyday	<ul style="list-style-type: none"> The activity participated by 81 employees and Tier1 supplier's operators. Talk on "Diets and Exercise" and physical fitness test
Ratchaburi Power Plant	
Disease-free, Drug-free: Good Health and Happy Mind Project and Safety Clinic for 2022	<p><u>Safety Clinic</u></p> <ul style="list-style-type: none"> Distribution of 12 pieces of safety news for employees <p><u>Health Day</u></p> <ul style="list-style-type: none"> 114 employees and O&M's operators attended Massage services and sharing of knowledge on medical cannabis <p><u>Annual medical examination and special examination</u></p> <ul style="list-style-type: none"> 251 employees and O&M's operators <p><u>Massage treatments for office syndrome pain</u></p> <ul style="list-style-type: none"> 50 participants of employee and O&M's operators <p><u>Drug prevention activities</u></p> <ul style="list-style-type: none"> Drug test on 1,925 operators of contractors Areas with drug-related risks were checked once a month <p><u>Activities on mental health and stress</u></p> <ul style="list-style-type: none"> 9 participants of employee and O&M's operators Stress and mental health test, using the results for the designing of stress mitigation activities

Project/Activity	Results
Hearing Preservation for 2022	<ul style="list-style-type: none"> Monitoring on 27 job operators of the O&M supplier exposed to noise level from 85 dB(A) Hearing ability test for 4 exposed job operators with the scale of hearing loss of no more than 15 dB(A) in one ear Training on danger from loud noise for 88 participants
RATCH Cogeneration Power Plant	
Annual medical examination	100% of employees
RCO: No Belly, Zero Disease Activity	<ul style="list-style-type: none"> Promotion of nutrition knowledge and effective diets 31 participants 19 participants showing a decrease in body mass index, or 61.29% of all participants
Nava Nakorn Power Plant	
Annual medical examination	100% of employees
Berkprai Cogeneration Power Plant	
Annual medical examination	100% of employees
Nexif RATCH Energy Rayong Power Plant	
Annual medical examination	100% of employees
Sahacogen Group	
Annual medical examination	100% of employees
The Best Healthy	<ul style="list-style-type: none"> The activity had 110 attendees. Three power plants handed the Best Healthy Award to 3 staff with the highest accumulated hours of exercise and reduced calories as well as the highest regularity of participation in the year 2022.
RATCH-Lao Services Co., Ltd.	
Annual medical examination	82.79% of employees
RATCH-Australia Corporation Pty Ltd	
R U OK? Day	<ul style="list-style-type: none"> The activity was attended by all employees. Activity to promote and campaign for engagement in conversations and care for one another's mental health

Strengthening safety culture

In support of the zero accident target, RATCH emphasizes the building of awareness and understanding in the risks and impacts from negligence or unsafe situations, to ensure correct practices in daily routines for the safety and quality of life of all workers.

Training to raise awareness on occupational health and safety in 2022

Training topic	No. of attendees (Person)										% of Employees	% of Suppliers/ Contractors
	RGCO	RCO	NNEG	BPC	SCG Group	NRER	RL	Asahan-1	RATCH	Total (Person)		
Roles and responsibility of Safety officer (supervisor level / executive level)	8	9	10	8	8	0	0	4	9	56	42.86	57.14
Refresh controller's knowledge about boiler/crane and safety measures	84	9	17	9	72	1	0	3	0	195	26.15	73.85
Health (hearing conservation/ occupational disease/nutrition)	94	60	20	60	157	21	0	2	64	477	49.27	50.73
Safety of work as electrical work, confined space, sound, chemical, high ground	158	124	23	35	140	1	0	6	0	487	29.98	70.02
System operator for working related to water/air/industrial waste	17	0	0	1	0	0	0	0	0	18	5.56	94.44
Safety drive and control the general vehicle/ fork-lift	7	0	0	3	58	17	0	3	0	88	75.00	25.00
How to use tools and equipment (stationary crane and mobile crane)	48	0	1	2	0	0	0	0	0	51	21.57	78.43
Fire suppression at basic to advance level; inside the building; and use of PPE	207	36	42	50	76	21	0	13	207	652	62.88	37.12
Safety, occupational health and work environment for committee workers and new hires	2,179	1,317	1,422	586	1,363	58	218	15	173	7,331	6.71	93.29
Operator in areas with use of natural gas/oil storage/pipeline	8	0	0	0	0	2	0	0	0	10	20.00	80.00
Internal Auditor ISO 14001 & 45001	31	0	0	0	0	0	0	0	0	31	3.23	96.77
Deluge valve and Deluge system and Impairment work permit	0	0	0	0	0	0	28	0	0	28	100.00	0
Knowledge for Coal Fired Power Plant Operation #1	0	0	0	0	0	0	189	0	0	189	100.00	0
Operation BAR/AAR/KM and PPA Case Study #1	0	0	0	0	0	0	113	0	0	113	100.00	0
Nirsoft program and MMS program	0	0	0	0	0	0	30	0	0	30	100.00	0
Training of Monthly	0	0	0	0	0	0	33	0	0	33	100.00	0

Remark: RL = RATCH-Lao Service Co., Ltd.

Major safety statistics in 2022

Target	Safety performance
Head Office	
Zero accident	No accident was reported.
Ratchaburi Power Plant	
Zero accident	<ul style="list-style-type: none"> • 1 Class B accident • Work-related risks were reviewed. New preventive measures were added on and communicated to work operators
Nava Nakorn Power Plant	
Zero accident	<ul style="list-style-type: none"> • 1 Class D accident and the injured was given treatment and continued working. He properly wore PPE when the incident occurred. • The supervision of job operators was strengthened along with repeated instruction on PPE, to prevent reoccurrence.
Berkprai Cogeneration Power Plant	
Zero accident	No accident was reported.
Nexif RATCH Energy Rayong Power Plant	
Zero accident	No accident was reported.
Sahacogen Group	
Zero accident	Campaign for identification of risk areas at workplace <ul style="list-style-type: none"> • Zero accident that leads to lost-time injury • 66 risk areas were identified and the improvement of 59 areas was completed and of 7 areas are underway.
RATCH Cogeneration Power Plant (and Extension)	
Zero accident	1 Class A accident with fatality of sub-contractor's worker at the Extension project
RATCH-Lao Services Co., Ltd.	
Zero accident	No accident was reported.

The construction of RATCH Cogeneration Power Plant's extension part was underway in 2022 and an accident led to the fatal injury of a sub-contractor's worker.

After the incident, the power plant, its tier1 supplier and the tier2 contractor expressed their condolences to the worker's family and proceeded the best assistance, compensation and remediation efforts to the family.

The power plant, its direct supplier and the sub-contractor set up an investigation team to find the cause of the accident and outlined preventive and corrective measures. The measures covered the improvement in safety standards in the particular work area; installation of more necessary safety equipment; comprehensive test on involved tools and equipment; sharing safety lessons based on the incident; and strict requirements on proper PPE. RATCH Cogeneration Power Plant submitted the incident report as well as compensation, remediation and preventive measures to Pathumthani Province Office of Labor Protection and Welfare.

Hours worked and accident statistics

Power plant/ Office	No. of persons			No. of hours worked (hours)			Frequency rate per 200,000 hours worked		
	All employees	All contractors	Total operators	All employees	All contractors	Total operators	Fatal work injury	Lost-time injury	Occupational illness
RATCH	222	56	278	405,096	171,560	576,656	0	0	0
RGCO	47	381	428	85,630	1,285,343	1,370,973	0	0	0
RAC	24	0	24	36,864	0	36,864	0	0	0
RL	214	0	214	524,019	0	524,019	0	0	0
RCO	13	436	449	17,944	608,356	626,300	0.32	0	0
SCG Group	181	755	936	394,483	889,057	1,283,539	0	0	0
Asahan-1	20	95	115	39,984	215,961	255,945	0	0	0
NRER	31	23	54	58,188	754,410	812,598	0	0	0
NNEG	30	970	1,000	57,264	245,564	302,828	0	0	0
BPC	19	50	69	25,544	129,846	155,390	0	0	0
Total	801	2,766	3,567	1,645,015	4,300,096	5,945,112	0.03	0	0

Power plant	RATCH	RGCO	RAC	RL	RCO	SCG Group	Asahan-1	NRER	NNEG	BPC
LTIFR of employees	0	0	0	0	0	0	0	0	0	0
TIFR of employees	0	0	0	0	0	0	0	0	0	0
LTIFR of contractors	0	0	0	0	0	0	0	0	0	0
TIFR of contractors	0	0	0	0	0	0	0	0	0.81	0

Note: LTIFR = Lost-Time Injury Frequency Rate per 200,000 hours worked
TIFR = Total Injury Frequency Rate per 200,000 hours worked

RATCH strives to further improve safety, occupational health and work environment management, for the best protection of job operators' life and property. The company will learn from all incidents that occurred to improve the risk assessment process, work control method and preventive measures. The safety practices will be strengthened, to ensure work safety for all job operators and secure them to return home safely.

Cybersecurity Management



The transition to a digital society forces the business sector to apply information technology in driving the business and daily operations, for greater efficiency, speed and flexibility. Nevertheless, this brings a greater risk of cyberattacks. RATCH gives importance to cybersecurity, for a circumspect defense against cyberattacks: risks from the workforce, work process and information technology system are managed for readiness against cyberattacks and business continuity.

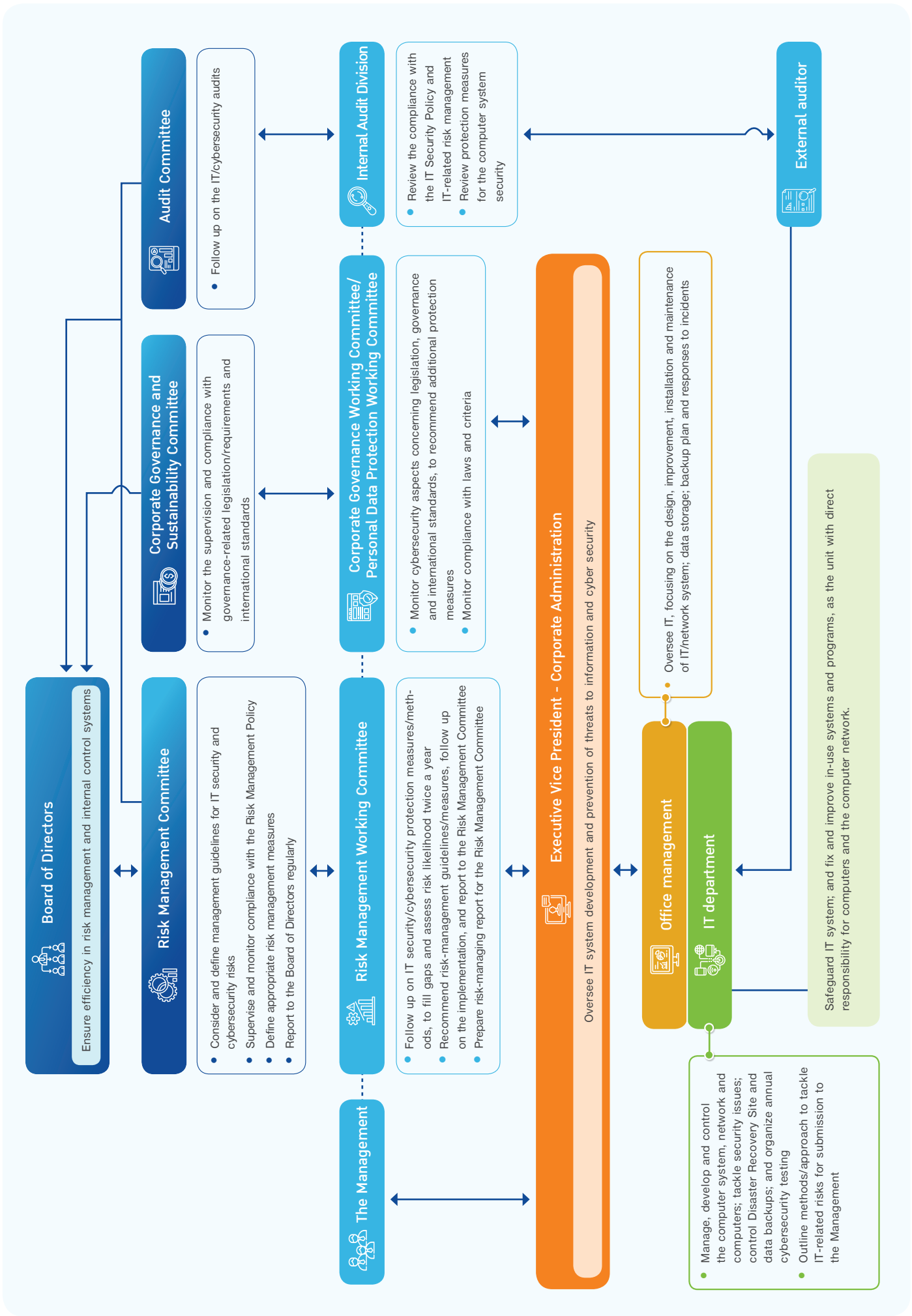
RATCH has outlined the guidelines to protect the computer network, applications, software, key systems and information from possible cyberattacks, in alignment with universal cybersecurity standards. The Company also established a system to fend off damage on the information technology system and cyber incidents that may harm information; and respond to incidents. Risks, based on actual incidents occurring internally and externally, are factored in to prevent the impacts on operations, finance and stakeholders' confidence.

Oversight of IT Security and Cybersecurity

RATCH tasks the Corporate Administration Function to take responsibility for the IT security and cybersecurity. The Executive Vice President – Corporate Administration is to report directly to the Chief Executive Officer. He/she oversees information technology that is the heart of the operations; office management that concerns the safeguarding and development of IT security; risk management; and preparation of a response plan for possible incidents. All implemented actions shall be reported to the Management. Meanwhile, the Corporate Governance and Sustainability Committee, having the Executive Vice President-Corporate Administration as its secretary, shall monitor the matter on a regular basis.

The Risk Management Committee, consisting of all functional chiefs and having Vice President - Head of Corporate Planning and Systems Development Division as secretary, is tasked to study the protection measures for IT security and cybersecurity twice a year. The results will be integrated into risk analysis and assessment of likelihood, so that the committee can recommend additional measures, as necessary. The committee's opinions as well as recommendations are to be presented to the Board of Directors.

Meanwhile, the Internal Audit Division is to review the compliance with the IT Security Policy; the efficiency and sufficiency of risk management the emergency response plan against incidents of high severity; the planned emergency drill according to the Business Continuity Plan; the protection measures for the Company's computer equipment; assessment of IT security and cybersecurity risks; and reporting of cyber threats in the computer network. An external auditor is appointed to review the IT system control, focusing on access to programs and data. The annual review covers the management of user files, user access modification and user revocation. The audit reports of the Internal Audit Division and the external auditor are then submitted to the Audit Committee and subsequently to the Board of Directors.



IT security and cybersecurity Management

RATCH has enforced the Information Technology Security Policy with an objective to safeguard the confidentiality, integrity and availability of information. The policy also entails the authenticity, accountability, non-repudiation and reliability. The Company also imposes the Computer and Network Usage Policy that specifies guidelines on computer and network management. The two policies are the tools to ensure IT security and cybersecurity and business continuity. The policies are reviewed at least once a year or when a severe incident occurs and affects the security.

Components of the Information Technology Security Policy



Enterprise-level IT oversight and management

1. IT Security Policy
2. IT Risk Management that identifies related risks as:
 - 1 Physical and environmental risks involving Data Center and peripherals
 - 2 Risks concerning the usage of software on the Company's computers that should be tackled to prevent insecure installations
 - 3 Risks concerning the usage of the Company's network system that should be tackled to block outsiders' access and attacks
 - 4 Personal risks that require control on access



IT Security

1. Additional guidelines and protection measures under the IT Security Policy, to prevent breach of the policy
2. Shape the organization of IT security, to serve as the basis for the Company's IT security management framework
3. Ensure human resource security, holding all to acknowledge the IT Security Policy as well as their duty and responsibility in using the Company's IT system
4. Manage information asset, encompassing the usage of computer and peripherals (Computer and Peripheral Access Control), the usage of software (Software license), access to the computer system, and usage of e-mails
5. Keep tabs on access to information and IT system (Access Control) through control on Internet use over the Company's network, for efficiency and security
6. Establish Cryptographic Control, to maintain confidentiality and prevent access or modification by unauthorized persons
7. Ensure physical and environmental security through access control to Data Center Room and prevention of information and the computer system from disasters or other environmental causes
8. Maintain the IT operations security, for accuracy and security that will prevent information theft and protect the system from malicious software
9. Maintain communications security by placing control on the computer network to protect the information and IT system from personal misuse, virus or malicious codes
10. Acquire, develop and maintain IT system (System Acquisition, Development and Maintenance), to ensure the computer system's accurate processing as expected by users and reduce the integrity risk
11. Outsource IT services (IT Outsourcing) under specific guidelines and maintain the security on the outsourced services
12. Define the methods to tackle security incidents to the IT system (Information Security Incident Management) and the reporting system for such incidents or system weak points.
13. Ensure the Information Security Aspects of Business Continuity Management to prevent disruptions, with focus on the availability of the Company's IT equipment

Cybersecurity Management

RATCH gives importance to continuous improvement in the efficiency of data security management, to ensure the appropriateness and sufficiency considering the size and significance of the data. The focus is placed on the prevention of personal data and sensitive personal data leak, which could put the Company at risk. The security system is laid out as follows:

Security system	Management method
1. Application security	Control the usage with passwords and identification process, for assessment of risks from possible loopholes
2. Cloud security	Apply tools like Firewall, VPN, password managers, etc. to control access to data, systems and applications in Cloud storage as well as prevent breach of the privacy law
3. IoT security	Demand identification for Internet-connected IoT (Internet of Things)
4. Network security	Provide security tools to protect systems from connection risks and other threats that might affect the Company's operational efficiency, such as Firewall, IPS/IDS, VPN and antivirus software

Prevention of IT security and cybersecurity risks

RATCH outlines a complete procedure to guard against attacks or threats to IT security and cybersecurity, for prompt responses to such incidents.

Method	Action
Response to events/ incidents	<ul style="list-style-type: none"> Prepared business continuity system and plan, containing response actions to incidents Organized recovery drill (IT Disaster Recovery Plan) every year
Analysis of system loopholes or vulnerabilities by internal and external evaluators	<ul style="list-style-type: none"> Tested data backup and SAP systems internally, which were found perfectly functioning Review SAP System control by KPMG Poomchai Audit Limited, concerning access to programs and data, user file management and password modification or deletion. The auditor recommended a strict procedure in informing relevant departments of resigning employees, for prompt access termination or deletion of their usernames.

Cybersecurity Testing

RATCH participated in the Stock Exchange of Thailand's Cyber Resilience Survey 2022 for listed companies, to gauge the level of Company's cybersecurity and use the survey result in the formulation of related development plans and the improvement of operational efficiency.

Under the survey, 3 aspects of listed companies' cybersecurity were assessed in accordance with the National Institute of Standards and Technology (NIST)'s Cybersecurity Framework.

1. Cybersecurity Progress: Level of organization's cybersecurity competency
2. Risk & Resilience Score: Efficiency in assessing and responding to cybersecurity threats
3. Factor Affecting Performance: Other factors that affect cybersecurity operations and data privacy

The assessment results and recommendations were used as the basis for future improvement in the Company's cybersecurity.

Topic	Guidelines for improvement
Identify Identifying and recognizing contexts to kick start risk management	<ul style="list-style-type: none"> • Identify IT-related risks in the supply chain; and set a condition in contracts demanding consistency in suppliers' cybersecurity and the Company's as well as a confidentiality clause • Develop a process to examine suppliers' compliance with contractual agreements and execute the examination at least once a year or prior to contract signing and renewable
Protect Establishing control measures to protect the Company's systems	<ul style="list-style-type: none"> • Organize training and awareness building regarding cybersecurity for employees, ensuring the appropriateness and sufficiency for their roles and responsibilities and the alignment with the Company's policy, guidelines and rules.
Detect Setting irregularity-detecting process and procedures	<ul style="list-style-type: none"> • Enhance the efficiency of incident management and have it tested continuously • Watch out for irregular events continuously • Examine irregular events continuously
Respond Setting process and procedures in responding to irregular situations	<ul style="list-style-type: none"> • Step up on the setting of impact and threat boundary in preparation for cybersecurity threats • Prepare a cybersecurity response plan and clearly communicate with relevant departments on the plan and response procedure • Provide necessary resources for responses to cybersecurity threats in alignment with the plan and prescribed procedure
Recover Setting process and procedures to ensure business continuity and recover the system to its original condition	<ul style="list-style-type: none"> • Constantly review and improve the Business Continuity Plan and the Disaster Recovery Plan

Incident tracking and performance

RATCH has monitored breaches of or non-compliance with IT security and cybersecurity guidelines as well as incidents to the IT infrastructure. The monitoring results are reported to the Management, the Risk Management Working Committee, the Risk Management Committee and the Board of Directors on a quarterly basis.

Focus areas	Unit	Year	
		2021	2022
Breaches or non-compliance with IT security and cybersecurity guidelines (IT Security/Cybersecurity Breaches)			
Total number of information security breaches or other cybersecurity incidents	times	0	0
Total number of data breaches	times	0	0
Total amount of fines/ penalties paid in relation to information security breaches or other cybersecurity incident	Baht	0	0
IT Infrastructure Incidents			
Number of IT Infrastructure Incidents	times	0	0
Financial impact caused by such incidents	Baht	0	0



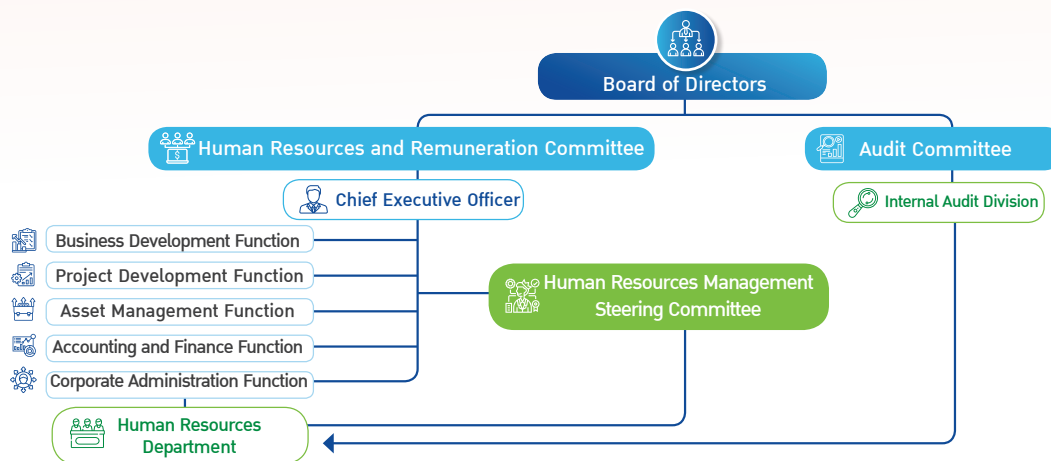
Employee Stewardship





Employees are internal stakeholders that are significant to the company's growth and sustainability. Employee stewardship is thus a key mission that requires a stern and continuous implementation process embedding ethical and governance principles as well as respect for human rights.




RATCH upholds fair labor practices and labor standards enshrined in national labor laws that are based primarily on the International Labor Organization standards. Fair practices concern labor management, work environment and use of labor, encompassing, for example, wage, working hours, holidays, leave, termination, treatment of female workers, prohibition of child labor, safety and occupational health, welfare for labor social security, and capacity building. All are to ensure their happiness, morale and preparedness to do their best in delivering quality products and services to customers, which will in turn enhance the company's competitiveness and warrant job and social security for all employees.

Supervision on Human Resource Management



Roles and Duties

 Board of Directors	<ul style="list-style-type: none"> Define vision and human resource management and executive development strategy, remuneration strategy, guidelines and processes that are clear, transparent, suitable and beneficial for the company's selection, dismissal or termination of contracts with directors or high-level executives; and efficient evaluation process; monitor the implementation.
 Human Resources and Remuneration Committee	<ul style="list-style-type: none"> Define the vision and strategy on human resource management and executive development plan; and supervise the implementation. Ensure the Board of Directors' size and component are suitable to the operations and business context. Set clear, transparent and appropriate criteria, approach and process in the selection, dismissal and termination of directors and high-level executives. Select and nominate qualified persons for director and high-level executive positions. Prepare the succession plan for key executive positions, taking into account the importance of the positions, the selection and capability development. Set the remuneration policy and strategy concerning salary, meeting allowance, per diem, bonus or other benefits of Directors and high-level executives, based on the criteria that are clear, transparent and appropriately corresponding with the scope of responsibility and performance. Determine the guidelines, criteria and process for the assessment of directors and high-level executives' performance, by benchmarking it against the annual targets based on business objectives as well as responsibility and involved risks.

 <p>Audit Committee</p>	<ul style="list-style-type: none"> • Ensure the internal control efficiency and effectiveness is sufficient and suitable. • Monitor the compliance with laws relevant to the operations and the company's regulations, policies and the Code of Conduct.
 <p>Chief Executive Officer and Function Chiefs</p>	<ul style="list-style-type: none"> • Implement the human resource management and remuneration strategies and monitor the implementation. • Apply the human resource management and remuneration strategies set by the Board of Directors and the Human Resources Management and Remuneration Committee as operational guidelines on human resource and remuneration management. • Define organizational human resource management and remuneration policy and strategy and monitor the implementation through the Human Resource Management Steering Committee.
 <p>Human Resources Management Steering Committee</p>	<ul style="list-style-type: none"> • Give recommendations relating to the human resource management policy and strategy, ensuring its alignment with the Board of Directors' vision, business targets and policy. • Review the human resource management criteria and procedure and ensure efficiency, fairness and transparency. • Pre-qualify and select qualified persons for Executive Vice President positions or higher; and submit the names to the Human Resources and Remuneration Committee. • Approve the appointment, promotion and transfer of department heads or employees holding lower positions. • Consider the criteria and conditions of annual salary increase and annual bonus payments for department heads or employees holding lower positions. • Consider and give opinions on the annual human resource development plan. • Consider and give opinions on the Welfare Committee's proposals on welfare and benefit improvement.
 <p>Human Resources Department</p>	<ul style="list-style-type: none"> • Set an efficient human resource strategy, policy, practice and standard in alignment with the company's direction. • Control and supervise personnel development and human resource management activities for alignment with the business direction and targets. • Prepare a work plan, monitor the implementation and report the results.
 <p>Internal Audit Department</p>	<ul style="list-style-type: none"> • Assess the sufficiency and efficiency of the internal control system and the management system for enterprise risks. • Audit the compliance with relevant policies, work plans, regulations, orders and laws as well as corporate governance principles.

Human Resource Management Framework

In recognition of employees' role as a key mechanism towards business success and vision, RATCH's human resource management framework outlines operational guidelines in alignment with the company's missions, strategies and the Code of Conduct, to ensure job security and employee engagement.

The company's regulations, policies and criteria are also set in corresponding with labor laws and international standards, to ensure fair and equitable practices for all employees.

Vision

To become a leading value-oriented energy and infrastructure company in Asia Pacific

Mission

M2

To achieve operational excellence and enhance competitiveness

M4

To raise employees' awareness and motivation for self-development in preparation for competition and business changes

Strategy



Strength

Operate efficiently for worth while revenue and returns and strive for corporate excellence



Synergy

Establish integrated operations with collaboration with leading domestic and international partners for sustainable growth opportunities in potential power and non-power businesses in the value chain; as well as innovations for future value-added



Sustainability

Promote renewable energy and Environmental, Social and Governance for sustainable stability

Treatment of employees

- 1 Emphasize thorough and regular personnel management and development to enhance knowledge and competencies.
- 2 Provide fair remuneration and welfare comparable to that of other leading companies.
- 3 Strictly comply with laws and regulations related to employees.
- 4 Provide a safe and supportive working environment in accordance with the occupational health standards.
- 5 Promote, reshuffle, reward and punish employees in an equitable, honest and just process, based on each employee's knowledge, competency and suitability.
- 6 Welcome comments and recommendations based on employees' professional knowledge.
- 7 Treat employees with respect to individuality and human dignity.
- 8 Avoid any unfair action that may affect employees' job security, threaten or create pressure on their mental state.
- 9 Allow employees to lodge a complaint in the event that they do not receive justice from the specified system and process.

Regulations, orders, policies and rules on human resource management

Employee Policy

Personnel Management Regulation

Work Rules

Order on Overtime Work

Order on Employment and Assignment

Order on Welfares for Probationary Employee and Worker

Order on Administrative Structure and Division of Work

Order on Promotion and Transfer

Order on International Assignment

Order on Employment of Government Officials

Order on Welfare Committee Appointment

Order on Performance and Competency Appraisal

Order on Job Transfer, Secondment or Assignment

Order on Annual Pay Hike

Order on Bonus Criteria

The disclosure on human resource management covered RATCH and four operational controlled entities; Ratchaburi Electricity Generating Co., Ltd, RATCH-Cogeneration Co., Ltd., RATCH-Australia Corporation Pty. Ltd. and RATCH-Lao Services Co., Ltd. (the coverages contributes 84.31% of total revenue in 2022)

Achievements in 2022

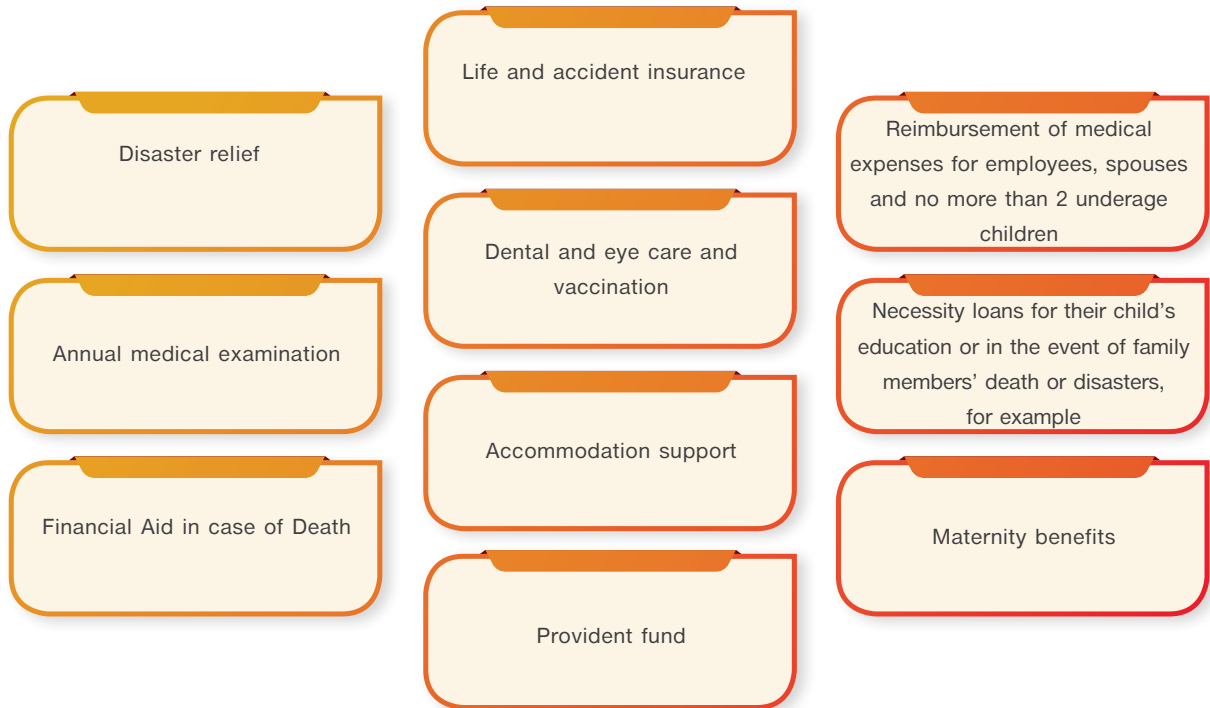
- Turnover rate was at 4.63% achieving the target setting at no more than 5%
- Training hours were 30 hours/person/year, meeting with the target.
- Employee engagement score stayed at 82.56%, achieving the target at 80%.

