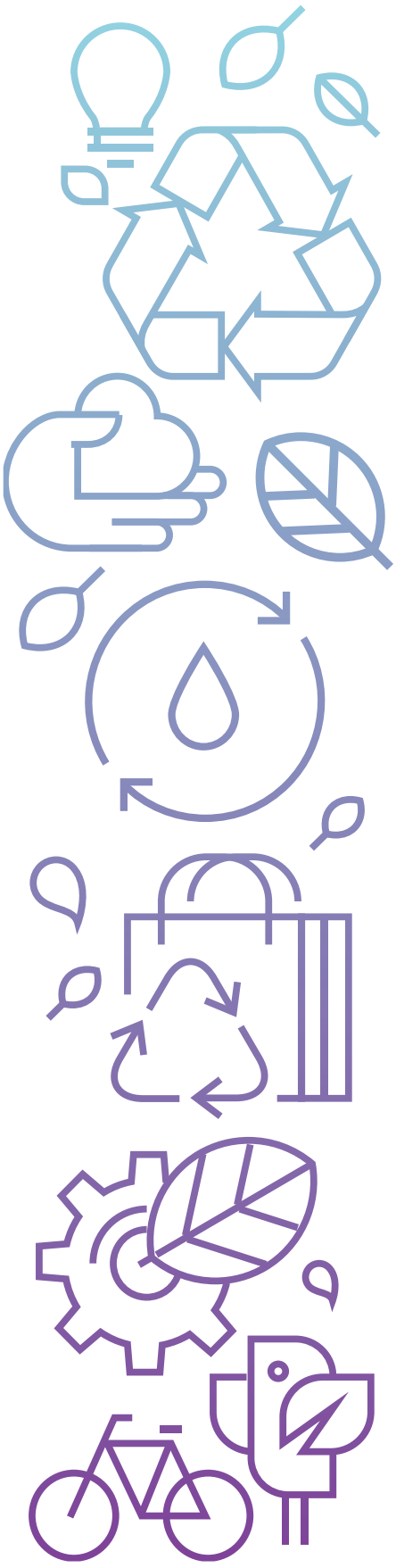
PEA
PROVINCIAL ELECTRICITY AUTHORITY
Brightness for Life Quality

SHIFTING TO DIGITAL UTILITY FOR SUSTAINABLE SOCIETY

Sustainability Report
2021
Provincial Electricity Authority



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Sustainability Report

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Sustainability Report 2021
Provincial Electricity Authority
“Drive socioeconomic by Electric Energy
through a digital service platform”
“Upgrade quality of life for sustainable living for all,
stepping forward to becoming a leading organization
that provides the integrated service of Electric Energy”
“Innovate and drive the energy solutions
toward becoming the Digital Utility”
PEA
E-SERVICE

PEA

PROVINCIAL ELECTRICITY AUTHORITY

SHIFTING TO DIGITAL UTILITY FOR SUSTAINABLE SOCIETY

Sustainability Report 2021

Provincial Electricity Authority

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