Key actions in 2022

Employee health protection

RATCH promotes and supports the goal to become an organization that can satisfy employee needs, to attain a positive work environment and employee preparedness and ensure the physical and mental fitness for full efficiency. Actions in this regard are as follows:

- Provide welfares that supports social security and quality of living for employees and families. Being reviewed every 3 years, the welfares are:



- Provide a safe work environment and promote the safety and good health-oriented work culture via continuous training and activities. (Read more in Safety and Occupational Health Section.)
- Provide employees with health assistance and protection during the COVID-19 outbreak, via the following measures designed to protect employees and control and prevent the spread of the virus:

Health Protection	<ul style="list-style-type: none"> • Provide additional insurance coverage against COVID-19 on top of general health insurance • Raise the limit on reimbursable medical expenses for employees at all levels in response to the current state of communicable disease outbreaks
Control and Preventive Measures	<ul style="list-style-type: none"> • Set up screening points for body temperature measurement of all persons entering the premises • Hand out face masks and Antigen Test Kit (ATK) to employees and demand test results prior to starting work • Procure vaccines for employees and their families • Disinfect frequently-touched points in office buildings, provide alcohol • Find hospital beds for employees and/or family members tested positive for COVID-19 • Reduce office congestion by allowing employees to work from home; and arrange the hybrid workplace model that combines Work From Home and Work From Office and requires 14-day retrospective timeline reports prior to entering office buildings • Prohibit physical meetings and allow only online meetings • Arrange a drop point for the delivery of documents and parcels, which are disinfected before entering buildings
Facilitation and Flexible Workplace Master Plan	<ul style="list-style-type: none"> • Apply technology that connects and facilitates employees and provide necessary computer programs for their access to information and database necessary for their work • Shorten work processes and apply the digital approval process through work integration; as well as adjustments in work-related regulations in support of the Work From Home policy



Organizational capability development under HPO Framework

RATCH has monitored the progress of organizational capability enhancement under High Performance Organization Framework (HPO), to become an efficient organization with target achievements and outperformance recognized and exceedingly better than those of its peer group. Under the framework, RATCH aims to achieve sustainable and stable growth.

In 2022, after the diagnosis of organizational performance, RATCH enlisted the work processes for improvement and resolved to work on the processes significant to the company in 4 aspects.

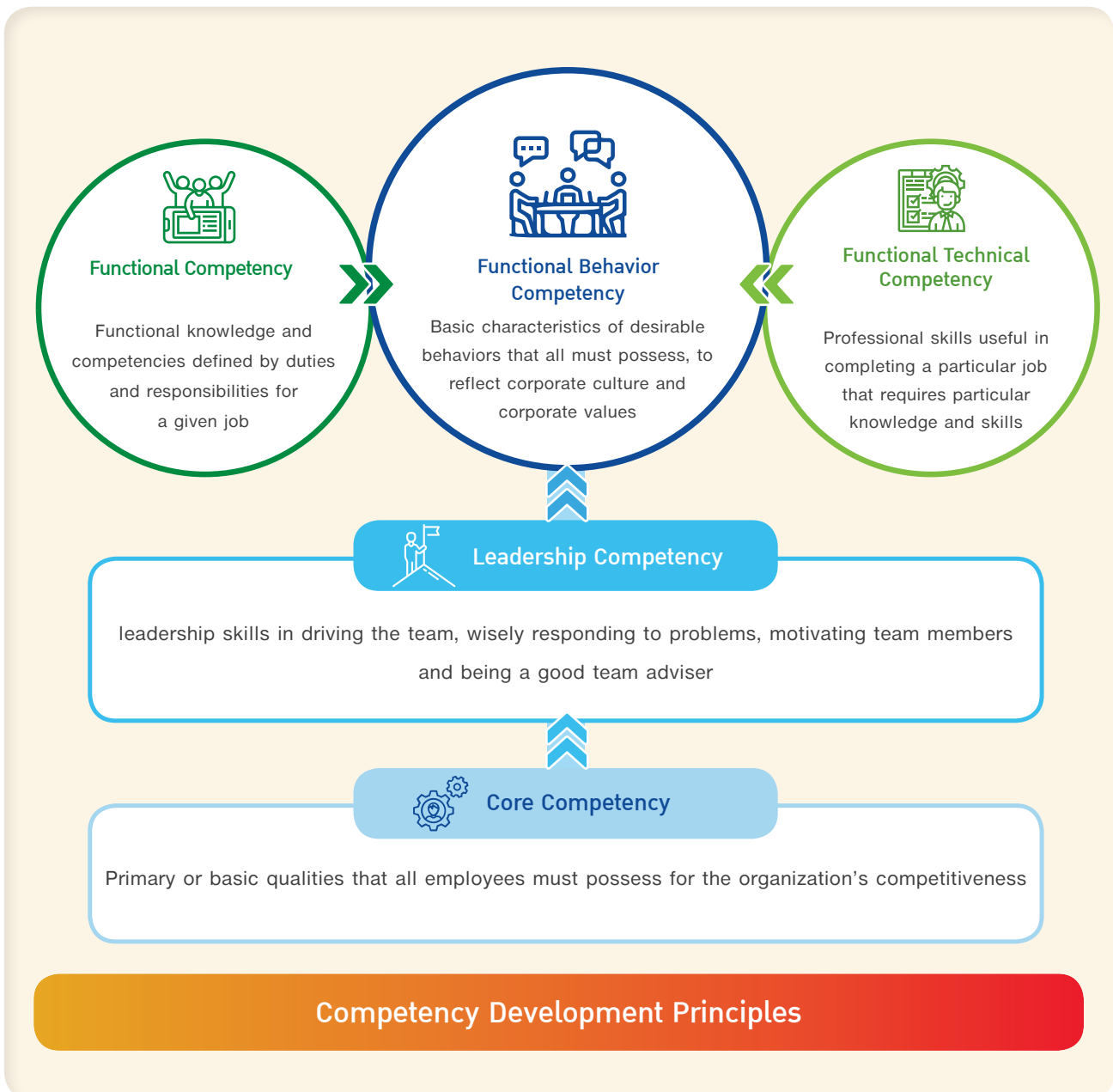
Work process	Work plan	Actions	Results
1. Organization structure reimplementation	<p>Task transfer between Business Development Function and Project Development Function</p> <ul style="list-style-type: none"> Define the scope of responsibilities for Business Development Function and Project Development Function, to ensure smooth task transfer and continuity of work 	<p>Outline a clear transfer process</p> <ul style="list-style-type: none"> Set targets and timetable Prepare form and document for task forwarding Determine access to information Appoint a coordinator of each function to smoothen the transition 	<ul style="list-style-type: none"> All tasks were completely forwarded and completed as planned. Overall satisfaction score was 93.6%.
2. Data Classification	<p>Preparation of data storage system to protect the Group's data in alignment with the Code of Conduct, the internal policies on inside information/confidential information and Personal Data Protection Act</p>	<ul style="list-style-type: none"> Appoint a working committee represented by all functions, to classify information and determine data management approaches Classify data and put it into the Kool Keeper system according to data classification levels 	<ul style="list-style-type: none"> All data was stored in the Kool Keeper system. No leakage of classified information
3. Internal Communication Enhancement	<p>Set communications targets focusing on the company's strategies and objectives, to ensure employees' understanding and the setting of effective work-related targets responding to the company's direction and objectives</p>	<p>Adopt one-way and two-way communications with employees through the following channels:</p> <ul style="list-style-type: none"> Employee meetings Electronic CEO Messages- Electronic bulletin Corporate events 	<p>All actions were completed.</p> <ul style="list-style-type: none"> 2 employee meetings 4 CEO Messages 12 corporate events 8 News releases
4. Internal Knowledge	<p>Organize Knowledge Sharing events covering topics significant to drive performance or the company's goals</p>	<ul style="list-style-type: none"> Organize 3 Knowledge Sharing events and evaluate the benefits for participants Set minimum 70% score for the application of gained knowledge in daily routines 	<ul style="list-style-type: none"> All events were organized as planned. The application score was 94.8%. (Above target)

Employee Capability Development

RATCH emphasized employee capability development, to equip them with new skills necessary to smoothly and continually drive the organization towards corporate goals and improve resilience.

Competency improvement

Through online training and physical workshops, the competency improvement focused on three major areas: core competency; leadership competency; and job family competencies including functional behavior competency and functional technical competency.



Performance in 2022

- Execute 20 enhancement programs for basic competencies concerning safety, occupational health and work environment; basic fire extinguisher, personal data protection, etc
- 16 leadership enhancement programs including Communication Set for Manager and Leadership Awareness.
- Execute programs to enhance functional competencies
 - » 11 programs on behavioral competencies like morality/transparency enhancement, sustainable fight against corruption, building environmental and safety awareness, and Growth mindset for success.
 - » 127 programs on technical competencies like investment guidelines for overseas power plants, power purchase agreements for overseas hydroelectric power plants and TFRS9.

Training courses in 2022

Course	Type of competency	No. of courses	No. of hours	No. of attendees		Expenses (Baht)
				Male	Female	
RATCH Group Public Company Limited						
Development of employee capabilities in core competency	Core competency	2	12	26	39	19,260
Development of employee in leadership competency	Leadership competency	6	78	89	93	1,437,540
Development of employee capabilities in job competencies	Functional behavior	3	33	75	102	588,500
	Functional technical	86	1,140.5	99	115	3,247,482
Ratchaburi Electricity Generating Company Limited						
Development of employee capabilities in core competency	Core competency	6	36.5	57	70	88,000
Development of employee capabilities in leadership competency	Leadership competency	9	158	38	38	888,990
Development of employee capabilities in job competencies	Functional behavior	6	26	53	71	3,890
	Functional technical	22	365	41	21	402,275
RATCH-Cogeneration Company Limited						
Development of employee capabilities in core competency	Core competency	1	16	1	0	3,120
Development of employee capabilities in job family competencies	Functional technical	3	26	6	2	41,400
RATCH-Australia Corporation Pty. Ltd.						
Development of employee capabilities in core competency	Core competency	7	342	7	2	162,908
Development of employee capabilities in leadership competency	Leadership competency	1	76	2	0	15,458
Development of employee capabilities in job competencies	Functional behavior	1	38	0	1	13,798
	Functional technical	8	380	8	3	220,006

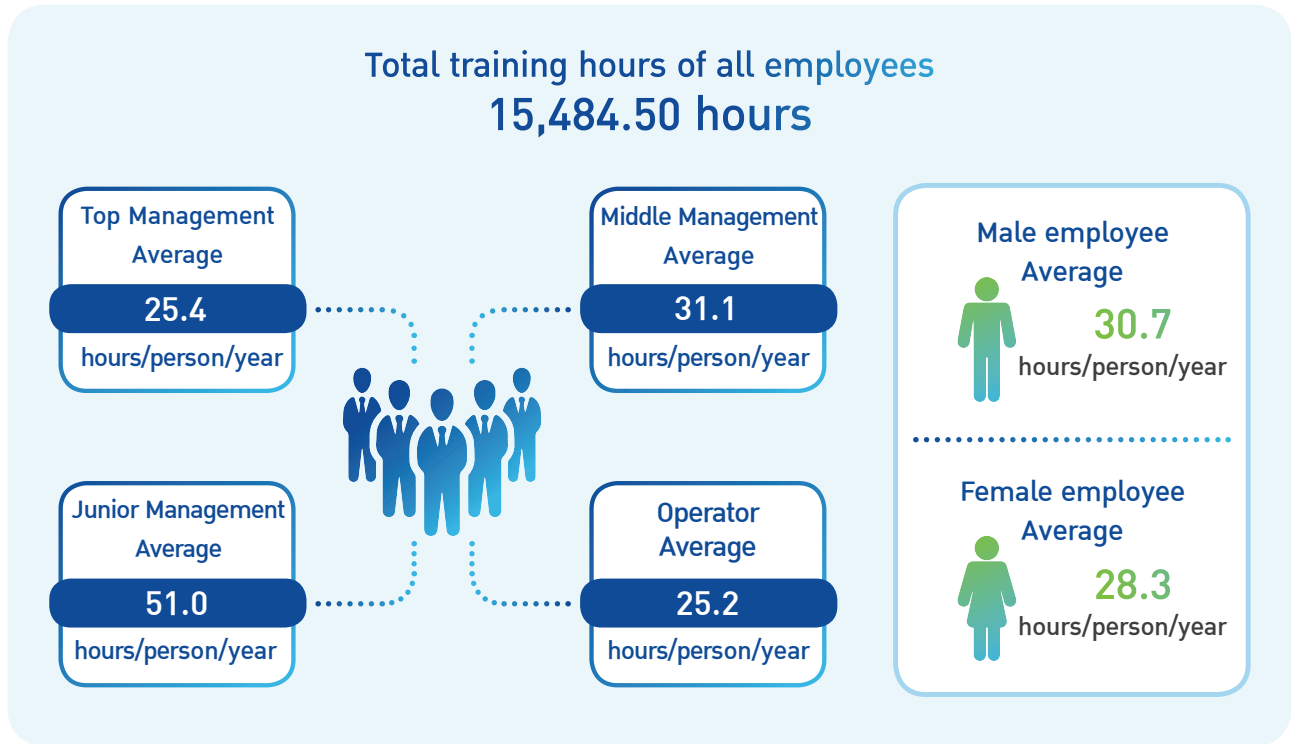
Course	Type of competency	No. of courses	No. of hours	No. of attendees		Expenses (Baht)
				Male	Female	
RATCH-Lao Services Company Limited						
Development of employee capabilities in core competency	Core competency	4	32	151	3	44,659.20 (expenses for 1 program: other programs were organized by Hongsa Power Plant)
Development of employee capabilities in job family competencies	Functional behavior	1	8	70	0	
	Functional technical	8	64	393	0	

Number and Levels of attendees

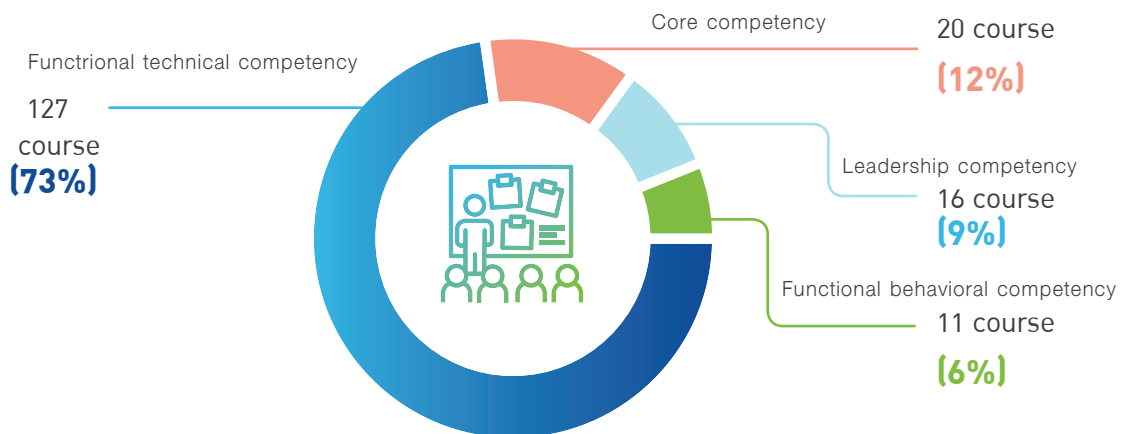
Level	% of workforce attending training		No. of training hours		Training hour/person/year	
	Male	Female	Male	Female	Male	Female
RATCH Group Public Company Limited						
Top Management	77.8	100.0	230.5	55.0	26.3	27.5
Middle Management	86.2	100.0	991.5	456.5	34.4	32.6
Junior Management	100.0	94.1	1,268.0	1,484.0	37.5	44.3
Operator	88.9	100.0	1,087.0	1,248.0	23.0	21.2
Ratchaburi Electricity Generating Company Limited						
Top Management	100.0	0	71.0	0.0	35.5	0
Middle Management	100.0	100.0	200.0	79.0	100.0	79.0
Junior Management	100.0	100.0	571.0	457.0	95.2	96.2
Operator	100.0	100.0	841.0	664.0	56.1	36.9
RATCH-Lao Services Company Limited						
Top Management	0	0	0	0	0	0
Middle Management	0	0	0	0	0	0
Junior Management	0	0	0	0	0	0
Operator	100.0	14.3	4,912.0	24.0	25.3	8.0
RATCH-Cogeneration Company Limited						
Top Management	0	0	0	0	0	0
Middle Management	0	0	0	0	0	0
Junior Management	100.0	0	7.0	0	7.0	0
Operator	100.0	33.3	26.0	14.0	4.3	7.0
RATCH-Australia Corporation Pty. Ltd.						
Top Management	100.0	100.0	114.0	38.0	38.0	38.0
Middle Management	100.0	0	76.0	0	38.0	0
Junior Management	100.0	100.0	304.0	38.0	38.0	38.0
Operator	100.0	100.0	152.0	76.0	38.0	38.0
Average training expense (Baht/capita)	13,700					

Remark : The training hours and expenses of RATCH's secondees as top management of Ratchaburi Electricity Generating Co., Ltd., RATCH-Lao Services Co., Ltd., RATCH-Cogeneration Co., Ltd., and RATCH-Australia and as middle management in RATCH-Australia and RATCH-Cogeneration are included in RATCH Group's figures.

Results of training in 2022



Number of training courses by type of capacity



Knowledge development

RATCH emphasized internal knowledge sharing by internal experts in various fields and employees and job operators are encouraged to learn from the experts. The knowledge sharing not only quickens the learning curve and warrants greater efficiency, it also preserves and pass on the knowledge-considered the company's valuable assets-to the next generation. Organized every year, knowledge sharing activities also promote the learning culture and employee relationship.

knowledge sharing activities in 2022

Topic	Objective and content summary	No. of attendees	% of applicability in daily routines (medium-high)	Benefits
Construction of Nexif RATCH Energy Rayong	<ul style="list-style-type: none"> • Management of contracts relating to power plant construction • Building relationship with stakeholders • Guidelines on the analysis and solving of construction-related issues 	46	96.7	<ul style="list-style-type: none"> • Understand the management of EPC contracts and project development process as guided by development plans • Apply the concepts in planning and problem diagnosis/solving in daily routines • Learn about the execution of ESG principles • Learn about relationship building with suppliers, understand the process and apply it in daily routines • Learn about and apply the construction experiences in daily routines as well as techniques as they see fit • Learn how to tackle construction delays
Success Tips for Contract Management	<ul style="list-style-type: none"> • Techniques on contract preparation and administration • Contract management • Key issues to consider • Samples of retaliation and conflict resolution 	46	96.0	<ul style="list-style-type: none"> • Learn and know issues to consider in contract administration and management • Get the right knowledge for the given job concerning construction project management • Apply with the preparation of other contracts or in reaching agreements with suppliers for continuous progress • Use it as guidelines in scrutinizing contracts and applying conditions in future work • Apply the knowledge with the internal audit system
Get to Know Digital Assets	<ul style="list-style-type: none"> • Background of digital asset investment • Using of digital assets for business • Protection measures for data concerning digital assets 	44	91.7	<ul style="list-style-type: none"> • Basic knowledge for the designing of business activities and new investment options as well as digital asset investment • Asset digitization • Knowledge for the protection of data concerning digital assets

Knowledge Sharing activities at Ratchaburi Power Plant

Topic	Objective and content summary	No. of attendees	% of applicability in daily routines (medium-high)	Benefits
1) Experience in SPP power plant management	<ul style="list-style-type: none"> Management principles for cogeneration SPP power plants Similarities and differences in SPP and IPP management 	38	97.7	Understanding in the operations and key issues of SPP and IPP
2) Why stop the thermal power plant, after 25 years?	Restrictions on further development of Ratchaburi Thermal Power Plant after the end of PPA in 2025			Understanding in Thailand's electricity generation industry and PDP that shows opportunities and/or limitations on power plant development
3) Listening tips	Tips to improve listening skills, a key component of efficient communications	33		Techniques to improve listening skills for daily life and work
4) Experiences matter	Tips to enhance knowledge and understanding in the direction, process and practices on corporate finance			<ul style="list-style-type: none"> Knowledge in the organization's financial management principles that are geared towards the best benefits for employees, the organization and external parties Knowledge in various payment methods, to facilitate documentation according to the company rules for faster payments
5) RG: Past to Present	The organization's accounting and finance principles and key milestones	35		Understanding in the accounting/finance concept and operational protocols to facilitate coordination and accounting/finance operations accordingly to the company rules for faster outcomes
6) Winning community supports	Extending knowledge on the company's community relations for 9 neighboring Sub-districts for their acceptance and peaceful coexistence			Understanding in the objectives and targets of community relations as well as tools applied in building relationships with stakeholders
7) O&M management	Ratchaburi Power Plant's concept and principles on operations and maintenance	40		Understanding in the O&M objectives and targets, management approaches and key issues of the thermal and combined cycle power plants, for the application in daily routines
8) What it took to enter (power plants)?	Enhancement of understanding in power plants' security concept and goals			Understanding in the objectives and goals concerning power plants' security for proper compliance among job operators working at the sites and visitors who shall follow the power plants' access-control procedures

Employee training courses

Topic	Digital assets
Content summary	<ul style="list-style-type: none"> • Blockchain principles • Knowledge in digital assets • Knowledge in non-fungible token for business applications • Sample business applications of digital assets in Thailand and abroad
Benefits	<ul style="list-style-type: none"> • No. of attendees: 44 persons • Evaluation score on understanding and gained benefits: 91.7%

Topic	Change, Disrupt and Growth
Content summary	<ul style="list-style-type: none"> • Change analysis and assessment • Setting strategies in changing environment in response to changes • Studying tools necessary for the analysis of changes and disruptions as well as the assessment of uncertainties in the industry
Benefits	<ul style="list-style-type: none"> • Attendees were numbered 38 and evaluation score on understanding 83.26% (All are required to score 70 points to pass the test.)

Fair treatment of labor

Fair employment

RATCH enforced the Regulation on Personnel Management that fully entailed labor standards. The regulation served as the basis for transparent, fair and equitable treatment of labor, for the morale of employees.

Key provisions in Regulation on Personnel Management



- It is clearly specified that the company shall not hire persons aged below 18 years or child labor. The company shall give an equitable opportunity to all individuals qualified and competent for the particular position, regardless of their gender, race, religion and social status. Meanwhile, the hiring of employees and/or probationary employees shall be implemented within the Board of Directors-endorsed manpower planning.

Employment of RATCH and operational controlled entities in 2022



Turnover rate in 2022



Details in Performance data Page 250

- Employee career advancement is a key consideration for promotion and up ranking. The criteria are clearly specified, giving weight chiefly to employees' competency and potential.

Fair remuneration

RATCH outlined a transparent, fair and non-discriminatory remuneration policy. The remuneration and welfare structure has been reviewed continuously and regularly for compliance with labor laws and comparable with those of its peer group, to retain employees and attract new talents.

Salary	Compared to average minimum wage (times)	Compared to Nonthaburi Province's minimum wage (times)
Entry-level salary for employees with diploma degrees	1.51	1.51
Salary for employees with bachelor degrees	2.00	2.00
Salary for employees with master's degrees	1.83	1.83

Treatment of employees working in foreign countries

RATCH has presence in many countries and the operating area tends to expand continuously. As such, an emphasis is placed on the remuneration and welfare for employees working in foreign countries, factoring in risks, cost of living, inflation and economic conditions. Besides, the company ensures positive living conditions for the employees, to strengthen employee engagement and support overseas posting and employees' on-the-job training at subsidiaries abroad.

Welfare for employees working in foreign countries

Welfare	Details
Expatriate Allowance	Monthly allowance for employees working overseas, based on the cost of living in a particular country
Extra Cost of Living Allowance	Additional allowance if the employees are accompanied by spouses or children
Living Quarters Allowance	Accommodation expenses during the working period, for the accommodation provided by the company or selected by employees
Children Education Allowance	Applicable to 3-year-old children until they finish high-school education or equivalent
Vehicle Allowance	Travelling expenses necessary for their jobs
Moving – in – Out Allowance	Expenses for the moving of their belongings in and out of the country where they are posted
Home Leave	Financial support for the employees' returning home 3 times a year, inclusive of arrival and departure travel expenses
Compassionate Leave	Financial support for the employees' emergency home return in the event of sickness or departure of their parent, spouse or children and travel expenses
Life and Accident Insurance	Life and accident insurance with coverage worth at least Baht 2 million
Annual Leave	Permission to take leave as stated by the laws in the particular country and the regulation of the company they are working for.

RATCH also prepares emergency assistance for employees working overseas including medical assistance, assistance where safety is concerned, and emergency information and alert in the face of outbreaks, earthquakes, and similar events.

Career advancement

RATCH has the personnel development plan to improve competencies and prepare qualified employees for executive posts—from manager to department head, executive vice president and higher, so as to ensure business continuity and a smooth ride towards business goals.



Employee capability development approach



Capability building for successors

- Prepare successors to retiring high-level executives: 1 high-level executive retired in 2022.

Item	2022	2023	2024	2025	2026
No. of retiring executive-level employees	1	1	0	0	1

- Training for junior executives to prepare them for middle-management positions.

Type of course	No.	Course	Total training hours	Attendees		Expenses (Baht)
				Male	Female	
Capacity development	1	Change, Disruption and Growth	18	17	21	361,660
	2	Communication Set for Manager	12	14	12	154,080
	3	Leadership Awareness	24	31	34	344,000
	4	The Great Workplace Personality & Influencing at Work	12	10	12	96,300
Total			66	72	79	956,040

The 3-year capacity development for manager level program is a process of searching for the talents who have the best functional behavioral and technical competency in line with the company's criteria that suits for succeeding the middle management positions.

In 2022, 4 training courses were organized for 151 junior management-level candidates. The post-test score averaged at 82.60%.

Performance appraisal

RATCH conducts the annual performance evaluation for all employees, via the Human Resources Information System (HRIS). Evaluators are the employees' supervisors in the chain of command.

Evaluation criteria	Follow-up	Evaluation
<ul style="list-style-type: none"> Organization KPIs: 10% Function KPIs: 10% Division KPIs: 10% Department KPIs: 20% Individual KPIs: 30% Corporation and participation in the company's activities: 10% Competency assessment: 10% 	<ul style="list-style-type: none"> Regular Performance reports Feedback and recommendations on implementation 	<ul style="list-style-type: none"> An annual performance appraisal Analyze the past performance results and set future plan

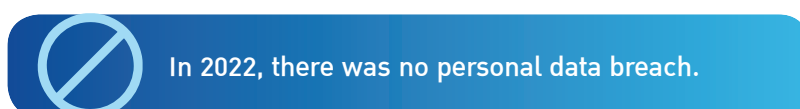
The annual appraisal results are the basis of determining annual salary increases and bonuses and the planning of human resource management and development.

Performance in 2022

- 100% of employees were evaluated for their performance corresponding with the organization's goals.

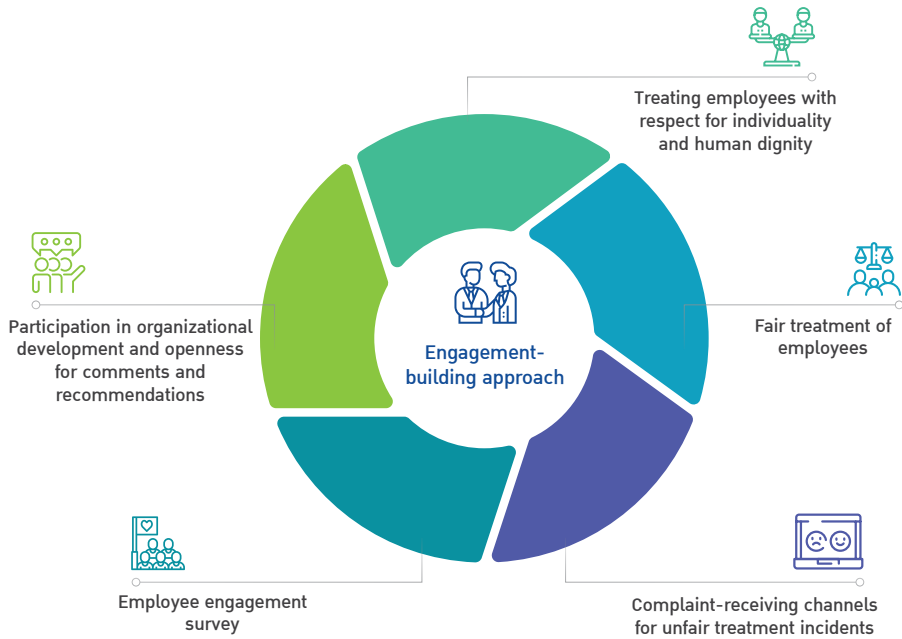
Employee Personal Data Protection

In 2022, RATCH outlined the detailed guidelines on personal data protection, covering that of employees, job applicants and all stakeholder groups published on the company's website (read more details in the topic of Corporate Good Governance). The data of candidates and employees who resigned are stored as much as necessary. However, employees who resigned are obligated to protect the confidential information of the company, the company's customers and other individuals obtained during their service periods.



Building Engagement

Human resources are essential to all organizations. Employees who perform duties at their best and are loyal will propel their organization's growth. In the past year, RATCH created the engagement-building plans for each function, expecting executives to build relationship with subordinates and a stronger unity.



Approach	Objective	Target	Results
Participation in organizational development and openness for comments and recommendations	<ul style="list-style-type: none"> Promote employee's engagement in organizational development by providing opinions or recommendations about operating process improvement through regular two-way communications channels such as employee meetings and functional meetings. Establish communications channels to receive employees' opinions or suggestions, such as opinion boxes, Intranet and email, and use them as input for the shaping of improvement plans. Organize activities to strengthen employee relationships in functional and organizational levels as a way to communicate and promote mutual understanding. 	Their recommendations are appropriately responded to	No recommendations from employees in 2022
Treating employees with respect for individuality and human dignity	<ul style="list-style-type: none"> Treat employees with fairness, equitability and respect regardless of gender, age, nationality and religion, and with respect for their basic rights and freedom as stipulated in the Constitution. Follow the zero tolerance policy regarding child, illegal and forced labor. Establish the Welfare Committee that comprises the employer' and employees' representatives, as a respect to employees' freedom of association. 	At least 5 employees are represented in the Welfare Committee	11 elected employees are a member of the Welfare Committee, representing 5.56% of total employees

Approach	Objective	Target	Results
Fair treatment of employees	<ul style="list-style-type: none"> Establish standard evaluation system, human resource development plan and career advancement plan, with continual communication with employees for their understanding. Set appeal criteria under which employees can launch appeals against unfair treatment and establish complaint-receiving channels and retaliation protection measures for complainants. 	Handle/remedy complaints and consider appeal within timeframe specified in the regulation on personnel management	No complaint was received.
Complaint-receiving channels for unfair treatment incidents	<ul style="list-style-type: none"> Allow employees with work-related troubles or distress concerning work conditions, employment conditions, command, job assignments, payments or other benefits to file complaints to direct supervisors or higher-ranked supervisors in the line of command or use the company's web-based complaint channel. Allow employees to lodge an appeal against the company's disciplinary actions within 15 days upon acknowledging the actions. If the actions concern direct supervisors, employees may appeal to higher-ranked supervisors in the line of command. In case of job termination, the appeal should go to the Board of Directors within 30 days upon acknowledging the actions. 		
Employee engagement survey	<ul style="list-style-type: none"> Conduct the employee engagement survey annually: RATCH has been conducting the annual survey since 2017 and results are the basis for the designing of engagement activities within function groups or at the organizational level. 	Engagement rate is maintained at 80%	Engagement rate was at 82.56%

In 2022, RATCH and Ratchaburi Electricity Generation Co., Ltd., its subsidiary that contributed 73.6% of revenue, conducted the employee satisfaction and engagement survey with assistance from an external agency. The survey result was expected to be at least 80%.

Performance in 2022

- 2 organizational-level engagement activity was organized.
- 40 activities at the functional level were organized.
- Employee engagement rate was at 82.56%, compared to 80.53% in 2021



Employee participation

Opportunity for expression

RATCH has established the Welfare Committee to represent employees (the employed) and a stage for discussion with the Management (the employer) on welfare provision. The committee members are elected as stipulated in the Department of Welfare and Labor Protection’s Notification on welfare committee election criteria and methods B.E. 2545 (14 May).

In 2022, RATCH and controlled entities established the Welfare Committee and the number of employee representatives is as follows:

	RATCH Group Public Company Limited	Ratchaburi Electricity Generating Co., Ltd.
No. of committee members (persons)	6	5
% of employees sitting in the committee	3.6	16.1

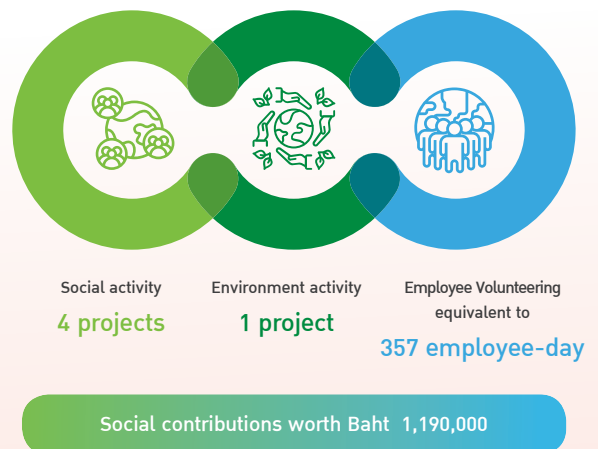
Regarding other subsidiaries employing fewer than 50 staff, their employees were allowed to independently express their opinions through various channels—corporate meetings, sessions with executives, relationship building activities, annual seminars and opinion boxes. All subsidiaries applied the company’s human resource management and remuneration and welfare setting standards.

Responses to employee representatives’ proposals

- Raising maximum limit of OPD and IPD treatment covering employees, their spouse and 2 children under legal age.
- Increasing annual health check-up benefit for employees of all age ranges, including dental and eye care, as well as vaccination.

Giving back to society

RATCH encourages and promotes volunteering, urging employees to provide public services with concerns about society and the environment. The employees are expected to be both good and smart members of society. In 2022, the company organized social activities that employees could participate at their own will and they could use volunteer time off for volunteering services.

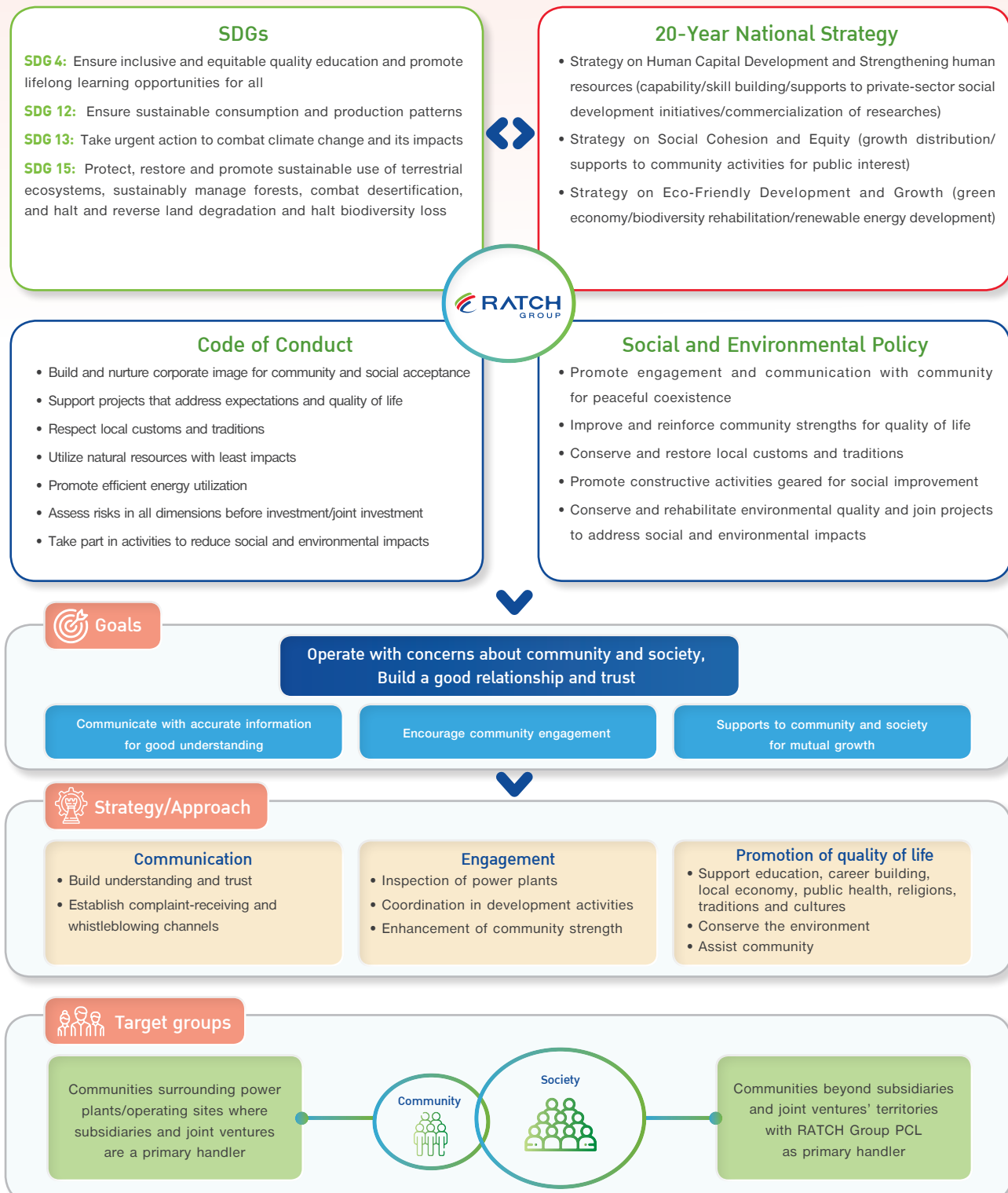


Community and Social Stewardship



Aside from favorable financial performance, contribution to economic growth and environmental stewardship, being responsible for community and society where we operate is a must on our path to become a leading value-oriented energy and infrastructure company in Asia Pacific. That encompasses supports to society at large in the areas that the company are capable of, to pave way for continued business operations and sustainable care for the environment, community and society.

Community and Social Accountability Framework



Performance in 2022

Communication for Understanding and Trust in the Operations

Electricity generating, the company’s main business, can contribute both a positive impact to the company in terms of business values and negative impacts concerning resource utilization and pollutant emissions that will first affect communities surrounding power plants and the environment. All power plants thus conduct environmental impact assessment, establish preventive and rectifying measures as well as impact monitoring measures, and carry out risk assessments that will prevent and reduce impacts from the designing, construction, production, maintenance and decommissioning stages. This is to ensure minimum impacts on community, society and the environment and compliance with all relevant standards, regulations and laws.

Nevertheless, despite all standards, regulations and laws, community and society at large remain anxious about power plants and continuous communication will play a role in building trust. Realizing the importance, the Company Group has drawn up an accessible and continuous communication process, taking it as a tool to distribute information and receive complaints on the operations. Such will help them promptly tackle problems and maintain community and society’s trust in the organization. All power plants also put in place the systematic and efficient remediation process and timeline, on top of the environmental management system. The information contained in the communication plans of RATCH operational-controlled power plants, altogether 34 (contributing 98% of total revenue), is as follows:

1. Building Trust and Confidence

Project/ Activity	Objective	Actions	Results
Ratchaburi Electricity Generating Co., Ltd.			
Communication via social media channels	<ul style="list-style-type: none"> Publicize information, contents, knowledge and power plant’s activities for accurate understanding in the operations. 	<ul style="list-style-type: none"> Communicate via Facebook Fan Page Our home by Ratchaburi Power Plant 4 times a week Publish RG. Weekly News and RG. Scoop News on LINE Application 	<ul style="list-style-type: none"> The Fan Page had 32,451 followers (as of 8th December 2022), a 3.13% increase over 2021. 44 Issues of RG. Weekly News 44 editions of RG. Scoop News
Relationship-building communication	<ul style="list-style-type: none"> Boost relationship and confidence in the operations Inform and educate community leaders in nine target sub-districts about the production process and environmental management 	<ul style="list-style-type: none"> Organize nine activities in nine sub-districts 	<ul style="list-style-type: none"> The activities drew 332 attendees. The attendees’ satisfaction score was 90.02%.

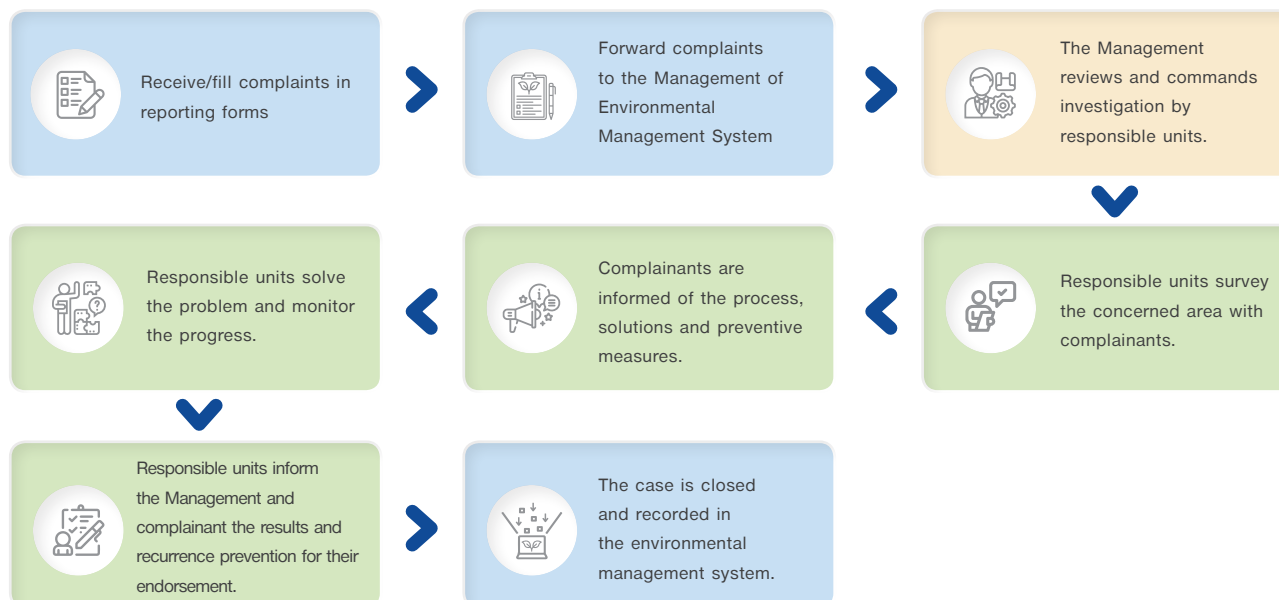
Project/Activity	Objective	Actions	Results
Information for community leaders and government offices	<ul style="list-style-type: none"> Inform community leaders in advance of the power plant's activities that may cause impacts/ concerns including fuel switch and transportation of diesel/bunker oil or limestone and gypsum 	<ul style="list-style-type: none"> Send 31 letters (as of 8 December 2022) containing the power plant's activities to government offices in Ratchaburi Province Post the letters on the LINE group chat of each sub-district 	<ul style="list-style-type: none"> Community acknowledged and showed understanding in the operations. Community filed no complaint.
Display of environmental quality measurement results through screen at the power plant's entrance	<ul style="list-style-type: none"> Directly inform community of the power plant's data Demonstrate transparency in performance disclosure 	<ul style="list-style-type: none"> Install a screen at the power plant's entrance 	<ul style="list-style-type: none"> Community showed acknowledgement and better understanding in the operations.
Preparation of annual environmental management report	<ul style="list-style-type: none"> Publicize the actions on environmental impact management as specified in EIA, the environmental management results (air, noise, water and waste), and community relations activities 	<ul style="list-style-type: none"> Prepare the annual report and distribute the report to 695 target offices 	<ul style="list-style-type: none"> Target recipients/community acknowledged the environmental management actions as specified in EIA and the results. No complaint was filed.
Friend's Visit Project for sub-districts beyond the 9 neighboring sub-districts	<ul style="list-style-type: none"> Build knowledge, understanding and trust on electricity generation process through the end of PPA, environmental management and community development initiatives for a group of educational personnel Ensure the group get the right knowledge for further information dissemination 	<ul style="list-style-type: none"> Knowledge session for educational personnel in Ratchaburi Province 	<ul style="list-style-type: none"> Ratchaburi's school executives and other personnel understand the generation process, environmental management and community development initiatives. The session welcomed 151 attendees and overall satisfaction score was 89.76%.
RATCH Cogeneration Co., Ltd.			
Communications via online media	<ul style="list-style-type: none"> Publicize the power plant's operational information to government offices/community leaders and members of nearby communities to win their confidence and demonstrate operational transparency 	<ul style="list-style-type: none"> Use LINE application and community broadcasting system for periodic announcements Post announcements at government offices and in nearby communities Tri-annually announcements to community and government in expansion construction phase 	<ul style="list-style-type: none"> Community acknowledged and showed understanding in the operations. No complaint was filed.
Preparation of environmental management report	<ul style="list-style-type: none"> Raise confidence among stakeholders in the power plant's environmental management and relations activities 	<ul style="list-style-type: none"> Prepare the biannual report and distribution to target groups within 3-5 km radius from the power plant Tri-Partite Committee's meeting in every quarter 	<ul style="list-style-type: none"> Target groups/community acknowledged the environment management actions as specified in EIA and the results. No complaint was filed.

Project/ Activity	Objective	Actions	Results
Exhibition on power plant's operations	<ul style="list-style-type: none"> Present knowledge on energy, the environment and electricity generation to the youth in neighboring communities 	<ul style="list-style-type: none"> An exhibition booth at Thammasat Klongluang Witayakom School's event entitled "Fine arts, Languages and Science" to promote knowledge in renewable energy and energy saving 	<ul style="list-style-type: none"> The youth and the interested gained more knowledge on energy, the environment and electricity generation. The understanding in the operations promoted positive awareness.
Study Trip at Berkprai Cogeneration Power Plant	<ul style="list-style-type: none"> Promote the right knowledge on power plant operations for the Tri-Partite Committee's members and local residents 	<ul style="list-style-type: none"> A visit to observe the production process of Berkprai Cogeneration Power Plant in Ratchaburi Province 	<ul style="list-style-type: none"> The attendees learnt about another SPP Power plant's operations and gained more knowledge, which further builds trust and promote coexistence.
Nava Nakorn Electricity Generating Co., Ltd.			
Communications via online media	<ul style="list-style-type: none"> Disclose the power plant's operational information to relevant stakeholders, to build confidence and demonstrate transparency 	<ul style="list-style-type: none"> Use LINE application as the medium to disclose the information 	<ul style="list-style-type: none"> Stakeholders acknowledged and showed understanding in the operations. No complaint was filed.
Preparation of environmental management report	<ul style="list-style-type: none"> Publicize the actions in accordance with EIA measures and the results of environmental management (air, noise, water and waste) as well as relations activities 	<ul style="list-style-type: none"> Prepare and send report to target groups 	<ul style="list-style-type: none"> Target groups/community acknowledged the environment management actions as specified in EIA and the results. No complaint was filed.
Knowledge sharing activity on air quality measurement for 2022	<ul style="list-style-type: none"> Promote knowledge, understanding and trust in the operations for the Environmental Inspectors Committee and the interested public Promote the right knowledge on environmental quality measurement and engagement in environmental inspection 	<ul style="list-style-type: none"> Training the attendees on air quality and noise measurement 	<ul style="list-style-type: none"> The attendees learnt more about approaches of air and noise quality measurement and had trust in the operations. The satisfaction score for this activity was 89.51%.
2022 Open House for Tambon Phra Intharacha Municipality	<ul style="list-style-type: none"> Build knowledge and understanding in the electricity and steam generation process that demonstrates efficiency and safety/environmental supervision Build relationship with government offices and community 	<ul style="list-style-type: none"> Open for the target group to study the power plant's operation in order to promote better understanding 	<ul style="list-style-type: none"> Participants gained knowledge and understanding in the electricity and steam generation process, environmental and safety governance. The satisfaction score was 86.95%.
Berkprai Cogeneration Co., Ltd.			
Communications via social media	<ul style="list-style-type: none"> Communicate and disclose the power plant's operational information to stakeholders to build confidence and affirm transparency 	<ul style="list-style-type: none"> Use LINE application, community broadcasting system and corporate releases for the announcements at Berkprai Sub-district 	<ul style="list-style-type: none"> Community acknowledged and understood the power plant's operations. No complaint was filed.

Project/ Activity	Objective	Actions	Results
Installation of opinion boxes in community areas	<ul style="list-style-type: none"> Increase channels to hear community opinions and suggestions 	<ul style="list-style-type: none"> Installation of 2 opinion boxes and Community Relations Division tasked to gathered the opinions every month for monthly operational reports, to be submitted to the Management 	<ul style="list-style-type: none"> No complaint was received.
Preparation of environmental management report	<ul style="list-style-type: none"> Publicize the actions in accordance with EIA measures and the results of environmental management (air, noise, water and waste) as well as relations activities 	<ul style="list-style-type: none"> Biannually prepare and publicize the report to target groups which are Moo 6, 7 and 8 of Berkprai Sub-district, Ban Pong District, Ratchaburi Province and Tambon Berkprai Municipality 	<ul style="list-style-type: none"> Target groups/community acknowledged the environment management actions as specified in EIA and the results. No complaint was filed.
Sahacogen (Chonburi) PCL.			
Green Energy Newsletter	<ul style="list-style-type: none"> Publicize the company's activities internally (within Sahacogen Group) and externally (covering suppliers, customers and community) 	<ul style="list-style-type: none"> Prepare quarterly Green Energy Newsletters, containing general interesting information and its power plants' operations 	<ul style="list-style-type: none"> Four newsletters per year were sent to target recipients. Target recipients/ community were informed about its power plants' operations and general interesting information.
Communications via local newspapers	<ul style="list-style-type: none"> Publicize the company's operations to external parties (suppliers, customers and community) 	<ul style="list-style-type: none"> Prepare monthly reports on its power plants' activities and distribute the reports twice a month to local newspapers - Chonburi Post, Lamphun Media, Lamphun News and Lek Phet News - once/twice a month. 	<ul style="list-style-type: none"> Target recipients/ community were informed about its power plants' operations and general interesting information.
Communications via Facebook Page: SAHACOGEN	<ul style="list-style-type: none"> Increase communications channels to extend knowledge to community Ensure the right understanding in power plants' operations and good image in the community 	<ul style="list-style-type: none"> At least 3 postings a month on Facebook Page: SAHACOGEN 	<ul style="list-style-type: none"> Target recipients/ community were informed about its power plants' operations and general interesting information. The page had 409 followers (as of 30 Nov. 2022).
Complaint receiving and correction process	<ul style="list-style-type: none"> Communicate with community, the general public or external organizations and receive their complaints related to issues possibly caused by the company's operations for prompt correction and impact mitigation 	<ul style="list-style-type: none"> Prepare readiness of the complaint receiving and investigation process 	<ul style="list-style-type: none"> No complaint was received.
Open House activity	<ul style="list-style-type: none"> Promote knowledge and understanding in the generation process, environmental management and community stewardship 	<ul style="list-style-type: none"> Organize the annual Open House activity for community representatives and the interested 	<ul style="list-style-type: none"> Neighboring community gained knowledge and understanding in the eco-friendly generation process, safety management and community engagement.

2. Remediation and Grievance Mechanism

The company's power plants have established grievance channels through which community can file their opinions or complaints around the clock. The channels are the Community Relations Unit and/or community leaders or the tri-partite committee as well as telephone, opinion box, email, postal mail, LINE group chat, and mobile-phone short messages (SMS). The remediation and grievance mechanism was developed in line with the ISO 14001 standard for environmental management system standard. In 2022, all the power plants received zero complaint from all grievance channels.



Community Engagement

1. Inspection of Power Plants

Relevant stakeholders are welcomed to take part in the inspection of power plants, which are the company's main business. Their engagement is possible through Environmental Inspectors Committee, Tri-Partite Committee, the joint committee on operational inspection and community development, etc. The performance in 2022 is summarized below:

Ratchaburi Electricity Generating Co., Ltd.	
Committee in action	The Environmental Inspectors Committee
Detail	Established on 24 September 2022 (a new committee was formed in 2022), with 25 members representing the neighboring community, government offices, civil society and the power plant's representatives.
Performance	<ul style="list-style-type: none"> The committee followed up on the power plant's compliance with the environmental impact preventive and corrective measures and the power plant's action plan on environmental quality monitoring as stated in the EIA. The committee coordinated with the power plant for environmental operations inspection; and presented data, information, facts and recommendations on environmental management to the community's joint committee on operational inspection and environment development. The committee convened 2 meetings and joined a field trip.

RATCH Cogeneration Co., Ltd.	
Committee in action	The Tri-Partite Committee
Detail	Established on 8 June 2021, consisting of 45 members representing neighboring community, government offices, and the power plant.
Performance	<ul style="list-style-type: none"> The committee convened 4 meetings. The committee joined the first inspection and analysis of environmental impacts from the extension project and the power plant's operations for compliance with the EIA, based on the performance report on the implementation of environmental impact preventive and corrective measures. The committee joined a field trip to Berkprai Cogeneration Power Plant in Ratchaburi Province, to promote their knowledge and understanding in the SPP that shared RATCH Cogeneration Power Plant's practices; and community relations.
Nava Nakorn Electricity Generating Co., Ltd.	
Committee in action	The joint committee on operational inspection and community development
Detail	Consisting of 29 members representing neighboring community, government offices, civil society and the power plant's representatives.
Performance	<ul style="list-style-type: none"> The committee convened 2 meetings. The results of environmental, safety and community relations performance were presented at the meetings as well as opinions on the company's operations.
Berkprai Cogeneration Co., Ltd.	
Committee in action	The Tri-Partite Committee
Detail	Established on 19th August 2021, with 24 members representing the neighboring community, government offices, civil group and the power plant's representatives.
Performance	<ul style="list-style-type: none"> The committee convened 2 meetings to hear the results of the implementation of EIA measures and community engagement activities. The committee joined the 2022 field trip to Mae Moh Power Plant in Lampang Province, as part of the initiative to promote members' knowledge and strengthen the committee's capabilities. The committee joined Ratchaburi Province's Eco Industrial Town steering committee.
Sahacogen (Chonburi) PCL.	
Committee in action	The Inspection Committee
Detail	Represented by relevant government offices, the general public, local leaders and executives, and other organizations.
Performance	<ul style="list-style-type: none"> The committee convened 2 meetings in the year. The committee followed up on the operations, the problem-solving process involving community and government offices as stated in the EIA and changes in project details. The committee followed up on the construction of Sahacogen combined cycle power plant.
Committee in action	The Inspection Committee for the biomass power plant (by Sahagreen Forest Co., Ltd.) and the wood chip factory (by Siam Forestry Co., Ltd.)
Detail	Represented by relevant government offices, the general public, local leaders and executives, and other organizations.
Performance	<ul style="list-style-type: none"> The committee convened 8 meetings at 3 neighboring sub-districts - Khui Ban Ong, Wang Tabaeak and Khlong Phikrai. The meetings drew 157 attendees or 78.5% of target audience (of 200 attendees). The committee followed up on the operations, environmental and relationship-building activities and trust in the power plant's operations.

2. Collaboration in Development Activities

Collaboration in meeting development needs is extremely significant in ensuring that the company's supports to community social and development will properly address community and social needs. Community and society can notify the company of their needs through the aforementioned communication channels. Moreover, there are the tri-partite committees or community committees established as direct coordinators. In the electricity generating business in particular, power plants work closely with community committees in sustainably developing community and society. The development plan for each aspect, like career, education and public health, is prepared according to community needs. In place is the channels to hear community opinions/complaints, which will be inspected and corrected for sustainable results.

3. Enhancement of Community Immunity

In 2022, RATCH and communities jointly launched activities to strengthen their resilience to possible impacts particularly on safety; and preparation for the intensifying climate change and its direct impacts on communities.

Project	Objective	Actions	Results
Ratchaburi Electricity Generating Co., Ltd.			
Community disaster prevention and mitigation capability enhancement project	<ul style="list-style-type: none"> • Prepare relevant government officers for their operational guidelines and a channel to communicate with the power plant in case of disasters • Boost local authorities' readiness for possible disasters in terms of equipment and personnel • Raise confidence in the power plant's safety operations • Build relationship with community through joint activities 	<ul style="list-style-type: none"> • Organize a drill on disaster prevention and mitigation plan, engaging community in Ban Rai Sub-district 	<ul style="list-style-type: none"> • The disaster prevention and mitigation network was created, encompassing communities in 9 neighboring sub-districts, Damnoen Saduak Police Station, and relevant government offices in Ban Rai Sub-district. The drill was joined by 150 participants. • Survey showed 94.50% satisfaction in the project.
Nava Nakorn Electricity Generating Co., Ltd.			
Traffic signs	<ul style="list-style-type: none"> • Promote safety and prevent accidents in Wat Phuet Nimit Community where road conditions pose accident risks • Promote relationship with community 	<ul style="list-style-type: none"> • Install 2 traffic signs at Wat Phuet Nimit Community to prevent accidents 	<ul style="list-style-type: none"> • Road safety was promoted. • Accidents were prevented.
Berkprai Cogeneration Co., Ltd.			
Seven Days of Danger Safety Campaign during 2023 New Year period	<ul style="list-style-type: none"> • Promote road safety during the New Year festival • Give moral supports to duty officers 	<ul style="list-style-type: none"> • Hand out food and beverages at the four checkpoints in Suan Kluay, Nakornchum, Lad Bua Khao, and Tha Pha sub-districts. 	<ul style="list-style-type: none"> • The activity was joined by 120 participants. • Road safety during the New year festival was promoted. • Duty officers were motivated.

Promotion of Quality of Life

Throughout 2022, RATCH pursued a balance of business growth and value sharing with community through activities. Our goal is to establish favorable economic and social conditions, promote local learning, preserve customs and traditions as well as ensure the positive environment with sufficient basic infrastructure, for their quality of life.

Project/Activity	Objectives	Actions	Results (actual and expected)
RATCH Group PCL.			
Education for Career Empowerment Project in Lao PDR	<ul style="list-style-type: none"> Promote technical knowledge improvement for vocational students Support Lao PDR's educational strategy to create skilled labor Support SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all 	<ul style="list-style-type: none"> Organize Basic Wind Turbine training for Lao PDR's vocational teachers Organize a workshop for senior vocational students Improve the laboratories of 4 vocational colleges 	<ul style="list-style-type: none"> Teachers and students participating in the training and workshop gained more knowledge and skills. Vocational colleges have the laboratories that support learning by doing.
Love the Forest and the Community Project	<ul style="list-style-type: none"> Support the corporate sustainability strategy in social and environmental dimensions Support the corporate sustainability strategy in social and environmental dimensions Engage community with the management, development and rehabilitation so that forests can sustainably support community livelihood Encourage the utilization of prize money in further improving forest safeguarding and rehabilitation Support SDG 13: Take urgent action to combat climate change and its impacts 	<ul style="list-style-type: none"> Organize the annual 2022 Model Community Forest Competition Promote community forest management for sustainable development Promote community forest as natural classroom for forest-oriented education Raise awareness in the value of forests and support related activities that enhance community resilience to the climate change 	<ul style="list-style-type: none"> The competition attracted 1,105 community forests. Forests are rehabilitated and maintained by community, ably functioning as carbon sinks. Community forests gain increasing recognition, effectively drawing supports from more external organizations which further drive the success. The operations are replicated to nearby organizations and community forests, to raise knowledge and understanding in forest conservation and utilization of resources for extra income, for example, via the promotion of eco-tourism or distribution of community products. The project entails the youth through youth camps organized by winning community forests with their prize money, to raise the local youth's awareness on conservation.
Mangrove reforestation project, in collaboration with the Department of Marine and Coastal Resources, in Chanthaburi Province (113.47 rai)	<ul style="list-style-type: none"> Increase green areas for carbon sequestration Enhance mangrove ecosystem's biodiversity Support SDG 13: Climate action and SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development 	In the process of preparing the land for tree planting	<ul style="list-style-type: none"> To increase natural carbon sinks To enhance mangrove diversity in the project area

Project/Activity	Objectives	Actions	Results (actual and expected)
RATCH Group PCL. (continued)			
Reforestation project in collaboration with Royal Forest Department's Reforestation Promotion Office in Chanthaburi Province (500 rai)	<ul style="list-style-type: none"> • Increase green areas for carbon sequestration • Increase biodiversity of terrestrial forests • Support SDG 13 and SDG 14 	<ul style="list-style-type: none"> • In the process of land selection and preparation of project design document (PDD) and Co-Benefit report 	<ul style="list-style-type: none"> • To increase natural carbon sinks • To enhance the biodiversity of terrestrial forests in the project area
Plant Genetic Conservation Project under the royal initiative of HRH Princess Maha Chakri Sirindhorn	<ul style="list-style-type: none"> • Educate target groups about school botanical garden management and local natural resources • Establish the school botanical garden network and enhance the efficiency of network collaboration • Establish the local natural resource network and enhance the efficiency of network collaboration • Extend the knowledge about the project to target groups/ society, to raise awareness in national resource conservation 	<ul style="list-style-type: none"> • Organize workshops on school botanical gardens and local natural resources for school personnel and local government officers • Promote and host the project's 30th anniversary exhibition • Prepare the 7th five-year operational plan under the project's master plan and the annual operational plan for 2024 accounting year. 	<ul style="list-style-type: none"> • The workshops were attended by 249 people. • Improving knowledge score was 78-85% • Public awareness in the project grew following the 30th anniversary exhibition and publication on the company's website.
Community energy project in Yang Hak sub-district, Pak Tho District, Ratchaburi Province	<ul style="list-style-type: none"> • Raise awareness on energy optimization • Promote energy saving • Assist the development of community energy innovation from local resources • Support SDG 13 	<ul style="list-style-type: none"> • Provide solar-powered water pumps - Six 3,400-watt pumps and sixty 340-watt solar panels • Eight 600-watt pumps • Provide supports to 2 learning centers 	<ul style="list-style-type: none"> • The energy saving reduced carbon emissions by approximately 40.79 tCO₂e per year. • Household expenses were slashed by approximately Baht 330,778 per year.
Recyclable calendars	<ul style="list-style-type: none"> • Provide materials for the production of braille teaching tools for visually-impaired people 	<ul style="list-style-type: none"> • Donate old desk calendars collected by executives and employees to assist the Foundation for the Blind under the Royal Patronage of H.M. the Queen's production of teaching materials for visually-impaired people 	<ul style="list-style-type: none"> • A number of 252 old calendars were gathered and delivered to the foundation.
RATCH's supports to flood victims	<ul style="list-style-type: none"> • Help flood victims 	<ul style="list-style-type: none"> • Deliver survival packs prepared by executives and employees to flood victims in Bang Pho sub-district, Samkhok District, Pathum Thani Province 	<ul style="list-style-type: none"> • A number of 100 survival packs were delivered to flood victims.
Blood donation in honor of His Majesty the King	<ul style="list-style-type: none"> • Increase blood supply for the Thai Red Cross Society 	<ul style="list-style-type: none"> • Organize a blood donation event in honor of His Majesty the King with supports from the mobile units of Thai Red Cross Society and Central Chest Institute of Thailand 	<ul style="list-style-type: none"> • 42 executives and employees donated blood, amounting to 18,900 cc.

Project/Activity	Objectives	Actions	Results (actual and expected)
Ratchaburi Electricity Generating Co., Ltd.			
2022 Scholarship Project	<ul style="list-style-type: none"> To offer educational opportunities to the poor youth with good academic scores and good behavior To ease poor parents' expenses 	<ul style="list-style-type: none"> 504 scholarships worth Baht 1,007,400 were awarded to 14 schools. 	<ul style="list-style-type: none"> Students enjoy educational opportunities and can proceed with their studies. Scholarships reduced their family's expenses
CSR IN SCHOOL	<ul style="list-style-type: none"> To raise awareness in the network center's role and duty in supporting the activities of 27 networked schools located around Ratchaburi Power Plant To strengthen relationship with communities in target areas 	<ul style="list-style-type: none"> Training and seminar were hosted for the executives and educational personnel of 27 networked schools involved with the project. All 27 schools submitted reports/projects. 	<ul style="list-style-type: none"> The events were attended by 135 participants. Satisfaction score was 93.91%. Each of the networked schools received financial supports worth Baht 20,000 each, or a total of Baht 540,000.
For Our Home Project (Education Group)	<ul style="list-style-type: none"> To support self-development among school executives and educational personnel on skills and moral standards for career advancement To strengthen relationship with the school network and communities in target areas 	<ul style="list-style-type: none"> Training on Performance Agreement (PA) for teachers and school executives, for an upgrade in academic ranking. 	<ul style="list-style-type: none"> The training in 4 classes welcomed a total of 350 attendees. Satisfaction score was 95.46 %
Empowerment of development groups	<ul style="list-style-type: none"> To strengthen relationship with communities 	<ul style="list-style-type: none"> Field trips for Hed Khone Condo Group, Kowin Group and Ban Saphan Dam Learning Center Training on online marketing 	<ul style="list-style-type: none"> Field trips were organized for 38 members of the group and satisfaction score was 95.95%. The training had 17 attendees Satisfaction score was 94.67%.
Mobile medical and dental unit project	<ul style="list-style-type: none"> To offer continuous healthcare services to neighboring community To promote Thai traditional medicine and Thai herbs as well as self-reliance To build relationship with neighboring community 	<ul style="list-style-type: none"> Donate COVID-19 protection kits and survival kits to health centers in 9 sub-districts Organize traditional massage and other activities to promote health protection and rehabilitation 	<ul style="list-style-type: none"> Health centers received 1,000 ATK sets, 1,600 liters of alcohol, 1,000 PPE sets and 1,000 survival kits. The massage activity served 227 people.
For Our Home Project (Health Group)	<ul style="list-style-type: none"> To strengthen relationship with neighboring community To promote and enhance community To offer Thai traditional medicine as an alternative treatment for illness relating to muscles, tendons and bones To enhance community quality of life 	<ul style="list-style-type: none"> Training to equip public health personnel with professional skills relating to Thai traditional medicine 	<ul style="list-style-type: none"> Public health personnel were equipped with knowledge and professional skills relating to traditional medicine. The training had 24 attendees. Satisfaction score was 96.67%.

Project/Activity	Objectives	Actions	Results (actual and expected)
Ratchaburi Electricity Generating Co., Ltd. (continued)			
For Our Home Project (Religion Group)	<ul style="list-style-type: none"> To promote the food as medicine knowledge To extend the knowledge to Buddhist followers To promote, support and improve Buddhism studies 	<ul style="list-style-type: none"> Training for monks on “the role of food and diets in disease prevention” Preparation of offerings like drinking water, school supplies, etc. 	<ul style="list-style-type: none"> 120 monks attended the training. Drinking water, school supplies, etc. were given to the Pali Ecclesiastical Learning Project in Ratchaburi Province.
RATCH Cogeneration Co., Ltd.			
Supports to career training activities at Eua Arthorn km 44 Project, earmarked for the unemployed	<ul style="list-style-type: none"> To support knowledge enhancement and career activities at neighboring community To equip community members with knowledge and skills so that they can generate income and depend on themselves 	<ul style="list-style-type: none"> Provision of financial supports to community activities that promote knowledge enhancement and career building for the unemployed and the underprivileged 	<ul style="list-style-type: none"> At least 2 career-building activities are selected for financial supports per year, targeting communities in Tha Khlong Municipality.
Supports to training on volunteering for social development and human security	<ul style="list-style-type: none"> To uplift volunteering spirit and volunteers' capabilities in tackling community issues for the well-being of neighboring community 	<ul style="list-style-type: none"> Provision of financial supports to training on volunteering for social development and human security at Eua Arthorn Community, organized by social workers that want to improve the well-being through volunteering 	<ul style="list-style-type: none"> 1 training project received the financial support.
Provision of necessity items to COVID-19 patients and financial supports to Home Isolation preparation	<ul style="list-style-type: none"> To relieve the COVID-19 impacts on the patients and their families 	<ul style="list-style-type: none"> Provision of necessity items to COVID-19 patients and financial supports to Asian Institute of Technology's Home Isolation project, in collaboration with government offices in Tha Khlong Municipality 	<ul style="list-style-type: none"> The provision lessened impacts on COVID-19 patients. The provision helped ease a Home Isolation center's financial burden and shortages of consumer products.
Home maintenance for the poor	<ul style="list-style-type: none"> To repair the houses of poor, elderly and disabled people in neighboring community, for their own safety 	<ul style="list-style-type: none"> Provision of home repair service in the specified area, after consultation with Tha Khlong Municipality's community committee and government offices 	<ul style="list-style-type: none"> A number of 6 houses were repaired.

Project/Activity	Objectives	Actions	Results (actual and expected)
Nava Nakorn Electricity Generating Co., Ltd.			
2022 Scholarship Project	<ul style="list-style-type: none"> To offer educational opportunities to the poor youth with good academic scores and good behavior Encourage a sense of responsibility in the youth and motivate them to make good use of acquired knowledge 	<ul style="list-style-type: none"> Provision of 54 scholarships worth Baht 99,000 	<ul style="list-style-type: none"> Students enjoy educational opportunities and can proceed with their studies. Scholarships reduced their family's burden. Students are responsible for their duty and can improve themselves, their families and society.
Provision of medical equipment in 2022	<ul style="list-style-type: none"> To assist public health development 	<ul style="list-style-type: none"> Provision of medical equipment worth Baht 30,000 to Tambon Phayom Health Promotion Hospital 	<ul style="list-style-type: none"> The company took part in promoting the health of the general public. The hospital had sufficient equipment for its operations.
#7 Return Life to Water Project in 2022	<ul style="list-style-type: none"> Replenish the abundance and biodiversity in community water 	<ul style="list-style-type: none"> Provision of 20,000 baby fish to neighboring communities for release to Khlong Chiang Rak Noi 	<ul style="list-style-type: none"> The abundance and diversity of aquatic animals in the community's water channel has increased. Participating community members and students were numbered 79. Satisfaction score was 92.25%.
Khlong Chiang Rak Noi rehabilitation in 2022	<ul style="list-style-type: none"> To join public efforts in safeguarding Khlong Chiang Rak Noi 	<ul style="list-style-type: none"> Rehabilitation of Khlong Chiang Rak Noi with collaboration from community and local administrative offices (including Phra Intharacha Municipality's public health and environment division) 	<ul style="list-style-type: none"> The company took part in the campaign to safeguard Khlong Chiang Rak Noi. Participants' satisfaction score was 91.88%.
World Environment Day Activity	<ul style="list-style-type: none"> To raise environmental awareness among business owners and the general public 	<ul style="list-style-type: none"> Supports to Pathumthani's environmental rehabilitation club that hosted an activity to mark the World Environment Day on 5 June 2022 	<ul style="list-style-type: none"> Participants saw the necessity of environmental protection in their community and society at large.
Activity under National Mother Village Fund and Drug Prevention/ Rehabilitation Project	<ul style="list-style-type: none"> To campaign against drugs 	<ul style="list-style-type: none"> Provision of financial supports and snacks to the activity under National Mother Village Fund and Drug Prevention/ Rehabilitation Project by Moo 6, Chiang Rak Noi Sub-district, Bang Pa-In District, Ayutthaya Province 	<ul style="list-style-type: none"> The company took part in the campaign against drugs.
Dried food provision to flooded communities in 2022	<ul style="list-style-type: none"> To assist flooded communities 	<ul style="list-style-type: none"> Donation of rice and dried food by executives and employees for neighboring communities 	<ul style="list-style-type: none"> The company took part in helping society and easing flood impacts. Communities could deal with difficulties. Satisfaction score was 83.80%.

Project/Activity	Objectives	Actions	Results (actual and expected)
Berkprai Cogeneration Co., Ltd.			
Baby fish release and preservation of water source	<ul style="list-style-type: none"> To preserve aquatic animals in Mae Klong River To strengthen relationship with neighboring communities To commemorate King Rama IX's benevolence 	<ul style="list-style-type: none"> Provision of 20,000 baby fish for release to Mae Klong River: 95 people joined the activity 	<ul style="list-style-type: none"> The company helped restore Mae Klong River's abundance.
Water Bank Project to address Tha Pha Sub-district's polluted water	<ul style="list-style-type: none"> To equip community in Tha Pha Sub-district, Ban Pong District, Ratchaburi Province of knowledge on wastewater treatment 	<ul style="list-style-type: none"> Activating the Water Bank Project, to solve water pollution in Tha Pha Sub-district and enable sustainable water consumption 	<ul style="list-style-type: none"> 63 community members joined the activity. A water bank learning center was set up. Participants' satisfaction score was 96.78%.
School Lunch Project	<ul style="list-style-type: none"> To ensure the students in 4 schools - Wat Ladbuakhao School, Wat Hup Krating School, Wat Plak Raet School and Ladbuakhao Child Center - enjoy nutritious lunches throughout the academic year 	<ul style="list-style-type: none"> Provision of financial supports to the schools' lunch programs, to ensure proper nutrition 	<ul style="list-style-type: none"> The programs involved 320 people. The financial supports reached all target students. Participants' satisfaction score was 96.8%.
Livelihood development project under Self-Sufficiency Principles at Suankluay Sub-district	<ul style="list-style-type: none"> To promote and support community's self-improvement in line with self-sufficiency principles and community's capacity 	<ul style="list-style-type: none"> 3 training bases: 1) liquid soap making 2) making of dish washing liquid and 3) ribbon chick making, so that participants could extend the knowledge to others or produce in groups for sustainable income 	<ul style="list-style-type: none"> The training activity had 85 participants. The participants knew how to make liquid soap, dish washing liquid and ribbon chicks and could develop careers with the knowledge. Participants' satisfaction score was 97.81%.
Community landscape improvement project	<ul style="list-style-type: none"> To engage with community leaders To improve the community landscape To improve the community environment 	<ul style="list-style-type: none"> Community landscape improvement activities at Moo 6, 7 and 8 of Berkprai Sub-district, involving volunteering villagers and company staff who jointly cleaned canals, cut grass and clean village roads 	<ul style="list-style-type: none"> The activities attracted 80 volunteering villagers and company staff. The Moo 6, 7 and 8 of Berkprai Sub-district enjoyed a better environment

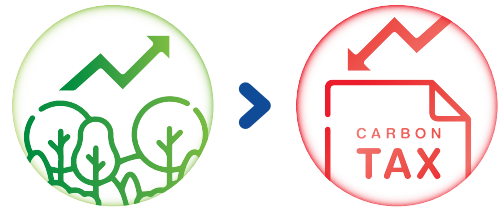
Project/Activity	Objectives	Actions	Results (actual and expected)
Sahacogen (Chonburi) PCL.			
Energy Arts Contest 2022 under the project to promote art skills and sustainable energy conservation	<ul style="list-style-type: none"> To support students' art skills and an exchange of experiences To promote and support student's artistic exercises with inserted knowledge about biomass power plant To instill positive attitudes towards the company 	<ul style="list-style-type: none"> Annual art contest under energy themes 	<ul style="list-style-type: none"> 80 students from 18 schools joined the contest.
SGF Love Sharing Project	<ul style="list-style-type: none"> To promote school activities To extend educational opportunities to the youth in neighboring communities 	<ul style="list-style-type: none"> Provision of scholarships, financial supports to school activities, stationaries and sport equipment, targeting schools in one sub-district for each year. 	<ul style="list-style-type: none"> Students received stationaries and scholarships while schools won financial supports for their activities. Students enjoyed educational opportunities.
Career Promotion Project	<ul style="list-style-type: none"> To equip community members with knowledge and skills for sustainable income 	<ul style="list-style-type: none"> 2 short-term training courses in 2 communities 	<ul style="list-style-type: none"> Community members had knowledge and skills to earn extra income.
Youth Health Volunteers Project	<ul style="list-style-type: none"> To raise awareness in community health activities 	<ul style="list-style-type: none"> Annual training on the role and duty of health volunteers and desirable social-responsible projects for 50 young and older community members as well as community committee members. 	<ul style="list-style-type: none"> Young and older community members as well as community committee members gained more knowledge about public health operations and social responsibility.
Village health volunteer project	<ul style="list-style-type: none"> To improve villages' public health capabilities 	<ul style="list-style-type: none"> 3 training per annum to improve community capabilities on health operations 	<ul style="list-style-type: none"> Health volunteers were more capable in executing health operations.
Clean Canal Project	<ul style="list-style-type: none"> To engage stakeholders in tackling water-related issues 	<ul style="list-style-type: none"> Meeting with local administrative executives and leaders to know their issues and plan corrective measures Release of aquatic animals Distribution of seedlings Improvement of canal landscapes with cleaning and weed-eradication activities 	<ul style="list-style-type: none"> The water sources in target areas were clean and flow obstructions were removed.

Project/Activity	Objectives	Actions	Results (actual and expected)
Sahacogen (Chonburi) PCL. (continued)			
Disaster Relief Project (fire, flood, windstorm, disease outbreaks)	<ul style="list-style-type: none"> To demonstrate the company's social responsibility in light of disasters 	<ul style="list-style-type: none"> Cash donation to flood victims via PRINC Hospital's network Donation of necessity items to flood victims via Chonburi Social Development and Human Security Office 	<ul style="list-style-type: none"> Disasters-affected people received emergency aid.
Maintenance Volunteer Project	<ul style="list-style-type: none"> To support community infrastructure activities related to the company's operations To support engagement activities of Provincial Electricity Authority, Phitsanulok PEA office and neighboring communities 	<ul style="list-style-type: none"> Provision of maintenance supplies and staff for the electrical system maintenance at schools, temples and monasteries, organized once a year jointly with the network 	<ul style="list-style-type: none"> Schools and temples' electrical system was in safe conditions. Energy efficiency was enhanced, hence saving energy and expenses.
Community Tap Water Project	<ul style="list-style-type: none"> To support community utility-related activities To raise awareness in the significance of water and electricity resources, so as to lead to optimized utilization 	<ul style="list-style-type: none"> Provision of financial supports to electricity and tap water maintenance activities at 8 communities and 1 local administrative office in Khui Ban Ong Sub-district, Phran Kratai District, Kamphaengphet Province 	<ul style="list-style-type: none"> Village electrical and tap water systems were in safe conditions.
Nexif RATCH Energy Rayong Co., Ltd.			
COVID-19 protective equipment	<ul style="list-style-type: none"> To provide schools with COVID-19 protective equipment 	<ul style="list-style-type: none"> Extension of a fund for the protective equipment 	<ul style="list-style-type: none"> Students and teaching staff were better protected with the equipment to prevent and monitor disease spread in school.
Supports to life support bag preparation	<ul style="list-style-type: none"> To assist people affected by the COVID-19 impacts 	<ul style="list-style-type: none"> Provision of financial supports to the preparation of life support bags for distribution to people affected by the COVID-19 impacts 	<ul style="list-style-type: none"> The affected received assistance.
Supports to school library improvement	<ul style="list-style-type: none"> To improve educational resources 	<ul style="list-style-type: none"> Provision of financial supports to the improvement of Wat Ban Khai School's library 	<ul style="list-style-type: none"> Wat Ban Khai School's library was improved and could support students' learning activities.

Project/Activity	Objectives	Actions	Results (actual and expected)
Nexif RATCH Energy Rayong Co., Ltd. (continued)			
Supports to Nong Lalok Sub-district's education and sports foundation	<ul style="list-style-type: none"> To support community-level education development 	<ul style="list-style-type: none"> Provision of financial supports to assist the establishment of Nong Lalok Sub-district's education and sports foundation 	<ul style="list-style-type: none"> Nong Lalok Sub-district had funds to support the education and sports foundation.
Supports to home repair activities	<ul style="list-style-type: none"> To provide the poor with better accommodations 	<ul style="list-style-type: none"> Provision of financial supports to assist the maintenance of the poor's accommodations 	<ul style="list-style-type: none"> Poor people were delivered safe and better-conditioned accommodations.
Supports to Rayong's energy saving campaign	<ul style="list-style-type: none"> To campaign for energy saving in Rayong Province 	<ul style="list-style-type: none"> Provision of financial supports to Rayong's energy saving activities 	<ul style="list-style-type: none"> The general public changed their behaviors to save energy.
RATCH-Lao Services Co., Ltd.			
RATCH Ruam Pattana School Building	<ul style="list-style-type: none"> To build a learning center 	<ul style="list-style-type: none"> Construction of a school building for kindergarten students, toilets and a garden along with electrical system for Ban Phu Luang School Monitoring of students' academic performance 	<ul style="list-style-type: none"> Ban Phu Luang School could better serve students. The better building and environment could better motivated students' learning enthusiasm.
Youth development activity	<ul style="list-style-type: none"> To equip the youth in remote areas with career skills 	<ul style="list-style-type: none"> Participation in career skill training 	<ul style="list-style-type: none"> Workers received skill training concerning sewing, cooking, hotel management, beauty salon, car maintenance and construction. The community's employment rate increased.
Annual medical examination	<ul style="list-style-type: none"> To provide company staff and neighboring community members with medical examination 	<ul style="list-style-type: none"> Provision of annual medical examination to company staff and the villagers of 15 villages in Lamam City, 10 villages in Sekong Province and 5 villages in Kaluem district. 	<ul style="list-style-type: none"> Company staff and villagers near the operating area enjoyed greater accessibility to basic health services. Villagers received treatment and annual health check-up.

Corporate Benefits

The operations with responsibility for community and society not only reflect RATCH's determination to return benefits to community and society, but also contribute positive results to the organization. In qualitative term, the peaceful coexistence of community and power plants is apparent and the power plants



have received no complaint. In quantitative term, RATCH expects an increase in carbon credits from forest conservation activities like the reforestation project in Chanthaburi Province (113.47 rai) in collaboration with the Department of Marine and Coastal Resources and the reforestation project in Chanthaburi Province (500 rai) in collaboration with the Department of Royal Forest's Reforestation Promotion Office. Both projects will help offset the company's emissions and/or reduce possible future carbon taxes. Both projects are in the development process and the project design document (PDD) is being prepared. The amount of sequestered carbon will be calculated thereafter.

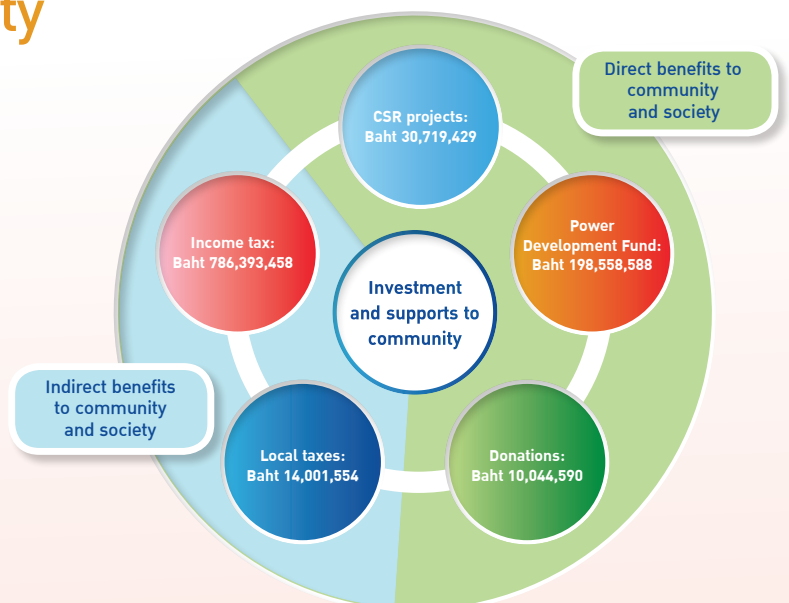
Survey of Public Opinion

Ratchaburi Power Plant conducts a public opinion survey every 2 years. The survey result in 2021 was extraordinary (with the score of 91.16%). In 2022, the power plant received no complaint from neighboring community.

Other operational controlled power plants of RATCH surveyed public opinions through their tri-partite committees, which are represented by community members and other stakeholder groups. The committees monitor the power plants' operations and reflect the public opinions on problematic issues and concerns relating to the operations. In 2022, all of them received no complaint, showing that their operations remained acceptable to community.

Investment and Support to Community and Society

RATCH Group maintains its determination and emphasis in supporting community and social activities that will strengthen all parties from the community level to the national level. The supports are either direct contributions to activities and projects or indirect financial supports that involve contributions to social projects, donations and tax payments.



Economic Performance



RATCH steered the business in 2022 with “Strength”, “Synergy” and “Sustainability” strategies for the sustainability of economic growth and shared values for stakeholders, community, society and the environment.

Performance of Strategy 1: Strength

Operational efficiency in focus, for worthwhile returns and organizational excellence. The performance is summarized below:

Distribution of economic values in 2022

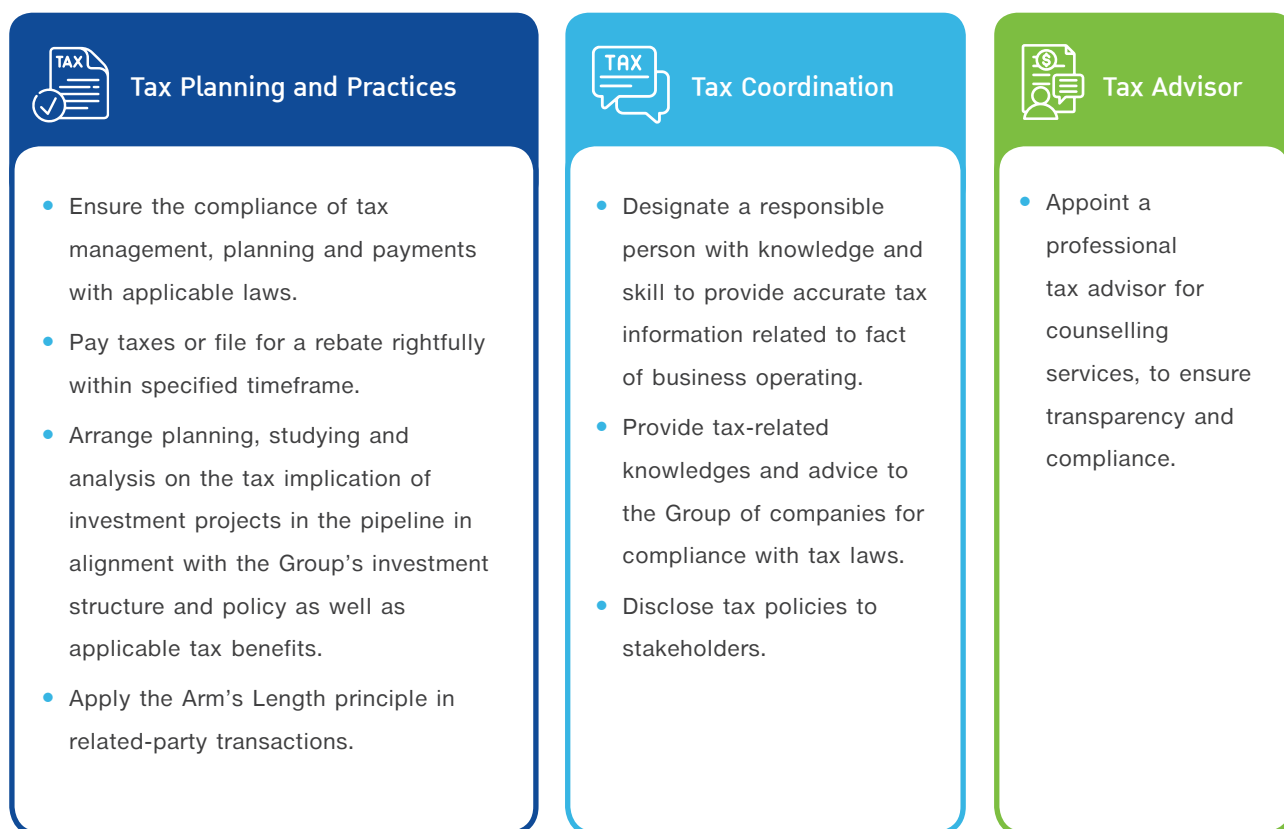
Item	Value (Million Baht)
Economic value generated	
Revenue from sales/service and leases contracts	74,725.22
Profit sharing from associates and joint ventures	5,391.16
Dividend income	26.51
Other revenues	1,645.19
Economic value distributed to stakeholders	
Fuel expenses	61,413.37
Operation and maintenance service expenses	2,040.37
Cost of maintenance and parts	1,307.80
Power plant insurance premium	592.23
Administrative expenses and payments	941.28
Financial cost/interest expenses	2,976.67
Tax payments*	786.39
Fees for specialized services	769.54
Audit fee	2.40
Local tax payments**	14.00
Dividend payments	3,697.50
Community and social investment	239.32
Economic value received by RATCH	
RATCH's profits	5,782.07

* Inclusive of corporate tax, withholding tax, and special business tax of RATCH and subsidiaries in Thailand

** Local taxes are the taxes collected by local administrative offices to finance local development projects. Local taxes are subjected to local administrative offices' consideration and are not remitted to the government. They are land and building tax, local development tax, and signboard tax.

Tax management

As a holding company with interests in a diverse range of business entities in Thailand and overseas, RATCH recognizes the importance of tax management and implements the tax management plan prudently, transparently and in line with international standards, governance practices and business conduct. The following tax policies are formulated as the operational framework across the Group:



Group's tax management performance in 2022




1. RATCH Group completely followed the official tax payment and rebate timeframe. In 2022, the Group's income tax, value added tax and special business tax amounted to Baht 786.39 million.
2. The Group studied and analyzed the tax implications of planned investment projects in alignment and compliance with related tax laws, so as to support the investment decision making process and correctly tap available tax privileges.
3. The Group applied the Arm's Length principle for transactions between the Group's business entities.
4. The subsidiaries in Thailand with Investment Promotion Certificates were entitled to corporate tax exemption and/or reduction per the terms and conditions specified in the certificates.

*Remark: The Group encompasses business entities owned more than 50% by RATCH.

Financial information in 2022

Item	2022	2021	2020
Income statement			
Total revenue (Million Baht)	81,788.08	44,342.65	39,521.99
Earnings before interest, tax, depreciation, and amortization (EBITDA) (Million Baht)	12,811.71	11,710.97	9,664.80
RATCH's net profits (Million Baht)	5,782.07	7,818.80	6,286.68
Financial statement			
Assets (Million Baht)	229,578.28	157,015.46	112,132.25
Liabilities (Million Baht)	122,175.01	77,737.52	51,610.68
Shareholders' equity (Million Baht)	107,403.27	79,277.94	60,521.57
Shares or common share information			
No. of issued and paid-up shares (shares)	2,174,999,985	1,450,000,000	1,450,000,000
Paid-up capital (Million Baht)	21,750	14,500	14,500
Book value (Baht)	45.07	48.51	41.74
Earnings per share (Baht)	3.15	5.39	4.34
Dividend per share (Baht)	1.60	2.50	2.40
Dividend payout ratio (%)	60.19	46.36	55.36
Financial ratios			
Current ratio (times)	1.90	1.25	2.69
Return on asset (%)	5.03	7.07	7.24
Return on equity ratio (%)	6.90	11.63	9.98
Profit margin (%)	20.91	40.43	31.03

Credit ratings

	TRIS Ratings	Moody's	S&P Ratings
	AA+	Baa1	BBB-
	Outlook: Stable	Outlook: Stable	Outlook: Stable

Revenue structure

RATCH reaped **Baht 81,788.08 million** in revenue in 2022.

Revenue is classified as follows:

Type of revenue	Amount (Million Baht)	% of total revenue	Revenue of companies in reporting scope (Million Baht)	% of total revenue
1. Revenue from sales/service and leases contracts	74,725.22	91.37	74,725.22	97.81
2. Profit sharing from associates and joint ventures	5,391.16	6.59	283.81	0.37
3. Dividend income from subsidiaries and RATCH's investments	26.51	0.03	15.89	0.02
4. Other income – interest income, management fees and others	1,645.19	2.01	1,372.59	1.80

Performance of Strategy 2: Synergy

Integrated collaboration with leading partners in Thailand and abroad for sustainable growth in potential power and non-power businesses in the value chain as well as emphasis on innovation for further business expansion and value added. The performance in 2022 is summarized below:

Investment in power generation businesses

Project	Details	Investment (Million Baht)	Partner
Hin Kong Power Plant, Ratchaburi Province	<ul style="list-style-type: none"> RATCH holds a 51% stake in Hin Kong Power Co., Ltd. A gas-fired combined cycle power plant with 2 generators and installed capacity of 1,540 MW Under construction and scheduled for commercial operation in 2024 and 2025 	463.59	<ul style="list-style-type: none"> Gulf Energy Development Public Co., Ltd.
REN Korat Power Plant	<ul style="list-style-type: none"> RATCH holds a 40% stake in REN Korat Energy Co., Ltd. that develops an Independent Power Supply (IPS) project with 31.20 MW installed capacity. Under construction and scheduled for commercial operation in 2024 	120	<ul style="list-style-type: none"> Nava Nakorn Public Co., Ltd. PEA ENCOM International Co., Ltd.

Project	Details	Investment (Million Baht)	Partner
Sekong 4 and Sekong 5 Hydropower Project	<ul style="list-style-type: none"> RATCH holds a 60% stake in Sekong Investment Advisory Co., Ltd. (SIA) that develops 355-MW projects in Sekong Province, Lao PDR 	1.44	<ul style="list-style-type: none"> B.Grimm Power Public Co., Ltd. Local partner in Lao PDR
<ul style="list-style-type: none"> Sahacogen Power Plant Sahacogen Green Biomass Power Plant in Lamphun Province Biomass power plant by Sahagreen Forest Project, Kamphaengphet Province 	<ul style="list-style-type: none"> RATCH purchased 7.80 million issued and paid-up stock or 0.67% of the total of Sahacogen (Chonburi) Public Co., Ltd., from the offerings of another shareholders, resulting in RATCH's shareholding in Shacogen increasing to 51.36%. Shacogen operates gas-fired Power Plant's maximum capacity is 214 MW of electricity and 96 tons/hour of steam. It also has interest in; <ol style="list-style-type: none"> 9.6-MW Sahacogen Green Biomass Power Plant Lamphun is located in Saha Group Industrial Park Lamphun. Sahagreen Forest Project Kamphaengphet has 7.5 MW capacity. Solar rooftop installation service and distribution of 53 MW electricity by Impact Solar Co., Ltd. (21% owned) 	44.83	<ul style="list-style-type: none"> Saha Group
RATCH Cogeneration Power Plant	<ul style="list-style-type: none"> RATCH acquired 0.03% shares of RATCH Cogeneration Co., Ltd. from existing shareholders, boosting its holding from 99.97% to 100%. 	0.55	<ul style="list-style-type: none"> Existing shareholders
24 power plants	<ul style="list-style-type: none"> RH International (Singapore) Corporation Pte. Ltd. (RHIS), an indirect subsidiary, acquired all shares of Nexif Energy Holdings B.V. and NXF Holdings 2 Ltd. which own 24 renewable, gas turbine and combined cycle power plants and battery storage project, commercially-operational and under development/construction. 	16,616.75	<ul style="list-style-type: none"> Nexif Energy Group
Sibundong Hydroelectric Power Plant	<ul style="list-style-type: none"> Fareast Renewable Development Pte. Ltd. (FRD), a 90%-owned subsidiary in Singapore, acquired a 55.56% stake in PT Tapanuli Hydro Energy. The water runoff power plant is located on Sibundong River, North Sumatra, Indonesia. Having 73.70 MW capacity, it is scheduled for operation in 2028. 	577.29	<ul style="list-style-type: none"> Eco Energy Holdings Pte. Ltd.

Project	Details	Investment (Million Baht)	Partner
Nexif RATCH Energy Investment Co., Ltd.	<ul style="list-style-type: none"> RH International (Singapore) Corporation Pte. Ltd. (RHIS), a subsidiary in Singapore, acquired a 49% stake. To complete renewable energy projects - involving hydropower, wind power, solar power and battery storage To explore new projects and high-potential investment opportunities in response to low-carbon society 	4,696.39	<ul style="list-style-type: none"> Nexif Energy Group

Investment in non-power business

Company/ Project	Details	Investment (Million Baht)	Partner
Principal Healthcare – Sakhon Nakhon Co., Ltd.	<ul style="list-style-type: none"> RATCH bought a 25% stake for investment in a private hospital namely Princ Sakon Nakhon Hospital. The tertiary hospital in Sakhon Nakhon Province has 59 beds. Scheduled for opening in February 2023 	75	<ul style="list-style-type: none"> Principal Healthcare Co., Ltd., a subsidiary of Principal Capital Public Co., Ltd.

Investment on innovation

RATCH has invested in a 30% stake in Innopower Co., Ltd, which is owned 40% by the Electricity Generating Authority of Thailand and 30% by Electricity Generating Public Company Limited. It is positioned to play a key role in driving investment in energy and sustainability innovations under the following patterns:

1. Venture Capital: Emphasizing investment in technology and energy/sustainability innovations in Thailand and abroad to take part in mitigating climate change impacts. The goal is to further grow clean energy, make energy innovations a part of everyday life and create positive impacts in driving Thailand towards net zero society.

2. Venture Builder: Exploring global energy innovations and importing the innovations that will be new alternatives in the energy industry and promote energy efficiency as well as release least emissions on the individual level. Innopower’s contribution involves knowledge and expertise in the energy business and innovations as well as tools and resources, to materialize startup business ideas.
3. Strategic Partnership: Giving importance to introduce new green energy innovations and technology to Thai society through collaboration. Innovation sets the plan to jointly invest in 1) Future Mobility 2) Future of Energy Network and 3) ESG-related businesses, in support of Thailand’s carbon neutrality target.

Investment in 2022

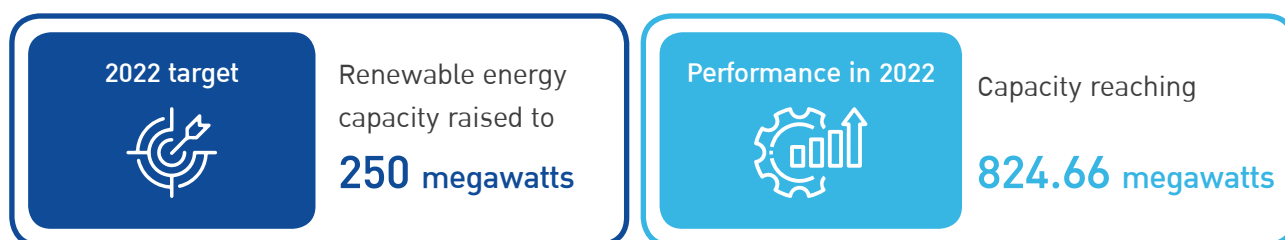
Business Segment	Performance	Investment (Million Baht)
1. Venture Capital	<ul style="list-style-type: none"> • Investing in a startup for the development of Net Zero Emission innovation • Investing in a mutual fund focusing on startups for the development of Net Zero Emission innovation 	460
2. Venture Builder	<ul style="list-style-type: none"> • Developing an incubation program for EV charger distributors, to pave way for the establishment of an EV flagship company • Developing a digital EV Charger platform 	
3. Strategic Partnership	<ul style="list-style-type: none"> • Investing in E-Bus Services to provide a 3-year shuttle service with 37 minibuses for EGAT job operators and their children at Mae Moh District, Lampang Province • Solar power system installation project • Solar Plus Project: to offer households solar rooftop installation in collaboration with EGAT, Kasikornthai Bank, PEA ENCOM Smart Solution Co., Ltd. and Supalai Public Co., Ltd., • Cooperation with Super Carbon X Co., Ltd. to develop the trading platform for renewable energy certificate (REC) and carbon credits, in support of low-carbon society and carbon neutrality target 	

Research on health innovations

RATCH also pays attention to health innovations and has conducted research on healthtech, particularly on drugs and vaccines, and the development of high-tech medical equipment for more efficient and successful results of treatment.

Performance of Strategy 3: Sustainability

Supporting renewable energy. The performance in 2022 is as follows:



Performance in 2022

Project	Location	Installed capacity	Shareholding (%)	Equity installed capacity	Status
Lincoln Gap 1&2 Wind Farm	Australia	212.00	100.00	212.00	Operating
Coc San Hydro Power Project	Vietnam	29.70	58.48	17.37	Operating
Song Giang 2 Hydro Power Project	Vietnam	37.00	46.22	17.10	Operating
Song Giang 1 Hydro Power Project	Vietnam	12.00	46.22	5.55	Under construction
Calabanga solar farm	Philippines	74.10	29.42	21.80	Under development
Sekong 4A & 4B Hydropower Project	Lao PDR	355.00	60.00	213.00	Under development
Sibundong Hydroelectric Power Plant	Indonesia	73.70	50.00	36.85	Under development
Nexif Ben Tre wind farm	Vietnam	80.00	74.50	59.60	Under development

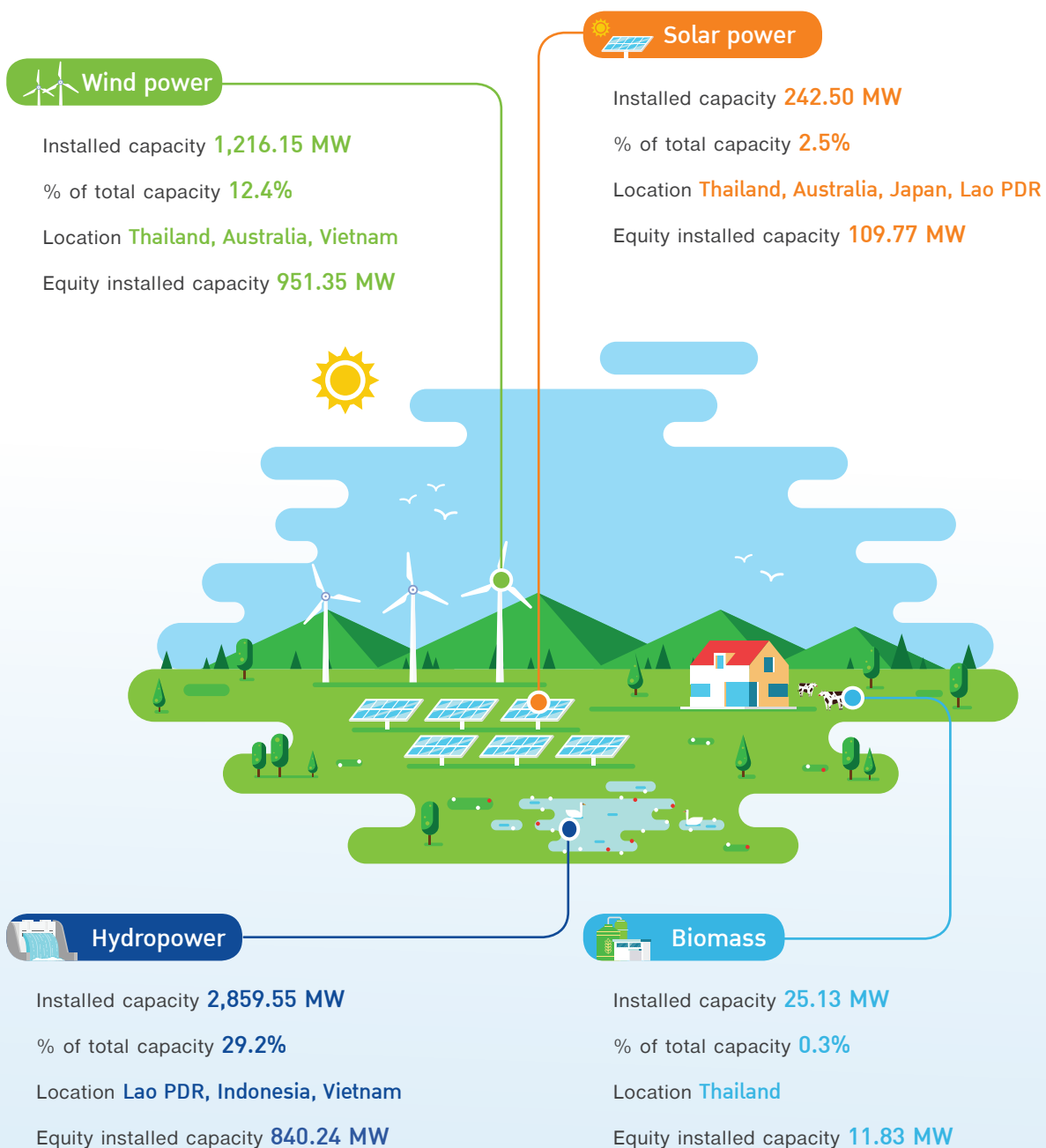
Investment in renewable energy: Baht
23,616.48 million
or **93%** of total investment in 2022



Renewable energy capacity:
1,913 MW
or **20%** of total capacity



Capacity sorted by energy sources in 2022



Supply Chain Management



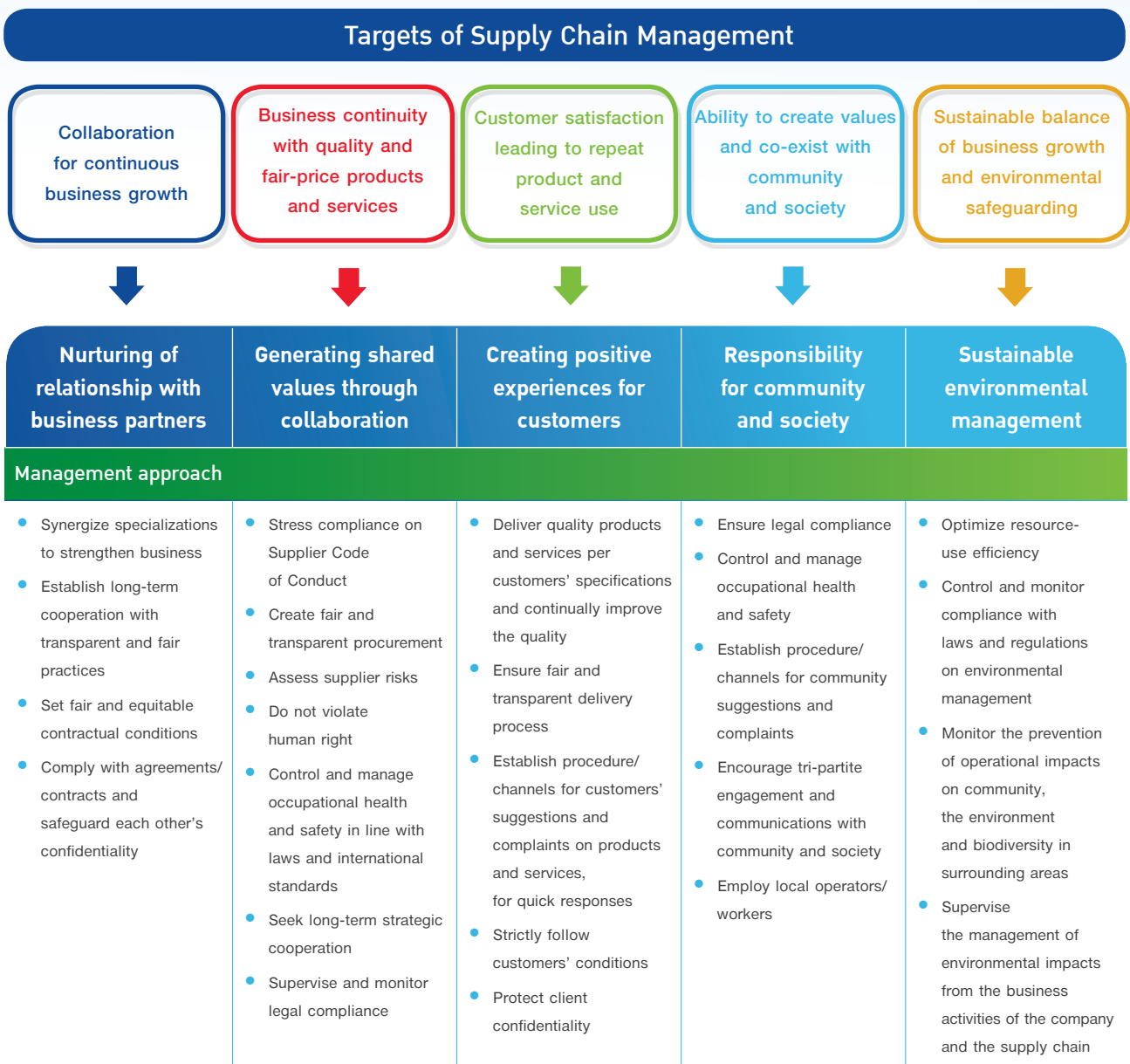
RATCH operates in various businesses from electricity generation and infrastructure to services that involve a diverse range of stakeholders. Paying attention to the management of all stakeholders throughout the business supply chain is thus a crucial factor for business success and sustainable growth.

The company is aware of the importance of supply chain management and gives it importance. The guidance on treatments of stakeholders are enshrined in the Code of Conduct that encompasses shareholders, employees, creditors, business partners, suppliers or vendors, competitors, the government sector, community, society and the environment.

The supply chain involves with 4 main business stages: 1) Project development 2) Construction 3) Production and service and 4) closing a business. Success factors are business partners, suppliers, customers, community and the environment. The management approach for these stakeholders is set as follows:



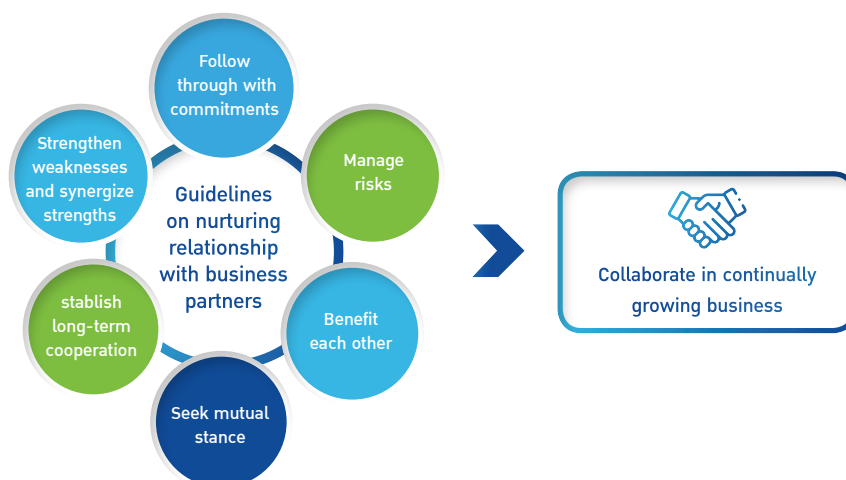
[More details](#)



Nurturing of relationship with business partners	Generating shared values through collaboration	Creating positive experiences for customers	Responsibility for community and society	Sustainable environmental management
Management/Action				
<ul style="list-style-type: none"> • Set expectation criteria and clear designation of duty, responsibility and decision-making authority • Prepare written agreements • Align financial management with investment plans • Clearly set the procurement criteria, condition and method • Set executive-level discussion to formulate mutual solutions for all parties • Set a clear exit plan from joint investment, if necessary 	<ul style="list-style-type: none"> • Adopt an appropriate and standard assessment/selection criteria as well as contract formats • Ensure an appropriate and fair selection process, enabling fair and equitable competition • Set up a system to monitor compliance with contracts to prevent fraud and corruption at all stages • Improve and nurture sustainable relationship with quality suppliers • Prohibit executives/ employees from soliciting or making dishonest payments when dealing with suppliers • Promptly notify suppliers in advance if unable to meet conditions, to jointly find a solution • Prepare agreements or contracts for suppliers in line with the company's standards and set penalties 	<ul style="list-style-type: none"> • Provide product and service warranty with an appropriate warranty period • Promptly notify customers in advance if unable to meet conditions, to jointly find a solution • Do not solicit or receive any dishonest benefits when dealing with customers • Disclose complete, accurate and non-misleading information/news on products and services • Protect client confidentiality and do not share the information for own benefits or related individuals' • Discuss production plans and customers' specifications on a regular basis • Survey customer satisfaction and make improvement plans based on their suggestions 	<ul style="list-style-type: none"> • Communicate with community and seek understanding in the company's operations • Establish a communication channel to welcome complaints/ recommendations from community and set clear problem-solving guidelines • Control impacts on the community environment and safety, from activities of the company's suppliers and business partners • Give priority to recruit local job operators/ workers 	<ul style="list-style-type: none"> • Select environmental-friendly production technology • Establish an appropriate environmental quality control and monitoring system • Consider the application of 3Rs principles in the production process and office activities • Hold discussion meetings to regularly monitor environmental management results

Nurturing of relationship with business partners

Seeking strategic partners is in line with S2-Synergy strategy in order to drive the company's business expansion and branching out to new markets for sustainable and mutual growth of both parties.



Generating values through collaboration

In the quest to become a leading energy and infrastructure company, suppliers play a key role in supporting and driving the company towards its goals; for example, in providing products and services for the company's operations in accordance to business plans and targets. Nevertheless, suppliers can create negative impacts on the operations through, for instance, violation of human rights, delivery of substandard services, impacts on the environment and greenhouse gas emissions. RATCH has to deal with a large number of suppliers for its electricity generation, infrastructure and related businesses. Awareness and emphasis on creating shared values with suppliers is essential in maintaining business continuity in a sustainable manner.



Overview of importance of suppliers and supplier management approach

Suppliers in the supply chain

Significant suppliers in the supply chain that involves energy, infrastructure and related businesses are:

Suppliers	Project development	Project construction	Commercial operations	Decommissioning/dissolution
• Technical and investment advisory service providers	✓	-	-	-
• Environmental, social and health impact assessment service providers	✓	-	-	-
• Legal and technical advisory service providers	✓	✓	✓	✓
• Insurance companies	✓	✓	✓	✓
• EPC contractors	-	✓	-	✓
• Providers of annual operation and maintenance services	-	-	✓	-
• Technology, machinery and equipment producers and suppliers	-	✓	✓	-
• Fuel and resource suppliers	-	-	✓	-
• Waste processors	-	✓	✓	✓
• Onsite facilitators (security/cleaning services)	-	-	✓	-

Management approach as shown in Supplier Code of Conduct

Realizing the importance of suppliers to success and sustainable business operations, RATCH has established the Supplier Code of Conduct that is aligned with the company's Code of Conduct, legislation and relevant international standards such as the United Nations Global Compact and the International Labor Organization's Declaration on Fundamental Principles and Rights at Work. Suppliers are required to follow the best practices and hold their suppliers responsible for the practices as well.

Supplier Code of Conduct	
1. Business ethics	<ul style="list-style-type: none"> 1.1 Legal compliance 1.2 Responsible operations 1.3 Fight against all forms of fraud, corruption and bribe giving/taking 1.4 Giving of gifts, souvenirs and receptions 1.5 Anti-competition practices 1.6 Disclosure of information as deemed necessary 1.7 Protection of intellectual property 1.8 Protection of confidential information and personal data
2. Treatment of labor and Respect for human rights	<ul style="list-style-type: none"> 2.1 Respect for human rights 2.2 Respect for labor rights and human dignity 2.3 Prohibition and avoidance of child labor 2.4 Equal and non-discriminatory treatment for local and migrant workers 2.5 Treatment of female workers 2.6 Right to pursue freely chosen employment 2.7 Pay and benefits
3. Working conditions	<ul style="list-style-type: none"> 3.1 Working period 3.2 Termination of employment or contract
4. Safety, occupational health and work environment	<ul style="list-style-type: none"> 4.1 Safe work environment 4.2 Security management 4.3 Preparation for emergency
5. Environmental management	<ul style="list-style-type: none"> 5.1 Compliance with legal environmental requirements 5.2 Management of environmental impacts 5.3 Resource utilization, control of pollutants and waste management 5.4 Management of hazardous materials and product safety
6. Social responsibility	<ul style="list-style-type: none"> 6.1 Prevention of impacts on community and society 6.2 Management of partners in suppliers' supply chain
7. Implementation of Code of Conduct	<ul style="list-style-type: none"> 7.1 Management system 7.2 Grievance and complaint procedure 7.3 Investigation and problem-solving procedure 7.4 Continuous improvement

Source: RATCH Group Public Company Limited's Announcement # 6/2022 On Supplier Code of Conduct



[More details](#)

Classification and grouping of key suppliers

Classification and grouping criteria

Suppliers are grouped accordingly to these 2 factors:

- 1) Difficulty/complication or supply risk: for example, when the product or service is monopolized by a single supplier, imposes strict conditions on access or demands advanced technology innovation.
- 2) Suppliers' significance to the company's revenue or profits

RATCH needs to set a strategy to manage relationship with suppliers, to maintain its economic values and prevent risks possibly caused by involved suppliers. Suppliers are put into 4 groups as follows:

Group 1 : Non-Critical Supplier (Low Supply Risk–Low Profit Impact)

Suppliers of standard, easy-to-find and low-value products/services that contain no procurement risk or high impact on production. Suppliers in this group are high in number.

Group 2 : Leverage (Low Supply Risk–High Profit Impact)

Suppliers of high-standard, easy-to-find but high-value products/services that are related to production cost. A change in their prices will directly affect product costs.

Group 3 : Bottleneck (High Supply Risk–Low Profit Impact)

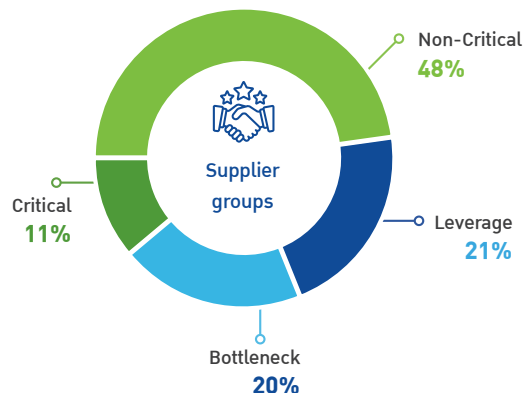
Suppliers of products/services with specialized and hard-to-find characteristics. This group contains high supply risk due to a limited number of suppliers and the company's bargaining power is limited. The cost of products/services may rise and delivery may take time or quality may be compromised. The company needs an efficient procurement plan, to avoid impacts on the operations

Group 4 : Critical (High Supply Risk–High Profit Impact)

Suppliers low in number or probably the only in the market (Monopoly). Their products/services are highly special (with variable specifications) and high value. Aside from impacts on production cost, the Company cannot switch suppliers at will due to the monopoly and associated costs. This group poses high risks and high impacts in case of shortage and the Company's bargaining power is limited.

Suppliers critical to operations

The classification of suppliers involves only Tier-1 suppliers or those directly supplying products or services for the company.



Supplier groups	Number of suppliers							Total
	RATCH	RGCO	RAC	RLS	RCO	NNEG	BPC	
1) Non-critical	245	109	27	15	15	29	66	506
2) Leverage	34	81	35	8	18	28	21	225
3) Bottleneck	28	8	116	0	12	20	28	212
4) Critical	15	4	55	0	4	15	17	110

RATCH = RATCH Group PCL
 RGCO = Ratchaburi Electricity Generating Co., Ltd.
 RAC = RATCH-Australia Corporation Pty.
 RCO = RATCH Cogeneration Co., Ltd.
 NNEG = Nava Nakorn Electricity Generating Co., Ltd.
 RLS = RATCH-Lao Services Co., Ltd.
 BPC = Berkprai Cogeneration Co., Ltd.

Assessment of supplier risks and preparation of risk prevention and impact management measures

3.1 Assessment of critical suppliers' risks

The risks of suppliers in critical group are categorized accordingly to 2 main assessment criteria: supply risk and ESG risk (environmental, social and governance). The 4 risk levels are Very Low, Low, Medium and High.



Supply Risk

- Capability to impact operation/production
- Replaceability

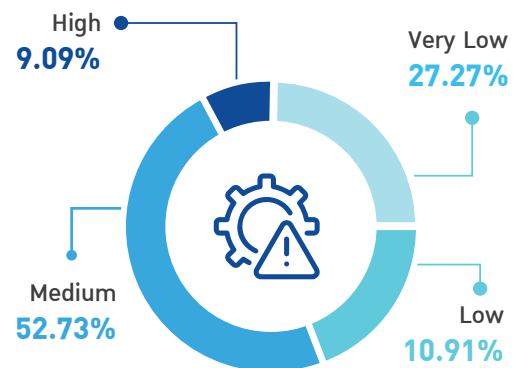


ESG Risk

- **Environmental management:** Possibility of impacts on the company from incompliance with laws, GHG emissions, complaints, reputation, etc.
- **Safety and occupational health management:** Possibility of impacts on the company from incompliance with laws, accidents, work-related illness, complaint, reputation, etc.
- **Governance issues:** Existence of anti-corruption policy/commitment

Supplier risk assessment (Critical Group)

Supplier risk level (Procurement)	Risk level				Total
	Very Low Risk	Low Risk	Medium Risk	High Risk	
Number of suppliers	10	58	12	30	110
% of suppliers	27.27	10.91	52.73	9.09	100.00



Supplier risk management approach

RATCH has established Supplier Code of Conduct detailing best practices all suppliers must follow, to manage possible risks. The characteristics of suppliers' own operational risks are also analyzed and the following preventive measures are drawn up to reduce the likelihood.

Issue	Supplier risk	Preventive measures	Performance in 2022
Governance	Suppliers' financial status and stability	<ul style="list-style-type: none"> Require collateral/bank guarantee Probe financial track record dating back 2 years Examine job abandonment and blacklisting history 	<ul style="list-style-type: none"> All suppliers complied with the company's collateral/ bank guarantee requirement None of them had no job abandonment record
	Sub-contractor management	<ul style="list-style-type: none"> Evaluate job risks Set ESG conditions on sub-contractors in the main contract with main contractors Probe their compliance with safety measures 	4 sub-contractors were procured and complied with all the company's requirements.
Fair practices	Price collusion and conflict of interest	<ul style="list-style-type: none"> Include this clause in supplier qualification assessment criteria Inquire suppliers' history from previous hirers Examine the company certificate Put them in supplier blacklist if finding irregularities 	No suppliers misconducted on price collusion and conflict of interest.
	Abandonment/delivery failure/substandard products or services	<ul style="list-style-type: none"> Set penalties Confiscate guarantee Cancel contract File lawsuits Put them in supplier blacklist if they fail to honor contracts 	No job abandonment and quality products or service delivery on time as agreed.
	Suppliers with contract worth more than Baht 10 million who fail to honor contracts	<ul style="list-style-type: none"> Require collateral placement Inspect compliance with contract and delivery Set a condition to make payment in instalments, based on work progress Make a company visit 	Suppliers with over 10 million baht contract complied with all conditions
Human rights	Human rights violations (Employment of child and illegal labor/ Discrimination/ Treatment of the vulnerable)	<ul style="list-style-type: none"> Include this clause in supplier qualification assessment criteria Make a company visit Require reporting on on-duty workers' information Require registration documents for migrant workers Put them in blacklist in case of violations 	No complaint on human rights violation
Treatment of labor	Employment/wage payment/work conditions	<ul style="list-style-type: none"> Make the issue part of the supplier qualification assessment criteria Inquire information from previous hirers Make a company visit Put them in supplier blacklist if finding irregularities 	No complaint about employment, pay, compensation and work conditions

Issue	Supplier risk	Preventive measures	Performance in 2022
Treatment of labor (Continue)	Occupational health and safety	<ul style="list-style-type: none"> • Demand job orientation and risk assessment at all assignments • State the provision of specified safety equipment in contracts • Require contractors to provide insurance to operators for high-risk jobs 	<ul style="list-style-type: none"> • Job risk assessment was conducted as required • Fatal accident on sub-contractor's employee was properly conducted remedy and investigated cause of the incident and sought out corrective and repetitive prevention measures.
Environment	Suppliers' environmental and waste management	<ul style="list-style-type: none"> • Make the issue part of the supplier qualification assessment criteria • Make it part of the contracts and monitor compliance • Make a company visit 	<ul style="list-style-type: none"> • Including environmental management conditions in the contract with all environmental risk suppliers • 12 suppliers were certified environmental standard / or compliance with requirements of EIA and ISO 14001.
Consumers	Delivery of quality goods and services/sustainable consumption	<ul style="list-style-type: none"> • Specify this condition in contracts and monitor compliance • Make a company visit 	All suppliers met the company's criteria.
	Protection of consumer information and information privacy	<ul style="list-style-type: none"> • Inquire information from previous hirers • Examine the company certificate • Specify this condition in contracts and monitor compliance • Set penalties • Abolish contracts • File lawsuits 	No information privacy of consumers and the company's suppliers breached.
Engagement and community development	Socially-responsible operations without causing impacts on community	<ul style="list-style-type: none"> • Include this clause in supplier qualification assessment criteria • Specify this condition in contracts and monitor compliance • Make a company visit 	No compliant about supplier's activities from community

Procurement management in 2022

Supplier selection

Supplier qualification assessment criteria

In selecting goods and services suppliers, RATCH will consider the list of suppliers whose qualifications meet the clauses in the Supplier Code of Conduct. The qualification assessment criteria has been in place, to select desirable suppliers.

Supplier qualification assessment criteria

Governance dimension	Integrity/transparency/responsibility	<ul style="list-style-type: none"> No record of all forms of corruption No record of abandonment
	Conflict of interest	<ul style="list-style-type: none"> Executive/Director hold no position in a competing bidder No personal relationship with the company's executives/employees
Environmental dimension	Environmental management and accountability	<ul style="list-style-type: none"> Certification on environmental standards (ISO 14000) or compliance with environmental regulations (EIA)
		<ul style="list-style-type: none"> Compliance with environmental law/regulations and environmental impact management process
Social dimension	Labor, community and social stewardship	<ul style="list-style-type: none"> Zero employment of child or illegal labor
		<ul style="list-style-type: none"> Respect for the human rights of employees/workers and no infringement to basic human rights
		<ul style="list-style-type: none"> Socially-responsible operations without causing impacts on nearby community

Supplier Qualification Assessment in 2022

RATCH assessed the qualifications of 1,362 suppliers in accordance with the assessment criteria. Of total, 973 were existing suppliers and 389 were new suppliers. All met the qualification criteria, enabling complete delivery and zero abandonment. The assessment results were sent to suppliers along with recommendations for further improvement.

Company	Type of supplier (Number)		
	Existing supplier	New supplier	Total
RATCH Group PCL (HO)	72	37	109
Ratchaburi Electricity Generating Co., Ltd.	121	64	185
Ratch Cogeneration Co., Ltd.	65	111	176
Berkprai Cogeneration Co., Ltd.	61	70	131
Sahacogen (Chonburi) PCL.	137	8	145
Nava Nakorn Electricity Generating Co., Ltd.	185	56	241
RATCH – Australia Corporation Pty Ltd	332	43	375
Total	973	389	1,362

Elements of supplier qualification assessment criteria	RATCH Group PCL (Head Office)				RATCH Cogeneration Co., Ltd.				Berkprai Cogeneration Co., Ltd.				Sahacogen (Chonburi) PCL				Nava Nakhon Electricity Generating Co., Ltd.			
	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%
Governance dimension																				
1.1. Integrity/transparency/responsibility																				
• No record of all forms of corruption	72	37	109	100	65	111	176	100	61	70	131	100	137	8	145	100	185	56	241	100
	72	37	109	100	65	111	176	100	61	70	131	100	137	8	145	100	185	56	241	100
• No record of abandonment	72	37	109	100	65	111	176	100	61	70	131	100	137	8	145	100	185	56	241	100
	72	37	109	100	65	111	176	100	61	70	131	100	137	8	145	100	185	56	241	100
2. Conflict of interest																				
• Executive/Director hold no position in a competing bidder	72	37	109	100	65	111	176	100	61	70	131	100	N/A	N/A	N/A	N/A	185	56	241	100
	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	185	56	241	100
• No personal relationship with the Company's executives/employees	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	185	56	241	100
	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	185	56	241	100
Environmental dimension																				
3. Environmental management and accountability																				
• Certification on environmental standards (ISO 14000) or compliance with environmental regulations (EIA)	8	2	10	100	10	10	20	100	N/A	N/A	N/A	N/A	1	1	2	100	185	56	241	100
	8	2	10	100	10	10	20	100	N/A	N/A	N/A	N/A	1	1	2	100	185	56	241	100

Elements of supplier qualification assessment criteria	RATCH Group PCL (Head Office)				RATCH Cogeneration Co., Ltd.				Berkprai Cogeneration Co., Ltd.				Sahacogen (Chonburi) PCL				Nava Nakhon Electricity Generating Co., Ltd.			
	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%	Existing suppliers (No.)	Newly-listed suppliers (No.)	Qualified suppliers (No.)	%
<ul style="list-style-type: none"> Compliance with environmental law/regulations and environmental impact management process 	8	2	10	100	10	10	20	100	N/A	N/A	N/A	N/A	1	1	2	100	185	56	241	100
Social dimension																				
4. Labor, community and social stewardship																				
<ul style="list-style-type: none"> Zero employment of child or illegal labor 	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	137	8	145	100	185	56	241	100
<ul style="list-style-type: none"> Respect for the human rights of employees/workers and no infringement to basic human rights 	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	137	8	145	100	185	56	241	100
<ul style="list-style-type: none"> Socially-responsible operations without causing impacts on nearby community 	72	37	109	100	65	111	176	100	N/A	N/A	N/A	N/A	137	8	145	100	185	56	241	100

Product and Service Procurement in 2022

Item	Purchaser						
	RATCH Group PCL.	Ratchaburi Electricity Generating Co., Ltd.	RATCH Cogeneration Co., Ltd.	Berkprai Cogeneration Co., Ltd.	Sahacogen (Chonburi) PCL	Nava Nakhon Electricity Generating Co., Ltd.	RATCH – Australia Corporation Pty Ltd
No. of transactions	195	810	313	242	679	581	N/A
• Price negotiation method	124	687	282	96	0	424	N/A
• Price inquiry method	12	18	9	17	678	76	N/A
• Competitive bidding method	N/A	3	1	0	1	4	N/A
• Special procurement method	59	102	21	129	0	77	N/A
Value (Million Baht)	84.73	303.39	88.21	46.03	1,321.88	841.47	N/A
• Price negotiation method	4.74	66.44	19.55	2.74	0	13.98	N/A
• Price inquiry method	13.70	25.94	9.00	10.60	1,237.18	51.06	N/A
• Competitive bidding method	N/A	57.01	37.00	0	84.70	728.57	N/A
• Special procurement method	66.29	154.00	22.66	32.69	0	47.87	N/A
No. of transactions by value	109	185	176	131	145	241	375
• Not exceeding Baht 1,000,000	95	142	160	120	119	221	265
• Baht 1,000,000 - 5,000,000	8	34	14	11	21	15	65
• Baht 5,000,001 - 10,000,000	6	2	1	0	3	2	18
• Baht 10,000,000 or higher	0	7	1	0	2	3	27
Eco-friendly products or services							
• No. of transactions	19	1	8	2	3	140	N/A
• Value (Baht)	7.27	0.03	0.84	0.60	0.08	63.65	N/A
Contract period (No. of suppliers)	N/A	N/A	22	3	17	21	N/A
• Short-term	N/A	N/A	6	1	10	21	N/A
• Medium-term	N/A	N/A	15	2	3	N/A	N/A
• Long-term	N/A	N/A	1	N/A	4	N/A	N/A
Nature of services (No. of suppliers)	N/A	N/A	N/A	131	N/A	119	N/A
• Without contract	N/A	N/A	N/A	102	N/A	119	N/A
• On project-by-project basis	N/A	N/A	N/A	3	N/A	N/A	N/A
• On activity-by-activity basis	N/A	N/A	N/A	26	N/A	N/A	N/A
Procurement locations (No. of suppliers)	N/A	N/A	176	131	N/A	140	N/A
• Thailand	N/A	N/A	174	130	N/A	140	N/A
• Overseas	N/A	N/A	2	1	N/A	0	N/A

RATCH Group specifies the billing and payment process in procurement contracts, scheduling payments within 30 days from the day correct invoices are received.

Procurement transparency

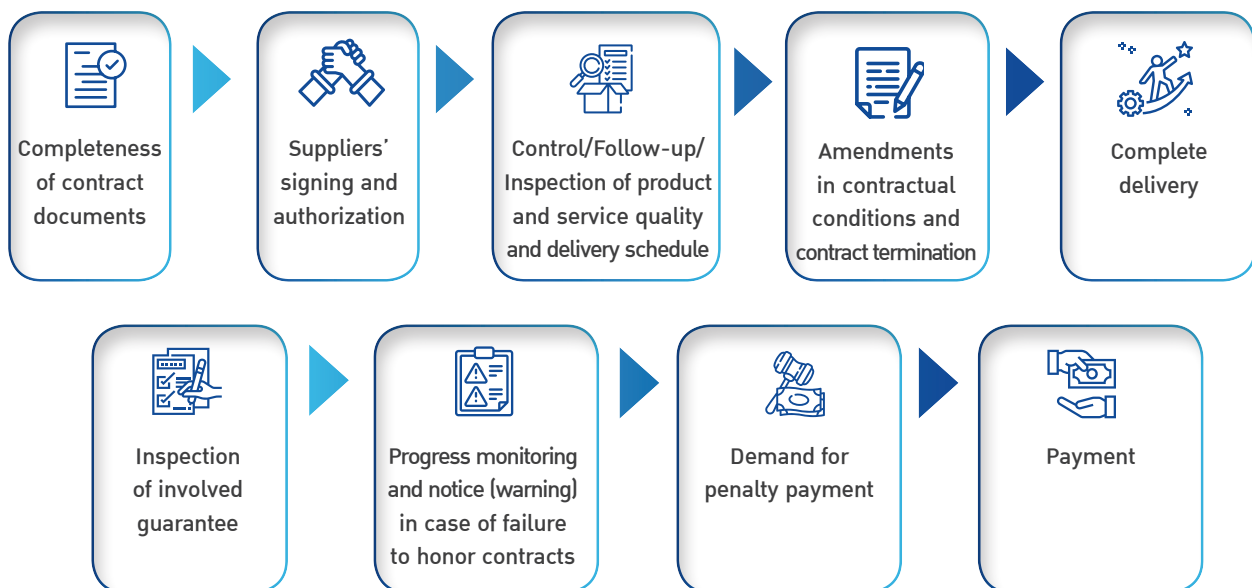
RATCH outlined the procurement procedures that involve producers or distributors of products and services along with the designation of persons authorized to approve the procurement, for transparency, clarity and verifiability.

Price negotiation method	Price Inquiry method	Competitive bidding method	Special procurement method
Value ≤ Baht 100,000	Value ≤ Baht 5 million	Value > Baht 5 million	<ul style="list-style-type: none"> Urgent cases Specific product and service/task or services that demand special expertise Value > Baht 100,000
Authorized persons: Department Heads or higher-level executives	Authorized persons: Executive Vice President or higher-level executives	Authorized persons: Chief Executive officer	Authorized persons: Chief Executive officer

Supplier assessment and management of procurement contracts

Monitoring suppliers' compliance with the contract

To ensure the complete and correct delivery of quality products and services from suppliers to the company per contractual conditions, RATCH is set to monitor suppliers' compliance on the following issues.



Performance in 2022: 100 percent of suppliers dutifully honored the contracts.

Supplier performance assessment

The Procurement Division and the requesting unit will assess supplier performance after the delivery of goods or services. The assessment focuses on quality, work load, delivery and compliance with specified criteria as well as Supplier Code of Conduct. Suppliers with passing scores will be included in the supplier list for future procurement. In 2022, 3 supplier that fail the assessment. RATCH will send suppliers that fail the assessment recommendations for improvement. If the recommendations are rejected, the suppliers will be included in the blacklist.

Post-delivery assessment	No. of suppliers						
	RATCH Group PCL.	Ratchaburi Electricity Generating Co., Ltd.	RATCH Cogeneration Co., Ltd.	Sahacogen (Chonburi) PCL	Nava Nakhon Electricity Generating Co., Ltd.	Berkprai Cogeneration Co., Ltd.	RATCH – Australia Corporation Pty Ltd
Passing suppliers	109	185	175	145	240	130	375
Suppliers with improvement instruction	0	0	1	0	1	1	0
Blacklisted suppliers	0	0	0	0	0	0	0

Management of long-term cooperation

Elevating supplier management for continuous improvement

In 2022, RATCH completed the Supplier Code of Conduct for a more concrete improvement in supplier management. The code of conduct was aligned with international standards and is imposed on all suppliers, requiring their strict compliance and extension of those practices to their suppliers. Products and services from the Company's supply chain will then be welcomed and the suppliers will continue enjoying new orders in the long run.

2023 Plan

RATCH prepared and announced the Supplier Code of Conduct in 2022. In 2023, it will accelerate the communication and publicizing as well as ensure suppliers' understanding in the intention behind the code, so that they can fully apply the best practices. RATCH also plans to devise a supplier monitoring system, focusing on their compliance to the code. The system will monitor and assess their compliance and encompass the performance reporting, improvement guidelines and communications for their acknowledgement and understanding.

Moreover, sustainable supply chain management is part of RATCH's sustainability strategies. The Company thus plans to develop a system for supplier classification and assessment of supplier risks and ESG risks. Next is the development of a relationship management workplan.

Customer Relationship Management and Responsibility for Product and Delivery



Customer management approach

Customers are a vital stakeholder group that propels business growth and continuity. Thus, the company shall commit itself in creating positive experiences for customers, by satisfying their needs and expectations, maintaining production and service efficiency, operating with transparency and building confidence among customers and relevant stakeholders. The customer management approach is as follows:



Customers segment

RATCH operates as a holding company. As such, the customers of its businesses in Thailand and overseas are diverse. Customers in the electricity generating business contribute the largest share of revenue, at 98% of total in 2022 which contribute from EGAT at 89.5% and PEA with industrial customers at 10.5%.

Key performance in 2022

In 2022, RATCH delivered products and services to customers, particularly those in electricity generating business, in Thailand and abroad in full and within specified periods. The distribution of electric power and steam is as follows:

	Electricity (MWh)	Volume of steam (ton)
Total distributed volume	46,084,098.14	630,914.16
RATCH's sharing based on equity	28,238,369.99	269,950.26

Distribution of electric power and steam

Customers in Thailand

There are three main customer groups for electricity power and steam in Thailand

	Electricity buyers					
	Electricity Generating Authority of Thailand (EGAT)		Provincial Electricity Authority (PEA)		Industrial customers	
RATCH's power plants	<ul style="list-style-type: none"> Independent power producer (IPP) Small Power Producer (SPP) Renewable power plants 		<ul style="list-style-type: none"> Very small renewable power plants 		<ul style="list-style-type: none"> Cogeneration small power plant in industrial zones Very small renewable power plants 	
Type of product	Electric power		Electric power		Electric power and steam	
Equity installed capacity (MW)	5,626.91		36.24		467.52	
Electricity distribution (megawatt-hour)	Total	RATCH's Sharing	Total	RATCH's Sharing	Total	RATCH's Sharing
	35,308,373.33	22,790,384.85	295,051.29	138,229.33	1,156,852.87	561,341.82
Volume of steam distribution (ton)	None		None		Total	RATCH's Sharing
					630,914.16	269,950.27

Power plants supplying electric power to Electricity Generating Authority of Thailand (EGAT)

Electricity from fossil fuel power plants (MWh)		Electricity from renewable power plants (MWh)	
Total	RATCH's sharing	Total	RATCH's sharing
31,410,004.18	21,831,129.81	3,898,369.15	959,255.04

Power plant	Equity installed capacity (MW)	Contract period (years)	Electricity distribution (MWh)	Distribution volume by RATCH's sharing (MWh)
Independent Power Producer (IPP)				
Ratchaburi Power Plant	3645.00	2000-2027	14,717,637.55	14,717,637.55
Ratchaburi Power's Power Plant	372.50	2008-2033	1,074,517.70	268,629.42
Hongsa Thermal Power Plant (Lao PDR)	751.20	2015-2040	11,678,264.46	4,671,305.78
Small Power Plants (SPP)				
RATCH Cogeneration	119.75	2013-2038	629,083.90	629,083.90
Ratchaburi World Cogeneration	94.00	2014-2539	1,237,288.25	494,915.30
Nava Nakorn Electricity and Extension Plant	80.63	2016-2041	584,074.23	233,629.69
Berkprai Cogeneration	34.81	2019-2044	583,561.74	204,246.61
Nexif RATCH Energy Rayong	98.00	2022-2047	297,476.23	297,476.23
Sahacogen Chonburi	214.00	1999-2024	608,100.12	314,205.33
Renewable power plants				
Nam Ngum 2 Hydroelectric (Lao PDR)	153.75	2011-2038	1,732,335.47	433,083.87
Xe-Pian Xe-Namnoy Hydroelectric (Lao PDR)	102.50	2019-2046	1,859,288.68	464,822.17
Huay Bong 3 Wind Farm	20.70	2012-2017 (5-year Non-Firm)	167,047.00	33,409.40
Huay Bong 2 Wind Farm	20.70	2013-2018 (5-year Non-Firm)	139,698.00	27,939.60

Power plants distributing electric power to Provincial Electricity Authority (PEA)

Electricity from renewable power plants (MWh)	
Total	RATCH's sharing
295,051.29	138,229.33

Power plants	Equity installed capacity (MWh)	Contract period (years)	Total volume of electricity distribution (MWh)	Volume by RATCH's sharing (MWh)
Renewable power plants				
3 Solar Power projects	8.64	5 years (automatic renewal)	32,017.60	12,807.04
8 Solarta Solar projects	20.73	5 years (automatic renewal)	64,080.86	31,399.62
Songkhla Biomass	3.96	5 years (automatic renewal)	75,203.61	30,081.44
Sahagreen Forest	4.96	2012-2029	66,240.07	34,226.25
Sahacogen Green	2.91	2011-2027	57,509.15	29,714.98

Power plants distributing electric power to industrial users

Electricity from fossil fuel power plants (MWh)		Electricity from renewable power plants (MWh)	
Total	RATCH's sharing	Total	RATCH's sharing
1,156,852.87	561,341.82	630,914.16	269,950.25

Power plant	Equity installed capacity (MWh)	Number of Customer	Total volume of electricity distribution (MWh)	Volume by RATCH's sharing (MWh)	Total volume of steam distribution (ton)	Volume by RATCH's sharing (ton)
Small power plants (SPP)						
RATCH Cogeneration	119.75	26	88,107.22	88,107.22	23,628.98	23,628.98
Ratchaburi World Cogeneration	94.00	9	89,150.22	35,660.09	61,631.21	24,652.48
Nava Nakorn Power Plant and Extension Plant	80.63	45	565,260.50	226,104.20	122,364.34	48,945.73
Berkprai Cogeneration	34.81	1	15,696.12	5,493.64	12,413.04	4,344.56
Sahacogen Chonburi	214.00	50	398,638.81	205,976.67	316,845.91	163,714.28
Renewable power plants						
Sahacogen Green	4.96	2	-	-	94,030.68	4,664.22

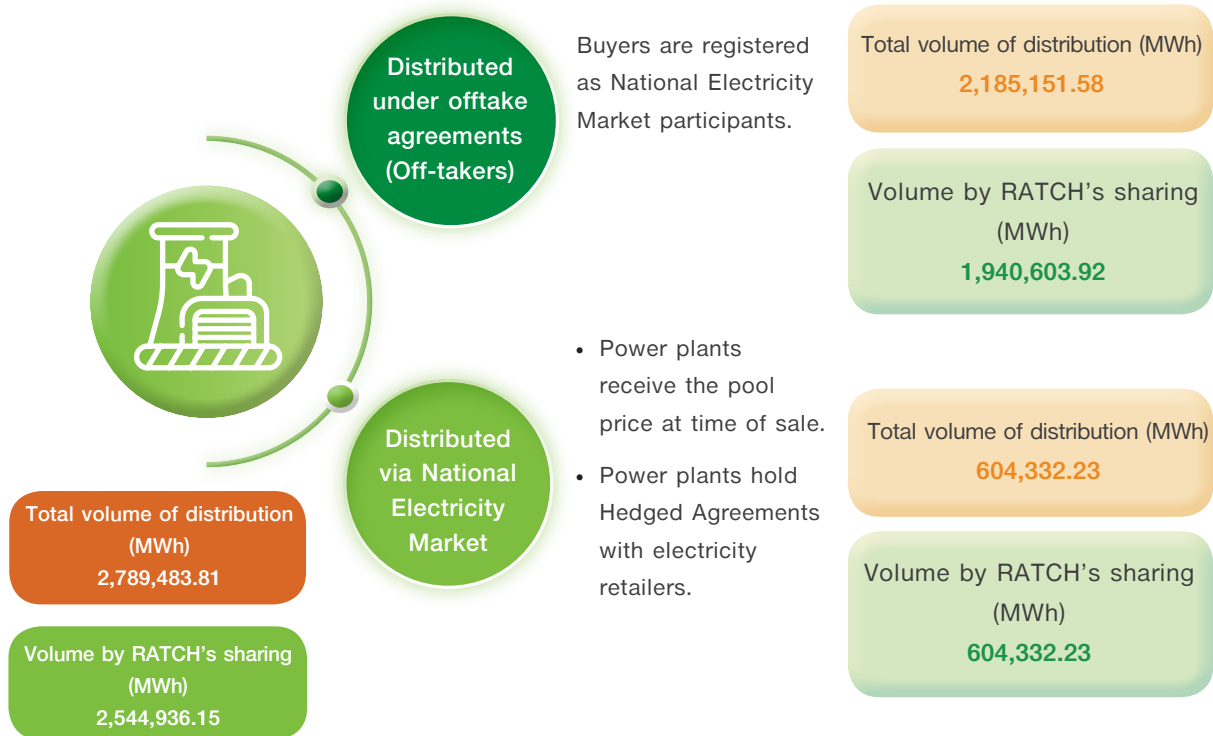
Customers outside Thailand

Foreign customers are mostly the customers in the countries where the company operates in which are Australia, Vietnam, and Indonesia.

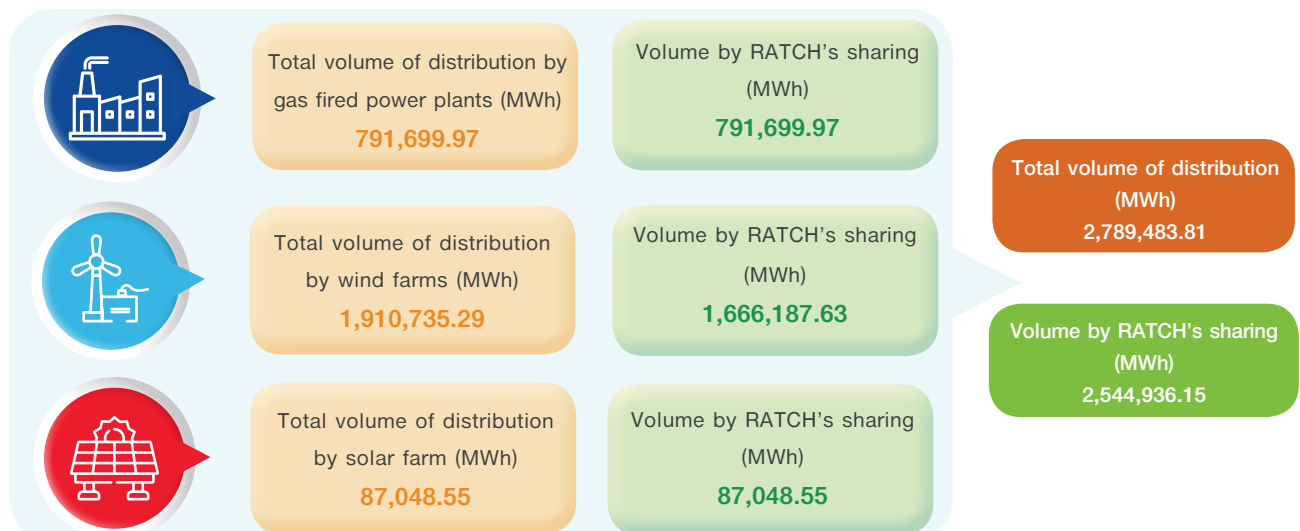
Electricity distribution in Australia



Power plants in Australia distribute their electric power in 3 patterns:



The distributed electricity are generated by the following sources:



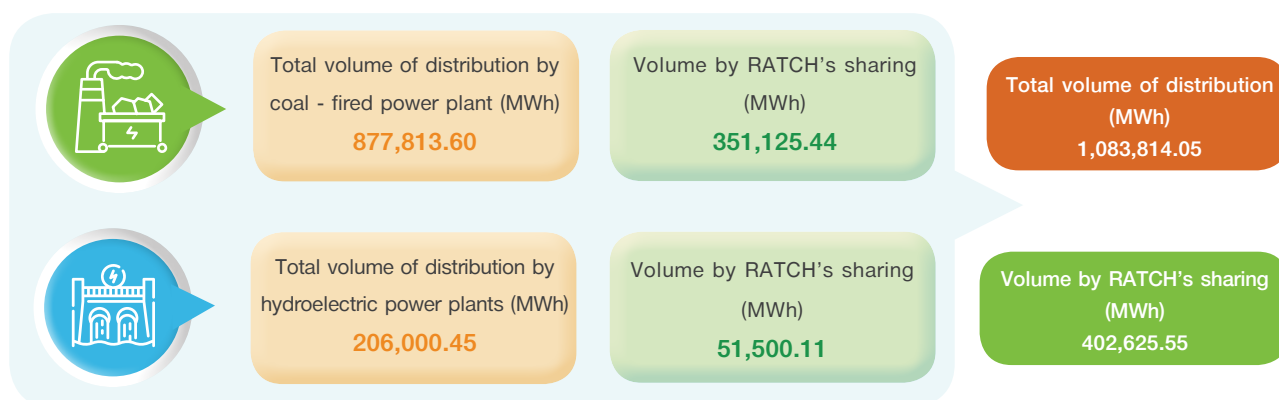
Electric power distributed in 2022, sorted by power plants

Power plant	Fuel type	Equity installed capacity (MW)	Contract period (year)	Total volume of distributed electricity (MWh)	Volume by RATCH's sharing (MWh)
Kemerton	Natural gas	315.20	2005-2030	654,224.97	654,224.97
Townsville	Natural gas	234.00	2005-2025	137,475.00	137,475.00
Starfish Hill	Wind	33.00	2017-2020	83,921.50	83,921.50
Mount Emerald	Wind	180.45	2018-2030	407,322.69	407,322.69
Collinsville	Solar	42.50	2019-2030	87,048.55	87,048.55
Windy Hill	Wind	12.00	Distributed via National Electricity Market	17,503.74	17,503.74
Toora	Wind	21.00		48,258.45	48,258.45
Collector	Wind	226.80		538,570.04	538,570.04
Yandin	Wind	149.94		2021-2035	815,158.87
Total	-	1,214.89	-	2,789,483.81	2,544,936.15

Electricity distribution in Lao PDR



The distributed electricity are generated by the following sources:



Electric power distributed in 2022, sorted by power plants

Power plant	Fuel type	Equity installed capacity (MW)	Contract period (year)	Total volume of distributed electricity (MWh)	Volume by RATCH's sharing (MWh)
Hongsa Power Plant	Coal	751.20	2015-2040	877,813.60	351,125.44
Xe Pian Xe-Namnoy Power Plant	Hydro	102.50	2019-2046	206,000.45	51,500.11

Electricity distribution in Vietnam



The distributed electricity are generated by the following sources:



Total volume of distribution by coal-fired power plant (MWh)
3,178,109.56

Volume by RATCH's sharing (MWh)
700,773.16

Electric power distributed in 2022, sorted by power plants

Power plant	Fuel type	Equity installed capacity (MW)	Contract period (year)	Total volume of distributed electricity (MWh)	Volume by RATCH's sharing (MWh)
Thang Long Power Plant	Coal	136.71	2021-2043	3,178,109.56	700,773.16

Electricity distribution in Indonesia



The distributed electricity are generated by the following sources:



Total volume of distribution by gas-fired power plant (MWh)
1,064,904.00

Volume by RATCH's sharing (MWh)
521,802.9

Total volume of distribution (MWh)
2,272,413.22



Total volume of distribution by hydroelectric power plants (MWh)
1,207,509.22

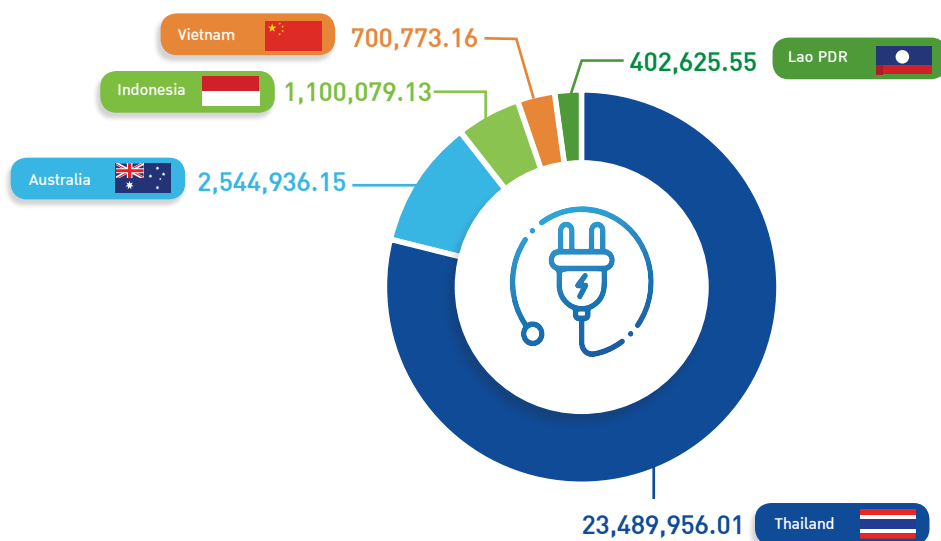
Volume RATCH's sharing (MWh)
578,276.17

Volume by RATCH's sharing (MWh)
1,100,079.13

Electric power distributed in 2022, sorted by power plants

Power plant	Fuel type	Equity installed capacity (MW)	Contract period (year)	Total volume of distributed electricity (MWh)	Volume by RATCH's sharing (MWh)
Riau	Natural gas	145.15	2022-2041	1,064,904.00	521,802.96
Asahan-1	Hydro	86.20	2011-2040	1,207,509.22	578,276.17

Electricity distribution by RATCH's sharing (MWh)



Services

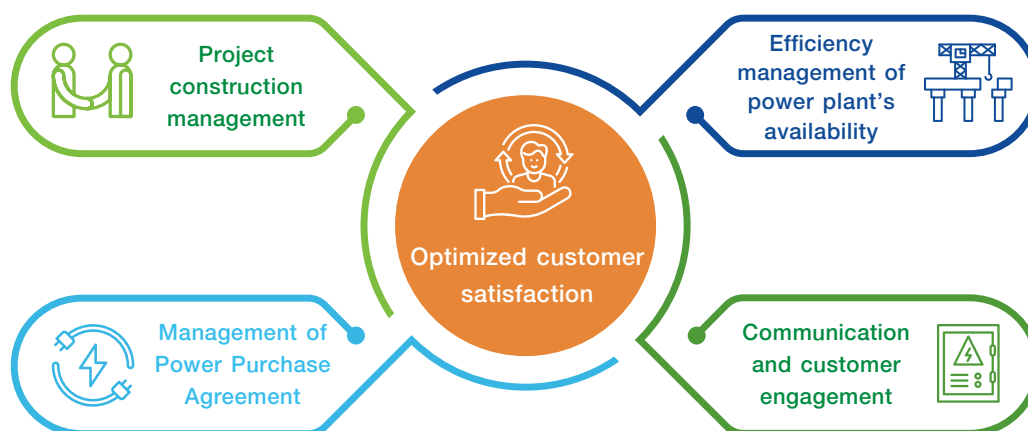
Aside from electricity generation which is the primary business, RATCH has invested in other businesses from infrastructure and electricity and energy-related to healthcare businesses.

Type	Business	Location	Value creation by equity holding (%)
Infrastructure	Transport	Thailand	1.96
	Tap water supply	Abroad	
	Telecom network	Thailand	
	IoT technology	Thailand	
Electricity and energy-related	Operation and maintenance	Thailand	
	Gas turbine maintenance	Thailand	
	Fuel supply	Thailand	
	Wood pellet production and distribution	Abroad	
	Innovation and invention	Thailand	
Healthcare	Private hospital	Thailand/Abroad	

Approach to satisfy customer demands and create positive customer experience

Electricity generation

To fully satisfy customer demands and create memorable customer experience in the electricity generation business, RATCH sets forth the following approach that encompasses actions in the production process through the delivery process.



Managing project construction to meet commercial operation schedule

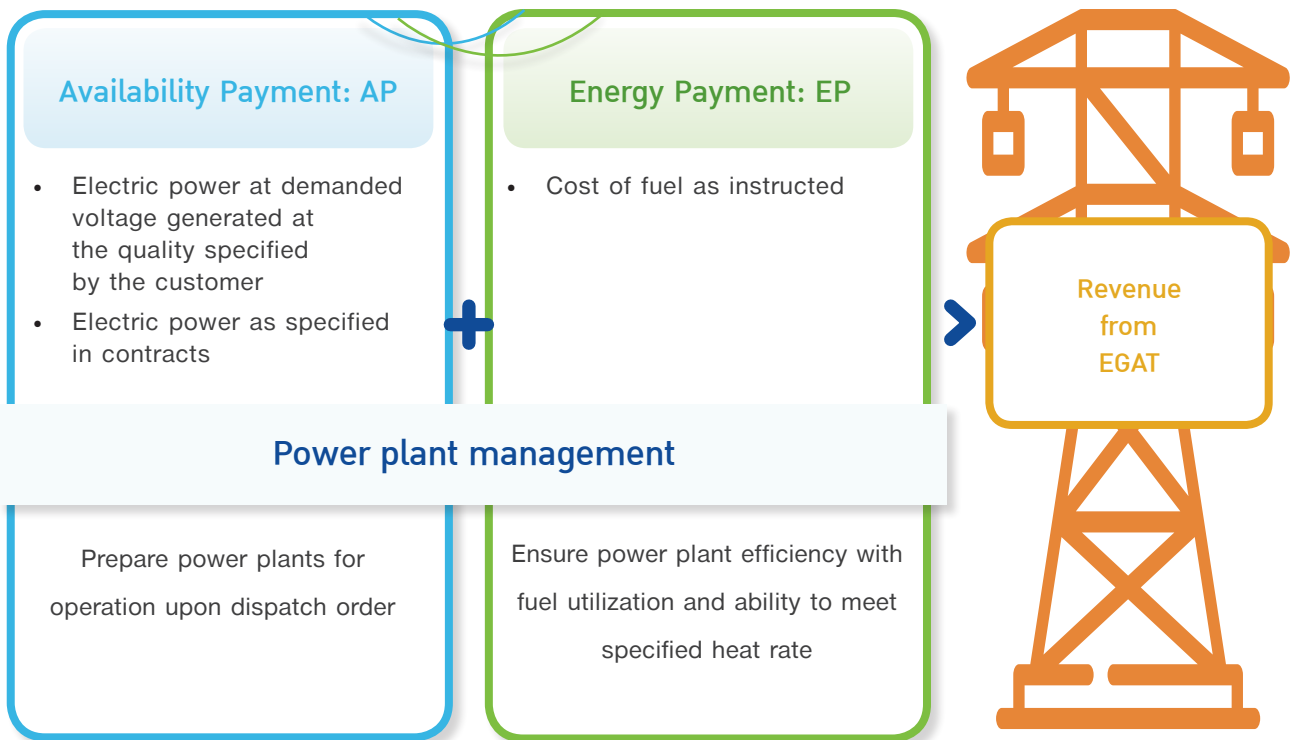
Construction management is considered the beginning of project development plan, to meet schedules and control capacity accordingly to production and deliver targets. Any construction delay will affect the availability payment and may derail the contractual delivery agreement. The Project Development Function is tasked to monitor the progress of under-construction projects against the construction plan. It also supervises budget management and assessment of possible risks in order to fully meet contracts and legal requirements. Strict supervision is required so that machinery and equipment meet the design and the power plants can commence operations and deliver electric power (product) to customers accordingly to the schedules.

Under-construction power plants in 2022 hold combined capacity of 1,635.85 MW.

Location	Project	Equity installed capacity (MW)	Fuel	Scheduled commercial operation date	Customers/ Stakeholders
Thailand	Hin Kong Combined-Cycle Power Plant	785.40	Natural gas	2024-2025	EGAT
	R E N Cogeneration Power Plant	12.48	Natural gas	2024	Industrial users
Vietnam	Nexif Energy Ben Tre	59.60	Wind	2024	Vietnam Electricity Corporation
Indonesia	Sibundong	36.85	Hydro	2027	PT Perusahaan Listrik Negara

Management of Power Purchase Agreements

As the company's principal product is electric power sold under long-term contracts agreed upon in advance of production, the company is obliged to produce and deliver the product in terms of quantity and quality as stated in the contracts. It is also held responsible to support the mission to maintain Thailand's national electricity security. As more than 80.71% of the Group's capacity is sold to the Electricity Generating Authority of Thailand, it is thus extremely crucial to manage the power purchase agreements with EGAT as this directly influences the company's revenue. The revenue from supply to EGAT comes from 2 main parts as follows:



Key factors of power purchase agreement management

(Availability)

- Crucial to customer expectation
- Target availability is set in line with the Contracted Availability Hour (CAH). Inability to maintain contractual availability will result in penalties.
- In case of the power plant can't maintain the availability as specified in the contract. The penalties will be fined by the customer.

(Reliability)

- Set power plants' reliability (the number of operating hours against unplanned outage hours).
- In power purchase agreements, unplanned outage hours are set at 3-5% of contracted availability hour.
- Unplanned outage hour is a key factor to determine availability payment.

(Heat Rate)

- Heat rate reflects customers' cost of electricity.
- Specify Heat rate is specified in PPAs (covering the amount of energy used to generate one kilowatt-hour (kWh)).
- Low heat rate indicates power plants' high efficiency.
- Production efficiency is maintained for optimized resource utilization.

Overall efficiency management of power plants

Power plants' Availability and Reliability performance in 2022

Power plant	Equivalent Availability Factor (EAF)		Reliability Factor: RF	
	Target	Performance	Target	Performance
Ratchaburi Thermal Power Plant Unit 1	96.61	99.71	96.61	99.71
Ratchaburi Thermal Power Plant Unit 2	96.61	100.00	96.61	100.00
Ratchaburi Combined Cycle Power Plant Block 1	89.02	95.93	92.83	98.92
Ratchaburi Combined Cycle Power Plant Block 2	86.12	90.23	93.83	97.72
Ratchaburi Combined Cycle Power Plant Block 3	89.37	94.99	93.20	97.39
Nava Nakorn Cogeneration	95.30	94.64	Not applicable	
Berkprai Cogeneration	92.47	92.09		
RATCH Cogeneration	96.90	97.63	97.98	98.13
Nexif RATCH Energy Rayong	95.00	89.51	no	89.51
Sahacogen Chonburi	99.87	98.01	99.99	99.99

Performance on Heat Rate (Unit: BTU/kilowatt-hour)

Power plant	Natural gas		Bunker oil		Diesel	
	Target	Performance	Target	Performance	Target	Performance
Ratchaburi Thermal Power Plant Unit 1	9,888.87	9,997.12	a secondary fuel to be used by EGAT's order when needed		Not relevant	
Ratchaburi Thermal Power Plant Unit 2	10,483.55	10,794.56				
Ratchaburi Combined Cycle Power Plant Block 1	7,186.97	7,133.68	Not relevant		a secondary fuel to be used by EGAT's order when needed	
Ratchaburi Combined Cycle Power Plant Block 2	7,200.09	7,175.49				
Ratchaburi Combined Cycle Power Plant Block 3	7,195.63	7,168.54				
Nava Nakorn Cogeneration	7,767.51	7,813.12	Not relevant		Not relevant	
Berkprai Cogeneration	7,216.85	7,309.69				
RATCH Cogeneration	7,887.00	7,875.48				
Nexif RATCH Energy Rayong	7,241.00	7,118.39				
Sahacogen Chonburi	8,936.27	8,812.16				

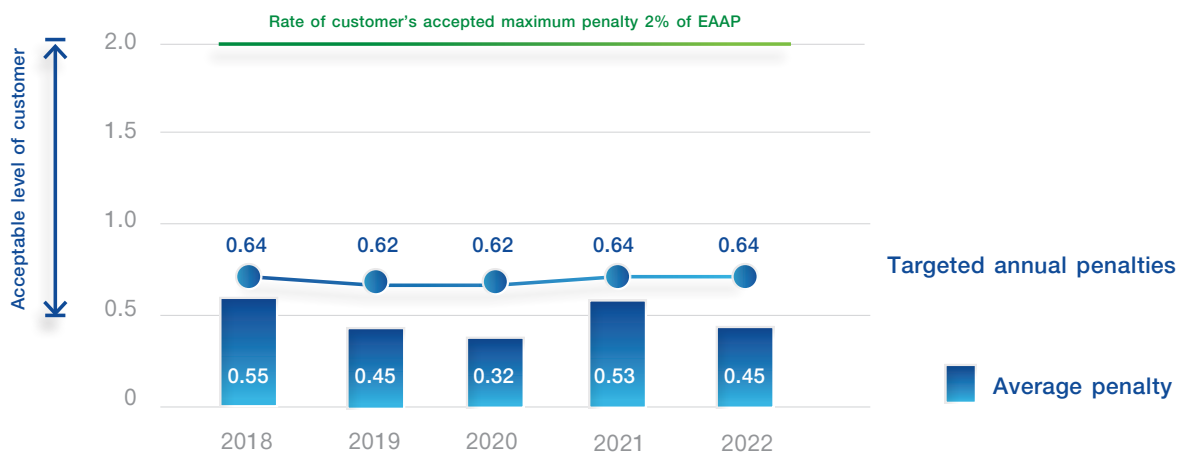
Management of penalties on Ratchaburi Power Plant

Ratchaburi Power Plant, a large-scale power plant with highest contribution to equity installed capacity, is set to avoid or minimize penalties that reflect customer satisfaction. Penalties will be levied on 3 events: Availability drops with advance notice; Availability drops without advance notice; and distribution failure. Penalties are set in a range of 0.5-2% of Expected Annual Availability Payment (EAAP), depending on the severity of impacts on the customer and national electricity system.



Given the capacity of machinery and key equipment accordingly to their ages and the assessment of maximum Availability Payment, Ratchaburi Power Plant capped the penalty ceiling at 0.64% of Expected Annual Availability Payment. The actual penalty in 2022 were 0.45%.

penalty rate of Ratchaburi Power Plant compared to customer's accepted maximum penalty



Management of penalties on small power plants

Penalty clause	Management measures
EGAT as customer	
<p>Under firm power purchase agreements, the power producers are bound to supply no more than 90 megawatts to EGAT. The power plants are notified of demanded supply a month ahead so that they fulfill the orders. EGAT will levy penalties if the power plants cannot fulfill the orders due to the following 2 reasons:</p> <ol style="list-style-type: none"> 1. Power plants fail to fulfil the orders for 18 months, in the past 24 months. 2. Power plants fail to fulfil the orders because of distribution to a third party or their own use. <p>EGAT also sets 2 conditions that are equivalent to penalties:</p> <ol style="list-style-type: none"> 1. Demanded supply will be lowered to match the actual supply in the latest month and specified as such in the new contracts. 2. Power plants must return the Energy Payment accordingly to the lowered supply orders. 	<ul style="list-style-type: none"> • Ensure highest effective availability and reliability of the power plant, and minimize unplanned maintenance as much as possible. • Estimate industrial customers' power demand and plan the production accordingly to their demand, without affecting the contractual supply to EGAT.
Industrial customers	
<p>Under power and steam purchase agreements, industrial customers demand the fixed supply volume of electric power and power plants honor the agreements by distributing electricity based upon reliability standards in power distribution system; System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI).</p>	<ul style="list-style-type: none"> • Enter into power purchase agreements with the Provincial Electricity Authority for supplementary power supply to industrial customers during scheduled maintenance and/or unplanned maintenance, to ensure sufficient supply to industrial customers. • Welcome industrial customers' opinions and recommendations so that power plants can better address their needs.

Communication and customer engagement

To fully address customer demand and ensure interactive operations, power plants need to establish a continuous communications and engagement process. The goal is to learn about customer needs and provide fast, timely and complete responses for their satisfaction.

RATCH's power plants schedule regular meetings with customers to exchange opinions and hear their recommendations. Issues of concern and obstacles are discussed for prompt actions so that customer demand can be completely fulfilled. The power plants implemented the following activities in 2022:

Method/ Platform	Customers/ stakeholders	Frequency (time)	Issues of concern/Targets
Ratchaburi Power Plant			
Meeting	EGAT's management	12/year	Discussion on PPA's issues and find clear mutual understandings about dispatch order
	EGAT's operation	12/year	
Seminar	EGAT's management	2/year	Exchanged ideas and experiences about machinery maintenance and improvement, and production planning
	EGAT's operation	2/year	
CSR activity	EGAT's management	1/year	Included customers in CSR activity to strengthened relationship
	EGAT's operation	1/year	
RATCH Cogeneration Power Plant			
Meeting	Industrial customer's management	1/year	Acknowledged customer's expectations of power plant's efficiency and reliability to supply power and steam Operation and improvement of the power plants was shared with customers to reassure their confidence
	Industrial customer's operation	2/year	
Nava Nakorn Power Plant			
Meeting	EGAT's management	1/year	Discussed issues related generation and ways to improvement
	EGAT's operation	Monthly	
Meeting	Industrial customer's management	Quarterly	Learned about prospect of customers' production plan and concerns related the power plant
	Industrial customer's operation	Quarterly	
Berkprai Cogeneration Power Plant			
Meeting	EGAT's management	1/year	<ul style="list-style-type: none"> Discussed on dispatch order plan of SPP in 2022 in order to manage the power plant's generation planning and distribution Acknowledged EGAT's generation plan and distribution in 2023 Discussed about voltage regulations of transmission system in new year festival.
	EGAT's management	1/year	
	EGAT's operation	1/year	

Method/ Platform	Customers/ stakeholders	Frequency (time)	Issues of concern/Targets
Sahacogen (Chonburi) power plant			
Meeting	EGAT's management	1/year or upon appointment	Learned more about EGAT's demand and satisfaction in service of the plant, as well as strengthened relationship
	EGAT's operation	Quarterly or upon appointment	
	Industrial customer's management	Biannually / or upon appointment	Learned more about customers' need and satisfaction in service of the plant, as well as tightened relationship
	Industrial customer's operation	Quarterly or upon appointment	

Customer satisfaction and responses

Overall customer satisfaction

Customer satisfaction surveys are separately conducted by RATCH's business units, particularly power plant operators that supply electricity to industrial users.

Power Plant	No. of industrial customers	No. of survey respondents	No. of customers of which satisfaction score reached target level	Target satisfaction score in 2022 (%)	Average satisfaction score in 2022 (%)
RATCH Cogeneration Power Plant	26	25	18	80.00	94.77
Nava Nakom Cogeneration Power Plant	45	44	31	85.00	92.68
Berkprai Cogeneration Power Plant	1	1	1	75.00	95.83
Sahacogen (Chonburi) power plant	50	50	50	90.00	90.87
Average					92.96

Actions to satisfy customer demand

Issue	Action
Ratchaburi Power Plant	
Secondary fuel management	Arranged a meeting to determine procurement of bunker oil (secondary fuel of thermal power plants) to serve the power demand sufficiently
RATCH Cogeneration Power Plant	
EGAT customer Supply contractual and quality electric power	Completely generated and distributed electric power according to EGAT's dispatch order and complied with all conditions of the contract entire year.
Industrial customer Efficient power distribution	Improved distribution system ensuring stability and reliability of power and steam distribution according to the contracts
Satisfaction	Result of customer satisfaction survey: overall 94.77% <ul style="list-style-type: none"> • Customers of power product: 95.70% • Customers of steam product : 77.00%

Issue	Action
Nava Nakorn Cogeneration Power Plant	
EGAT customer Supply contractual and quality electric power	Improved efficiency of the power plant ensuring reliability of power and steam generation and distribution according to the contract and power purchase plan at all times
Industrial customers Efficient power distribution	Initiated solar rooftop policy and power distribution system improvement
Berkprai Cogeneration Power Plant	
EGAT customer Voltage regulation of transmission system in new year festival	Decreased generation duration to 80 hours from year end of 2022 to beginning of 2023 in response with EGAT's demand.
Industrial customer Provide supply risk management to customers during the planned outage of the power plant	<ul style="list-style-type: none"> Notified the customer promptly when mistake was taken place in the power plant's operation which possibly caused of distribution failure, as well as advise the customer the power plant's planned outage Worked with the customer to prepare power supply management plan and supply risk management prior to the planned outage of the power plant
Sahacogen (Chonburi) power plant	
Industrial customer Provide stability and continuity of power and steam delivery	Initiated the power plant's improvement plan and implement it in order to increase stability of distribution system and customer's satisfaction

Product Responsibility

The Group's primary products delivered to customers in the year remained energy-related, as electric power and steam. Both contributed 98% of the Group's revenue. They were generated and delivered accordingly to customer requirements at different periods of time, at the volume based on the power/steam purchase agreements with each customer.

Each power plant is therefore required to maintain the availability and reliability, for prompt production and delivery at the order of customers. In 2022, RATCH's operational controlled power plants generated and delivered a total of 28,238,369.99 megawatt-hour of electricity.

Regarding the production process, all power plants emphasized resource optimization. The environmental quality was managed in line with relevant law and regulations, the Environmental Impact Assessment reports, and environmental management and safety standards, to ensure minimum impacts on the environment and community and respond to customers' expectations for eco-friendly and safe product. The emissions of pollutant were maintained within standard limits aside from the plan to reduce greenhouse gas emissions per kilowatt-hour, to reduce customers' Scope 2 emissions and demonstrate their responsibility for stakeholders, society and community in a fair and comprehensive manner.

In the year, RATCH's core power plants received zero community complaint relating to environmental and social impacts. (Details on the performance of environmental impact management; preservation and conservation of biodiversity; safety and occupational health; and community and social stewardship appeared in pages 115,135,147 and 185 respectively.)



Performance Data 2022

Abbreviation

RATCH	= RATCH Group PCL.	SCG	= Sahacogen (Chonburi) Power Plant
RGCO	= Ratchaburi Power Plant	SGN	= Sahacogen Green Power Plant
NNEG	= Nava Nakorn Electricity Power Plant	SGF	= Sahagreen Forest Power Plant
BPC	= Berkprai Cogeneration Power Plant	RL	= RATCH-Lao Services Company Limited
RCO	= RATCH Cogeneration Power Plant	FRD	= Fareast Renewable Development Pte. Ltd. (Asahan-1 Hydroelectric Power Plant, Indonesia)
NRER	= Nexif RATCH Energy Rayong Power Plant	AWC	= Asia Water Company Limited
RAC	= RATCH-Australia Corporation Pty Ltd		

Economic

Data	Unit	2022	2021	2020
Revenues	Million THB	81,788.08	44,342.65	39,521.99
Operating costs	Million THB	69,286.60	33,116.50	30,228.69
Employee wages and benefits	Million THB	941.28	707.12	705.01
Dividend to all shareholders	Million THB	3,697.50	3,480.00	3,480.00
Payments to government	Million THB	778.60	617.70	572.45
Community investments	Million THB	239.32	179.99	185.75
Spent on local suppliers				
Company in Thailand ^[1]	Million THB	66,250.66 (96.74%)	36,556.33 (97.53%)	36,104.91 (97.29%)
Company in Australia (RAC)	Million AUD	66.75 (97.53%)	45.54 (99.91%)	18.39 (99.88%)
Spent on foreign suppliers				
Company in Thailand ^[1]	Million THB	2,229.05 (3.26%)	926.55 (2.47%)	1,006.59 (2.71%)
Company in Australia (RAC)	Million AUD	1.69 (2.47%)	0.04 (0.09%)	0.02 (0.11%)

Remark : ^[1] Operations in Thailand include RATCH, RGCO, NNEG, BPC, RCO, NRER and SCG.

Health and Safety ^[2]

Data	Unit	2022	2021	2020	
Total number of organization					
RATCH	Employees	person (Male : Female)	113 : 109	108 : 107	105 : 105
	Workers	person (Male : Female)	33 : 23	36 : 23	35 : 22
RGCO	Employees	person (Male : Female)	22 : 25	28 : 24	29 : 25
	Workers	person (Male : Female)	298 : 83	296 : 77	295 : 76
NNEG	Employees	person (Male : Female)	17 : 13	15 : 15	19 : 15
	Workers	person (Male : Female)	961 : 9	69 : 9	339 : 98
BPC	Employees	person (Male : Female)	8 : 11	8 : 11	8 : 11
	Workers	person (Male : Female)	39 : 11	41 : 12	39 : 12
RCO	Employees	person (Male : Female)	7 : 6	23 : 6	2 : 1
	Workers	person (Male : Female)	391 : 46	429 : 53	30 : 9

Data		Unit	2022	2021	2020
NRER	Employees	person (Male : Female)	26 : 5	-	-
	Workers	person (Male : Female)	22 : 1	-	-
SCG Group	Employees	person (Male : Female)	125 : 56	-	-
	Workers	person (Male : Female)	663 : 92	-	-
RAC	Employees	person (Male : Female)	19 : 5	16 : 7	18 : 5
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
RL	Employees	person (Male : Female)	194 : 20	159 : 20	157 : 20
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
FRD (Asahan-1)	Employees	person (Male : Female)	17 : 3	-	-
	Workers	person (Male : Female)	88 : 7	-	-
Number of Hours Worked					
RATCH	Employees	Hours worked	405,096.0	409,360.0	402,328.0
	Workers	Hours worked	171,560.0	179,876.0	331,424.0
RGCO	Employees	Hours worked	85,630.0	92,260.0	97,255.0
	Workers	Hours worked	1,285,343.0	1,781,760.0	1,372,906.0
NNEG	Employees	Hours worked	57,264.0	56,144.0	65,824.0
	Workers	Hours worked	245,563.5	175,537.0	884,970.0
BPC	Employees	Hours worked	25,544.0	22,520.0	32,264.0
	Workers	Hours worked	129,846.0	128,331.0	180,906.0
RCO	Employees	Hours worked	17,944.0	43,616.0	5,808.0
	Workers	Hours worked	608,356.0	154,544.0	127,835.0
NRER	Employees	Hours worked	58,188.3	-	-
	Workers	Hours worked	754,410.0	-	-
SCG Group	Employees	Hours worked	394,482.5	-	-
	Workers	Hours worked	889,056.5	-	-
RAC	Employees	Hours worked	36,863.9	37,534.9	41,814.2
	Workers	Hours worked	0.0	0.0	0.0
RL	Employees	Hours worked	524,018.7	391,920.0	389,416.0
	Workers	Hours worked	0.0	0.0	0.0
FRD (Asahan-1)	Employees	Hours worked	39,984.0	-	-
	Workers	Hours worked	215,961.0	-	-
Total workforce represented in formal joint management-worker health and safety committees					
RATCH		persons (%)	9 (3.24%)	9 (3.28%)	9 (3.37%)
RGCO		persons (%)	15 (3.51%)	15 (3.52%)	15 (3.53%)
NNEG		persons (%)	11 (1.10%)	11 (10.19%)	16 (3.40%)
BPC		persons (%)	11 (15.94%)	11 (15.28%)	11 (15.71%)
RCO		persons (%)	5 (1.11%)	5 (0.98%)	5 (11.90%)

Data	Unit	2022	2021	2020
NRER	persons (%)	6 (11.11%)	-	-
SCG Group	persons (%)	33 (3.53%)	-	-
RAC	persons (%)	5 (20.83%)	5 (21.74%)	5 (21.74%)
RL	persons (%)	0	0	0
FRD (Asahan-1)	persons (%)	3 (2.61%)	0	0

Number of Fatalities (result of work-related injuries) by Gender

RATCH	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
RGCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	1 : 0	0 : 0
NNEG	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
BPC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
RCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	1 : 0	0 : 0	0 : 0
NRER	Employees	person (Male : Female)	0 : 0	-	-
	Workers	person (Male : Female)	0 : 0	-	-
SCG Group	Employees	person (Male : Female)	0 : 0	-	-
	Workers	person (Male : Female)	0 : 0	-	-
RAC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
RL	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0
FRD (Asahan-1)	Employees	person (Male : Female)	0 : 0	-	-
	Workers	person (Male : Female)	0 : 0	-	-

Fatalities Rate (FR) by Gender

RATCH	Employees	No/200,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RGCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0.14 : 0	0 : 0
NNEG	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
BPC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0.33 : 0	0 : 0	0 : 0

Data		Unit	2022	2021	2020	
NRER	Employees	No/200,000 Hours worked (Male : Female)	0 : 0	-	-	
	Workers		0 : 0	-	-	
SCG Group	Employees		0 : 0	-	-	
	Workers		0 : 0	-	-	
RAC	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
RL	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
FRD (Asahan-1)	Employees		0 : 0	-	-	
	Workers		0 : 0	-	-	
Number of high-consequence work-related injuries						
RATCH	Employees		person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RGCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
NNEG	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
BPC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
NRER	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	
SCG Group	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	
RAC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RL	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
FRD (Asahan-1)	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	
Rate of high-consequence work-related injuries						
RATCH	Employees	No/200,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
RGCO	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	

Data		Unit	2022	2021	2020	
NNEG	Employees	No/200,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
BPC	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
RCO	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
NRER	Employees		0 : 0	-	-	
	Workers		0 : 0	-	-	
SCG Group	Employees		0 : 0	-	-	
	Workers		0 : 0	-	-	
RAC	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
RL	Employees		0 : 0	0 : 0	0 : 0	
	Workers		0 : 0	0 : 0	0 : 0	
FRD (Asahan-1)	Employees		0 : 0	-	-	
	Workers		0 : 0	-	-	
Number of recordable work-related injuries						
RATCH	Employees		person (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RGCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	4 : 1	0 : 0	
NNEG	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	1 : 0	0 : 0	0 : 0	
BPC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RCO	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
NRER	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	
SCG Group	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	
RAC	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
RL	Employees	person (Male : Female)	0 : 0	0 : 0	0 : 0	
	Workers	person (Male : Female)	0 : 0	0 : 0	0 : 0	
FRD (Asahan-1)	Employees	person (Male : Female)	0 : 0	-	-	
	Workers	person (Male : Female)	0 : 0	-	-	

Data		Unit	2022	2021	2020
Rate of recordable work-related injuries					
RATCH	Employees	No/200,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RGCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0.56 : 0.58	0 : 0
NNEG	Employees		0 : 0	0 : 0	0 : 0
	Workers		1.32 : 0	0 : 0	0 : 0
BPC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
NRER	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
SCG Group	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
RAC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RL	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
FRD (Asahan-1)	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
Number of Fatalities (result of work-related ill health)					
Employees	person (Male : Female)		0 : 0	0 : 0	0 : 0
Workers	person (Male : Female)		0 : 0	0 : 0	0 : 0
Fatalities rate (result of work-related ill health)					
Employees	person (Male : Female)		0 : 0	0 : 0	0 : 0
Workers	person (Male : Female)		0 : 0	0 : 0	0 : 0
Number of cases of recordable work-related ill health					
Employees	person (Male : Female)		0 : 0	0 : 0	0 : 0
Workers	person (Male : Female)		0 : 0	0 : 0	0 : 0
Rate of recordable work-related ill health					
Employees	person (Male : Female)		0 : 0	0 : 0	0 : 0
Workers	person (Male : Female)		0 : 0	0 : 0	0 : 0

Data		Unit	2022	2021	2020
Lost-Time Injury Frequency Rate (LTIFR)					
RATCH	Employees	No/1,000,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RGCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	1.39 : 0	0 : 0
NNEG	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
BPC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
NRER	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
SCG Group	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
RAC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RL	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
FRD (Asahan-1)	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
Total Injury Frequency Rate (TIFR)					
RATCH	Employees	No/1,000,000 Hours worked (Male : Female)	0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RGCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	4.18 : 2.88	0.68 : 0
NNEG	Employees		0 : 0	0 : 0	0 : 0
	Workers		6.61 : 0	0 : 0	0 : 0
BPC	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
RCO	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	14.95 : 0
NRER	Employees		0 : 0	-	-
	Workers		0 : 0	-	-
SCG Group	Employees		0 : 0	-	-
	Workers		0 : 0	-	-

Data		Unit	2022	2021	2020
RAC	Employees	No/1,000,000 Hours worked (Male : Female)	0 : 0	0 : 0	23.9 : 0
	Workers		0 : 0	0 : 0	0 : 0
RL	Employees		0 : 0	0 : 0	0 : 0
	Workers		0 : 0	0 : 0	0 : 0
FRD (Asahan-1)	Employees		0 : 0	-	-
	Workers		0 : 0	-	-

Remark : ^[2] Presented information covers safety data of RATCH, RGCO, NNEG, BPC, RCO, NRER, SCG Group, RAC, RL and FRD (Asahan-1)
All Employees of RATCH, RGCO, NNEG, BPC, RCO, NRER, SCG Group are Thai, RAC's employees are Australian and Thai,
RL's employees are Laos and Thai and FRD's (Asahan-1) employees are Thai and Indonesian.

People^[3]

Data	Unit	2022		2021		2020	
		Male	Female	Male	Female	Male	Female
Total Employees	Persons	520		474		468	
	Persons	354	166	315	159	310	158
Employee by employment contract							
Permanent	Persons	324	164	314	159	309	158
Temporary	Persons	30	2	1	0	1	0
Employee by age group							
<30 years	Persons	117	29	113	27	120	28
30-50 years	Persons	194	122	157	116	141	116
>50 years	Persons	41	17	45	16	49	14
Employee by category							
Top Management	Persons	16	4	13	4	14	6
	%	3.08	0.77	2.74	0.84	2.99	1.28
Middle Management	Persons	38	20	35	19	39	19
	%	7.31	3.85	7.38	4.01	8.33	4.06
Junior Management	Persons	44	37	38	36	36	34
	%	8.46	7.12	8.02	7.59	7.69	7.26
Officer	Persons	256	103	228	100	220	99
	%	49.23	19.81	48.10	21.10	47.01	21.15
Worker	Persons	0	2	1	0	1	0
	%	0.00	0.38	0.21	0.00	0.21	0.00

Data	Unit	2022		2021		2020	
		Male	Female	Male	Female	Male	Female
Employee by Nationality							
Thai	%	55.19		58.44		58.33	
Lao	%	40.96		37.34		37.39	
Australian	%	3.85		4.22		4.27	
Other	%	0.00		0.00		0.00	
New Hires by Age Group							
<30 years	Persons	42	8	14	7	40	5
	%	8.1	1.5	3.0	1.5	8.5	1.1
30-50 years	Persons	28	7	1	5	3	7
	%	5.4	1.3	0.2	1.1	0.6	1.5
>50 years	Persons	1	0	1	1	1	0
	%	0.2	0.0	0.2	0.2	0.2	0.0
Total	Persons	71	15	16	13	44	12
	%	13.7	2.9	3.4	2.7	9.4	2.6
Turnover by Age Group							
<30 years	Persons	4	6	5	2	41	2
	%	0.8	1.2	1.1	0.4	8.8	0.4
30-50 years	Persons	11	5	1	7	3	7
	%	2.1	1.0	0.2	1.5	0.6	1.5
>50 years	Persons	0	0	8	2	5	2
	%	0.0	0.0	1.7	0.4	1.1	0.4
Total	Persons	15	11	14	11	49	11
	%	2.9	2.1	3.0	2.3	10.5	2.4
Parental leave							
Parental leave	Persons	-	4	-	10	-	5
Returning to work after parental leave ended	Persons	-	8	-	6	-	4
Returning to work after parental leave ended (12 months after return to work)	Persons	-	8	-	9	-	0
Training and Development							
Top Management	hour/person/year	25.97	23.25	4.23	5.50	26.86	16.67
Middle Management	hour/person/year	33.36	26.78	23.49	22.71	57.95	47.49
Junior Management	hour/person/year	48.86	53.49	61.79	36.06	44.11	40.52
Officer	hour/person/year	27.41	19.67	20.41	17.01	24.88	24.72
Worker	hour/person/year	0.00	0.00	0.00	0.00	0.00	0.00

Data	Unit	2022		2021		2020	
		Male	Female	Male	Female	Male	Female
Employee receiving career development review							
Top Management	%	100		100		100	
Middle Management	%	100		100		100	
Junior Management	%	100		100		100	
Officer	%	100		100		100	
Worker	%	100		100		100	
Employee receiving regular performance review							
Top Management	%	100		100		100	
Middle Management	%	100		100		100	
Junior Management	%	100		100		100	
Officer	%	100		100		100	
Worker	%	100		100		100	
Grievance							
Total number of grievance about labor practices through formal grievance process	Case	0	0	0	0	0	0
Total number of grievance addressed	Case	0	0	0	0	0	0
Total number of grievance resolved	Case	0	0	0	0	0	0
Total number of grievance about human rights through formal grievance process	Case	0	0	0	0	0	0
Total number of grievance addressed	Case	0	0	0	0	0	0
Total number of grievance resolved	Case	0	0	0	0	0	0

Remark : ^[3] Presented employee data are of RATCH, RGCO, RCO, RAC, and RL

Environment ^[4]

Data	Unit	2022	2021	2020
Energy ^[5]				
Total energy consumption	TJ	95,580	74,390	79,644
Total direct energy consumption	TJ	175,801	134,456	135,509
• Natural Gas	TJ	160,794	127,711	135,430
• Bunker Oil	TJ	11,563	6,408	0
• Diesel Oil	TJ	804	337	79
• Biomass	TJ	2,641	0	0

Data	Unit	2022	2021	2020
Total Indirect Energy Consumption	TJ	628	251	172
• Electricity purchased	TJ	628	251	172
• Heating purchased	TJ	0	0	0
• Steam purchased	TJ	0	0	0
Total energy sold	TJ	80,849	60,317	56,037
• Electricity sold	TJ	78,460	59,845	55,588
• Heating sold	TJ	0	0	0
• Steam sold	TJ	2,389	472	449
Net Generation (Total)	MWh	21,794,359	16,623,713	15,441,032
Net Generation (Only Fossil Fuel)	MWh	20,487,985	14,976,597	15,243,611
Total energy intensity (within organization)	GJ/MWh	8.07	8.09	8.78
Total Energy Reduction	GJ	203,179	352,852	254,091
• Fuel saving	GJ	24,939	144,003	43,376
• Electricity saving	GJ	178,242	208,850	210,715
• Steam saving	GJ	0	0	0
GHG Emission^[6]				
Direct GHG emissions (Scope 1)	tCO ₂ e	8,515,892	6,412,471	6,258,865
Indirect GHG emissions (Scope 2)	tCO ₂ e	84,606	38,918	26,960
Total GHG emissions (Scope 1 + 2)	tCO ₂ e	8,600,498	6,451,389	6,285,826
GHG emission intensity (Scope 1 + 2)	tCO ₂ e/MWh	0.4198	0.4308	0.4124
Other Indirect GHG emissions (Scope 3) ^[7]	tCO ₂ e	3,025,526	2,662,156	3,131
Total GHG emissions reductions	tCO ₂ e	28,089	48,995	35,282
Emission^[8]				
NO _x emissions	Tons	4,939	2,945	3,228
	kg/MWh	0.24	0.20	0.21
SO _x emissions	Tons	1,700.0	1,462.2	1,057.4
	kg/MWh	0.08	0.10	0.07
Opacity	%	5.27	3.21	0.69
TSP	Tons	406.3	165.2	260.8
Water^[9]				
Total water withdrawal	Million m ³	28.92	16.24	16.42
• Surface water (total)	Million m ³	23.53	12.59	12.83
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	23.53	12.59	12.83
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
• Groundwater (total)	Million m ³	0	0	0
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0

Data	Unit	2022	2021	2020
• Seawater (total)	Million m ³	0	0	0
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
• Produced water (total)	Million m ³	0	0	0
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
• Third-party water (total)	Million m ³	0.43	0.79	1.12
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0.40	0.48	0.95
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0.03	0.31	0.17
• Third-party water (total) in Water Stress Area	Million m ³	4.95	2.86	2.47
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	4.95	2.86	2.47
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0
Recycled and reused water	m ³	1,538,078	1,535,811	1,464,838
	% of total water withdrawal	5.32	9.46	8.92
Water Footprint	m ³ /MWh (net)	1.33	0.98	1.06
Total water discharge	Million m³	9.86	2.21	2.69
• Surface water	Million m ³	3.03	1.99	2.48
• Ground Water	Million m ³	0	0	0
• Seawater	Million m ³	0	0	0
• Centralized wastewater treatment facility	Million m ³	0.44	0	0
• Third-party water	Million m ³	6.39	0.22	0.20
Water discharge by freshwater and other water				
Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	9.56	1.51	2.57
Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0.30	0.70	0.12
COD loading	Tons	130	81	107
BOD loading	Tons	13	10	10
Total water consumption	Million m³	19.06	14.03	13.73
Waste^[10]				
Total Waste	Tons	30,649.3	5,405.2	4,289.6
• Waste diverted from disposal by recovery operation	Tons	29,818.6	5,041.3	3,880.7
• Waste directed to disposal by disposal operation	Tons	830.7	363.9	408.9
Total hazardous waste	Tons	401.6	366.4	398.9
• Waste diverted from disposal by recovery operation	Tons	32.5	79.4	83.4
Preparation for reuse	Tons	0	0	0
Recycling	Tons	20.6	79.4	83.4
Other recovery operations	Tons	11.9	0	0

Data	Unit	2022	2021	2020
• Waste directed to disposal by disposal operation	Tons	369.1	287.0	315.5
Incineration (with energy recovery)	Tons	186.7	249.1	273.9
Incineration (without energy recovery)	Tons	10.7	12.9	0
Landfilling	Tons	33.7	5.3	38.2
Other disposal operations	Tons	137.0	16.4	0
Onsite Storage	Tons	1.0	3.3	3.4
Total non-hazardous waste	Tons	30,247.7	5,038.7	3,890.7
• Waste diverted from disposal by recovery operation	Tons	29,786.1	4,961.8	3,797.4
Preparation for reuse	Tons	15.3	0	0
Recycling	Tons	6,435.7	4,961.8	3,795.3
Other recovery operations	Tons	23,335.2	0	2.1
• Waste directed to disposal by disposal operation	Tons	461.6	76.9	93.4
Incineration (with energy recovery)	Tons	0	9.4	0
Incineration (without energy recovery)	Tons	1.3	0	0.5
Landfilling	Tons	452.7	53.8	90.2
Other disposal operations	Tons	0.9	11.8	0
Onsite Storage	Tons	6.6	2.0	2.7

Remark : ^[1] Operations in Thailand include RATCH, RGCO, NNEG, BPC, RCO, NRER and SCG Group.

^[4] Presented environmental data are of RGCO, NNEG, BPC, RCO, NRER, SCG Group, RAC and FRD (Asahan-1).

^[5] Energy consumption are calculated based on conversion factors for stationary combustion in the energy industries from Thai Energy Statistics 2018.

^[6] GHG Emission of RGCO, NNEG, RCO, NRER and SCG Group are calculated based on the assessment Methodology of Carbon Footprint for Organization developed by TGO (5th edition, January 2021) that are calculated from CO₂ / CH₄ / N₂O / R-134a / R-407c / R-410a and SF₆ Base year of GHG calculation is 2015.

GHG Emission of BPC are calculated based on CO₂ emission factors from IPCC Volume 2 Energy.

- For Natural Gas, CO₂ emission factor = 56,100 kgCO₂ /TJ on Net Calorific Basis.
- For Diesel Oil, CO₂ emission factor = 74,100 kgCO₂ /TJ on Net Calorific Basis.

GHG Emission of RAC follow National Greenhouse and Energy Reporting Act.

^[7] Other Indirect GHG Scope 3 only included RGCO, NNEG, RCO, NRER and SCG Group.

^[8] Emission of RGCO, NNEG, BPC, RCO, NRER and SCG are calculated from the Continuous Emission Monitoring Systems (CEMs) and RAC used calculation method of the Queensland Department of Environment and Science.

^[9] The data are measured from metering.

^[10] The data are measured from Manifest System and weight scale.

GRI Content Index 2022



Statement of use	RATCH Group Public Company Limited has reported in accordance with the GRI Standards for the period from 1 January 2022 to 31 December 2022.
GRI 1 used	GRI 1: Foundation 2021
Applicable GRI Sector Standard(s)	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
General disclosures						
GRI 2: General Disclosures 2021	2-1 Organizational details	35-43	-	-	-	-
	2-2 Entities included in the organization's sustainability reporting	14	-	-	-	-
	2-3 Reporting period, frequency and contact point	14-16	-	-	-	-
	2-4 Restatements of information	14-15	-	-	-	-
	2-5 External assurance	15, 269	-	-	-	-
	2-6 Activities, value chain and other business relationships	34, 35-42	-	-	-	-
	2-7 Employees	43, 250	-	-	-	-
	2-8 Workers who are not employees	158, 242	-	-	-	-
	2-9 Governance structure and composition	60-61	-	-	-	-
	2-10 Nomination and selection of the highest governance body	62	-	-	-	-
	2-11 Chair of the highest governance body	61	-	-	-	-
	2-12 Role of the highest governance body in overseeing the management of impacts	60, 65	-	-	-	-
	2-13 Delegation of responsibility for managing impacts	86, 89	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 2: General Disclosures 2021	2-14 Role of the highest governance body in sustainability reporting	15, 60, 65, 5	-	-	-	-
	2-15 Conflicts of interest	78-83	-	-	-	-
	2-16 Communication of critical concerns	22-25, 60, 65, 84	-	-	-	-
	2-17 Collective knowledge of the highest governance body	64	-	-	-	-
	2-18 Evaluation of the performance of the highest governance body	70	-	-	-	-
	2-19 Remuneration policies	71, 177	-	-	-	-
	2-20 Process to determine remuneration	71, 177-179	-	-	-	-
	2-21 Annual total compensation ratio	178	-	-	-	-
	2-22 Statement on sustainable development strategy	5-7, 17-21, 30-33	-	-	-	-
	2-23 Policy commitments	4, 17-21, 60, 72-73, 79-83, 91-93, 141-143	-	-	-	-
	2-24 Embedding policy commitments	17-21, 72-73, 79-80, 83, 86-90, 93-106, 143-146	-	-	-	-
	2-25 Processes to remediate negative impacts	30-33, 185-201	-	-	-	-
	2-26 Mechanisms for seeking advice and raising concerns	78-80, 84, 146, 184, 190-192	-	-	-	-
	2-27 Compliance with laws and regulations	75-77	-	-	-	-
	2-28 Membership associations	56-59	-	-	-	-
	2-29 Approach to stakeholder engagement	44-53	-	-	-	-
2-30 Collective bargaining agreements	142,146, 184	-	-	-	-	

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
Material topics						
GRI 3: Material Topics 2021	3-1 Process to determine material topics	26-28	-	-	-	-
	3-2 List of material topics	29	-	-	-	-
Economic performance						
GRI 3: Material Topics 2021	3-3 Management of material topics	30-33	-	-	-	-
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	203-211, 242	-	-	-	-
	201-2 Financial implications and other risks and opportunities due to climate change	93-99	-	-	-	-
	201-3 Defined benefit plan obligations and other retirement plans	180	-	-	-	-
	201-4 Financial assistance received from government	204	-	-	-	-
Market presence						
GRI 3: Material Topics 2021	3-3 Management of material topics	165-167	-	-	-	-
GRI 202: Market Presence 2016	202-1 Ratios of standard entry level wage by gender compared to local minimum wage	178	-	-	-	-
	202-2 Proportion of senior management hired from the local community	-	x	Not applicable	The company has no the criteria required in the senior management selection. The Senior management selection is generally based on qualifications in experiences, expertise and competency, but not include location of residence.	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
Indirect economic impacts						
GRI 3: Material Topics 2021	3-3 Management of material topics	203-211	-	-	-	-
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	35-41, 206-211	-	-	-	-
	203-2 Significant indirect economic impacts	27-28	-	-	-	-
Procurement practices						
GRI 3: Material Topics 2021	3-3 Management of material topics	212-220, 224-225	-	-	-	-
GRI 204: Procurement Practices 2016	204-1 Proportion of spending on local suppliers	242	-	-	-	-
Anti-corruption						
GRI 3: Material Topics 2021	3-3 Management of material topics	78-80	-	-	-	-
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	80	-	-	-	-
	205-2 Communication and training about anti-corruption policies and procedures	80, 89-90	-	-	-	-
	205-3 Confirmed incidents of corruption and actions taken	84	-	-	-	-
Anti-competitive behavior						
GRI 3: Material Topics 2021	3-3 Management of material topics	76	-	-	-	-
GRI 206: Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	76	-	-	-	-
Tax						
GRI 3: Material Topics 2021	3-3 Management of material topics	204	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 207: Tax 2019	207-1 Approach to tax	204	-	-	-	-
	207-2 Tax governance, control, and risk management	204	-	-	-	-
	207-3 Stakeholder engagement and management of concerns related to tax	204	-	-	-	-
	207-4 Country-by-country reporting	-	x	Information incomplete	The data is currently sorted by subsidiaries with equity holding 50% and above. The data collection process is underway of improvement.	-
Materials						
GRI 3: Material Topics 2021	3-3 Management of material topics	115-118	-	-	-	-
GRI 301: Materials 2016	301-1 Materials used by weight or volume	119-125, 253	-	-	-	-
	301-2 Recycled input materials used	125	-	-	-	-
	301-3 Reclaimed products and their packaging materials	-	x	Not Applicable	The company's product is electricity which is in form of energy.	-
Energy						
GRI 3: Material Topics 2021	3-3 Management of material topics	115-120	-	-	-	-
GRI 302: Energy 2016	302-1 Energy consumption within the organization	119, 253	-	-	-	-
	302-2 Energy consumption outside of the organization	252	-	-	-	-
	302-3 Energy intensity	120, 253	-	-	-	-
	302-4 Reduction of energy consumption	120, 253	-	-	-	-
	302-5 Reductions in energy requirements of products and services	105-106, 252	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
Water and effluents						
GRI 3: Material Topics 2021	3-3 Management of material topics	115-118, 121-123	-	-	-	-
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	121-123, 254	-	-	-	-
	303-2 Management of water discharge-related impacts	123-125, 130-131, 255	-	-	-	-
	303-3 Water withdrawal	121-122, 254	-	-	-	-
	303-4 Water discharge	123-125, 130-131, 255	-	-	-	-
	303-5 Water consumption	122, 255	-	-	-	-
Biodiversity						
GRI 3: Material Topics 2021	3-3 Management of material topics	135-136	-	-	-	-
GRI 304: Biodiversity 2016	304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	137-140	-	-	-	-
	304-2 Significant impacts of activities, products and services on biodiversity	137-140	-	-	-	-
	304-3 Habitats protected or restored	140	-	-	-	-
	304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations	137-140	-	-	-	-
Emissions						
GRI 3: Material Topics 2021	3-3 Management of material topics	91-103, 127-128	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	104, 253-254	-	-	-	-
	305-2 Energy indirect (Scope 2) GHG emissions	104, 253-254	-	-	-	-
	305-3 Other indirect (Scope 3) GHG emissions	104, 253-254	-	-	-	-
	305-4 GHG emissions intensity	103, 254	-	-	-	-
	305-5 Reduction of GHG emissions	105-113	-	-	-	-
	305-6 Emissions of ozone-depleting substances (ODS)	-	x	Not Applicable	The electricity production does not directly emit Ozone substances and it is not a monitoring parameter required by law or EIA's requirement.	-
	305-7 Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	127-129, 254	-	-	-	-
Waste						
GRI 3: Material Topics 2021	3-3 Management of material topics	131-132	-	-	-	-
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	132-134	-	-	-	-
	306-2 Management of significant waste-related impacts	133-134	-	-	-	-
	306-3 Waste generated	133-134	-	-	-	-
	306-4 Waste diverted from disposal	133, 255-256	-	-	-	-
	306-5 Waste directed to disposal	133, 255-256	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
Supplier environmental assessment						
GRI 3: Material Topics 2021	3-3 Management of material topics	214-217	-	-	-	-
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	221-224	-	-	-	-
	308-2 Negative environmental impacts in the supply chain and actions taken	218-221	-	-	-	-
Employment						
GRI 3: Material Topics 2021	3-3 Management of material topics	165-167	-	-	-	-
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	178, 250	-	-	-	-
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	178-179	-	-	-	-
	401-3 Parental leave	250	-	-	-	-
Labor/management relations						
GRI 3: Material Topics 2021	3-3 Management of material topics	165-167	-	-	-	-
GRI 402: Labor/Management Relations 2016	402-1 Minimum notice periods regarding operational changes	177,184	-	-	-	-
Occupational health and safety						
GRI 3: Material Topics 2021	3-3 Management of material topics	142,149-156	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	149-156	-	-	-	-
	403-2 Hazard identification, risk assessment, and incident investigation	150-152	-	-	-	-
	403-3 Occupational health services	150-157	-	-	-	-
	403-4 Worker participation, consultation, and communication on occupational health and safety	149	-	-	-	-
GRI 403: Occupational Health and Safety 2018	403-5 Worker training on occupational health and safety	153-154, 157-158	-	-	-	-
	403-6 Promotion of worker health	155-158	-	-	-	-
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	149-160	-	-	-	-
	403-8 Workers covered by an occupational health and safety management system	149-160	-	-	-	-
	403-9 Work-related injuries	160, 245-247	-	-	-	-
	403-10 Work-related ill health	8, 160, 247	-	-	-	-
Training and education						
GRI 3: Material Topics 2021	3-3 Management of material topics	165-167, 170-171	-	-	-	-
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	172-174, 251-252	-	-	-	-
	404-2 Programs for upgrading employee skills and transition assistance programs	170-177	-	-	-	-
	404-3 Percentage of employees receiving regular performance and career development reviews	173, 252	-	-	-	-
Diversity and equal opportunity						
GRI 3: Material Topics 2021	3-3 Management of material topics	60-62	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	43, 60-62, 178	-	-	-	-
	405-2 Ratio of basic salary and remuneration of women to men	-	x	Confidentiality constraints	Based on the company's compensation structure, basic salary and remuneration are determined by job position. Men and women will get equal pay in the same position.	-
Non-discrimination						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143, 213-215	-	-	-	-
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	8, 143-146	-	-	-	-
Freedom of association and collective bargaining						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143, 215	-	-	-	-
GRI 407: Freedom of Association and Collective Bargaining 2016	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	144-146, 215, 218	-	-	-	-
Child labor						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143, 215	-	-	-	-
GRI 408: Child Labor 2016	408-1 Operations and suppliers at significant risk for incidents of child labor	144-146, 215, 218	-	-	-	-
Forced or compulsory labor						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143, 166-167, 215	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI 409: Forced or Compulsory Labor 2016	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	177, 182-183, 215, 218	-	-	-	-
Security practices						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143	-	-	-	-
GRI 410: Security Practices 2016	410-1 Security personnel trained in human rights policies or procedures	141-142	-	-	-	-
Rights of indigenous peoples						
GRI 3: Material Topics 2021	3-3 Management of material topics	141-143	-	-	-	-
GRI 411: Rights of Indigenous Peoples 2016	411-1 Incidents of violations involving rights of indigenous peoples	8, 141	-	-	-	-
Local communities						
GRI 3: Material Topics 2021	3-3 Management of material topics	187	-	-	-	-
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	188-203	-	-	-	-
	413-2 Operations with significant actual and potential negative impacts on local communities	28-29, 32	-	-	-	-
Supplier social assessment						
GRI 3: Material Topics 2021	3-3 Management of material topics	214-217	-	-	-	-
GRI 414: Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	221-224	-	-	-	-
	414-2 Negative social impacts in the supply chain and actions taken	218-221	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
Public policy						
GRI 3: Material Topics 2021	3-3 Management of material topics	77	-	-	-	-
GRI 415: Public Policy 2016	415-1 Political contributions	77	-	-	-	-
Customer health and safety						
GRI 3: Material Topics 2021	3-3 Management of material topics	-	x	Not applicable	Basically, our business model is B2B. The electricity, our main product, is transmitted through the power grid which is handled by the customer.	-
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	-	x	Not applicable		-
GRI 416: Customer Health and Safety 2016	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	-	x	Not applicable		-
Marketing and labeling						
GRI 3: Material Topics 2021	3-3 Management of material topics	-	x	Not applicable	Basically, our business model is B2B. The electricity, our main product, is transmitted through the power grid which is handled by the customer.	-
RI 417: Marketing and Labeling 2016	417-1 Requirements for product and service information and labeling	-	x	Not applicable		-
	417-2 Incidents of non-compliance concerning product and service information and labeling	-	x	Not applicable		-
	417-3 Incidents of non-compliance concerning marketing communications	-	x	Not applicable		-
Customer privacy						
GRI 3: Material Topics 2021	3-3 Management of material topics	228, 243	-	-	-	-
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	228, 237, 239-243	-	-	-	-

GRI Standard/ Other Source	Disclosure	Location	Omission			GRI Sector Standard Ref. No.
			Requirement (s) Omitted	Reason	Explanation	
GRI-G4 Electric Utilities Sector Disclosure						
EU 1	Installed capacity, broken down by primary energy source and by regulatory regime	35-38, 229-236	-	-	-	-
EU 2	Net energy output broken down by primary energy source and by regulatory regime	229-236	-	-	-	-
EU 3	Number of residential, industrial, institutional and commercial customer accounts	229-236	-	-	-	-
EU 5	Allocation of CO ₂ e emissions allowances or equivalent, broken down by carbon trading framework	101-114, 252	-	-	-	-
EU 10	Planned capacity against projected electricity demand over the long term, broken down by energy source and regulatory regime	5-6, 19	-	-	-	-
EU 11	Average generation efficiency of thermal plants by energy source and by regulatory regime	119-120, 238	-	-	-	-
EU 13	Biodiversity of offset habitats compared to the biodiversity of the affected areas	135-140	-	-	-	-
EU 15	Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category And by region	180	-	-	-	-
EU 17	Days worked by contractor and subcontractor employees involved in construction, operation & Maintenance activities	160, 243	-	-	-	-
EU 21	Disaster/ Emergency Planning and Response	94-97, 153-155, 163-166	-	-	-	-
EU 30	Average plant availability factor by energy source and by regulatory regime	238	-	-	-	-

Disclosure in the Alignment with TCFD



Section	Items	Disclosure Source
Governance	<ul style="list-style-type: none"> The organization governance around climate-related risks and opportunities 	<ul style="list-style-type: none"> Climate Change Adaptation Page 92-93 (The Governance on Climate Action) https://www.ratch.co.th/storage/download/social/climate-strategy/ratch-disclosure-tcf-d-en.pdf
Strategy	<ul style="list-style-type: none"> Climate analysis on physical risk, including RCP 2.6 and RCP 8.5 scenario, and transition risks in market, technology and regulations Climate -related impact and opportunity assessment on business strategy, targets, financial, operation, business partners and customers, health, safety and environment, regulatory compliance, and reputation. Mitigation and adaptation plan for climate-related risks and opportunities Climate Strategy development as a framework of decarbonization roadmap planning 	<ul style="list-style-type: none"> Climate Change Responses Page 99-100 Sustainability Strategy Page 17-20 Management of Significant Material Topics Page 30-32 Assessment of climate-related risks and opportunities Page 93-99 https://www.ratch.co.th/storage/download/social/climate-strategy/ratch-disclosure-tcf-d-en.pdf
Risk Management	<ul style="list-style-type: none"> Climate-related physical and transition risk identification, assessment, and management process. Climate-related opportunity assessment process. Impact assessment and mitigation and preventive measures for high risks factors. 	<ul style="list-style-type: none"> Risk Management and Internal Control Page 101 Assessment of climate-related risks and opportunities Page 93-99 https://www.ratch.co.th/storage/download/social/climate-strategy/ratch-disclosure-tcf-d-en.pdf
Metrics and Targets	<ul style="list-style-type: none"> Decarbonization roadmap planning Presents the scope 1, 2 and 3 emissions to date and the proposed target of those emissions moving forward. 	<ul style="list-style-type: none"> GHG Emission and target settings Page 103-104 Decarbonization roadmap planning Page 113 https://www.ratch.co.th/storage/download/social/climate-strategy/ratch-disclosure-tcf-d-en.pdf



LRQA Independent Assurance Statement

Relating to RATCH Group PCL.'s Sustainability Report for the calendar year 2022

This Assurance Statement has been prepared for RATCH Group PCL. (RATCH) in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

LRQA (Thailand) Limited (LRQA) was commissioned by RATCH Group PCL. (RATCH) to provide independent assurance on its Sustainability Report 2022 "the report" against the assurance criteria below to a moderate level of assurance and at the materiality of the professional judgement of the verifier using AA1000AS v3 the following principles of - inclusivity, materiality, responsiveness, impact and reliability of performance data be applied.

Our assurance engagement covered RATCH's subsidiaries in Thailand, Australia, Lao PDR and Singapore under its direct operational control only, and specifically the following requirements:

- Confirming that the report is in accordance with:
 - GRI Standards 2021
 - GRI Electricity & Utilities sector disclosures
- Evaluating the accuracy and reliability of data and information for only the selected indicators listed below: ¹
 - Environmental: *GRI 301-1 Materials used by weight or volume, GRI 302-1 Energy consumption within the organization, GRI 302-3 Energy intensity, GRI 302-4 Reduction of energy consumption, GRI 303-3 to 5 Water withdraw, discharge and consumption, GRI 305-1 Direct (scope 1) GHG emissions, GRI 305-2 Energy indirect (scope 2) GHG emissions, GRI 305-3 Other indirect (Scope3) GHG emissions – Cat. 1, 3 and 5 only, GRI 305-4 GHG emissions intensity, GRI 305-5 Reduction of GHG emissions, GRI 305-7 Nitrogen Oxide (NO_x), Sulphur Oxide (SO_x), and other significant air emissions, GRI 306-3 to 5 Waste generated, diverted from disposal and directed to disposal*
 - Social: *GRI 401-1 New employee hires and employee turnover, GRI 403-9 Work-related injuries and GRI 403-10 Work-related ill health, GRI 413-1: Operations with local community engagement, impact assessments, and development programs.*

Our assurance engagement excluded the data and information of RATCH's subsidiaries where it has no operational control and all its operations and activities outside of Thailand, Australia, Lao PDR and Indonesia. Our assurance engagement also excluded the data and information of its suppliers and any third-parties mentioned in the report.

LRQA's responsibility is only to RATCH. LRQA disclaims any liability or responsibility to others as explained in the end footnote. RATCH's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of RATCH.

LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that RATCH has not, in all material respects:

- Met the requirements above
- Disclosed accurate and reliable performance data and information as no errors or omissions were detected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

LRQA's approach

LRQA's assurance engagements are carried out in accordance with AA1000AS v3. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing RATCH's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this by interviewing RATCH's Management who engage directly with stakeholder groups as well as reviewing documents and associated records. Reviewing RATCH's process for identifying and determining material issues to confirm that the right issues were included in their report. We did this by benchmarking reports written by

¹ GHG quantification is subject to inherent uncertainty.



RATCH and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether RATCH makes informed business decisions that may create opportunities which contribute towards sustainable development.

- Auditing RATCH's data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling process, and systems, including those for internal verification. We also spoke with key people in various departments responsible for compiling the data and drafting the report.
- Visiting RATCH's operation units (SCG (Chonburi) Power Plant, NRER Power Plant in Thailand, Asia Water Company Limited and RATCH-Lao Services Company Limited in Lao PRD) to sample performance data and information for the selected specific standard disclosures to confirm its reliability.

Observations

Further observations and findings, made during the assurance engagement, are:

- **Stakeholder inclusivity:**
We are not aware of any key stakeholder groups that have been excluded from RATCH's stakeholder engagement process. RATCH has open dialogue with all of its stakeholders to understand their growing expectations.
- **Materiality:**
We are not aware of any material issues concerning RATCH's sustainability performance that have been excluded from the report. It should be noted that RATCH has established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the company's management.
- **Responsiveness:**
RATCH has addressed the concerns of stakeholders in climate changes mitigation. However, we believe that future reports should discuss progress in GHG emissions reduction plan as well as reporting of significant GHG Scope 3 emissions.
- **Impact:**
RATCH has addressed impacts valuation of human rights, socials, OH&S and climate change related.
- **Reliability:**
Data management systems consider to be well defined. RATCH should consider interim verification to further improve the reliability and timeliness of its disclosed data and information.

LRQA's standards, competence and independence

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification together with TGO CFO (Carbon Footprint for organization Scheme of Thailand Greenhouse Gas Management Organization (Public Organization)) are the only works undertaken by LRQA for RATCH and as such does not compromise our independence or impartiality.

Dated: 15 March 2023

Opart Charuratana
LRQA Lead Verifier

On behalf of LRQA (Thailand) Ltd.
No.9, G Tower Grand Rama 9, FL. 30, Room H14,
Rama 9 Rd., HuayKwang, Bangkok, 10310, THAILAND

LRQA reference: BGK00000854

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Feedback Form: 2022 Sustainability Report

RATCH Group PCL.



Scan QR Code
for feedback

1. Please identify your stakeholder type
 - Shareholder/Investor Customer/Service User Partner/Supplier
 - Employee Regulatory Institution Scholar/Independent Organization
 - Community Media Other (Please specify)

2. Where do you receive this Sustainability Report?
 - Annual General Meeting Company's website Other (Please specify)

3. Why do you prefer reading this Sustainability Report?
 - For support investment decision on RATCH's securities Research and educational purposes
 - For learning more about RATCH's business Other (Please specify)

4. Satisfactory level towards the 2022 Sustainability Report

• Attractive topics	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Information adequacy	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Reliable information	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Presentation methods	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Readability	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Design	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable
• Overall satisfaction	<input type="radio"/> Very Good	<input type="radio"/> Good	<input type="radio"/> Acceptable

5. Are you confident that operational approaches described in the Report will enable RATCH's sustainable growth?
 - Yes, because
 - No, because
 - Probably, because.....

6. What dimension you would like RATCH to disclose more information in the next issue?
(You can choose more than 1 choice)
 - Economic and Governance (Please specify topic)
 - Environment (Please specify topic)
 - Society (Please specify topic)
 - Information adequacy

7. In your opinion, what aspects RATCH should keep focus and continuous improvement?
 - Economic and Governance (Please specify topic)
 - Environment (Please specify topic)
 - Society (Please specify topic)

8. Your suggestion for further improvement of the Report
 - Content Readability Design
 - Other (Please specify)

Thank you for your valuable feedback
which will be useful for improvement of next issue of the report.



RATCH Group Public Company Limited

72 Ngam Wong Wan Road, Bang Khen, Muang Nonthaburi, Nonthaburi 11000 Thailand

Tel : 0 2794 9999

Fax : 0 2794 9998

Website : www.ratch.co.th

For more information about this

Contact : Corporate Sustainability Development Division

Tel : 0 2794 9951-5

Fax : 0 2794 9888 ext. 9951-5

Email : sustainability@ratch.co.th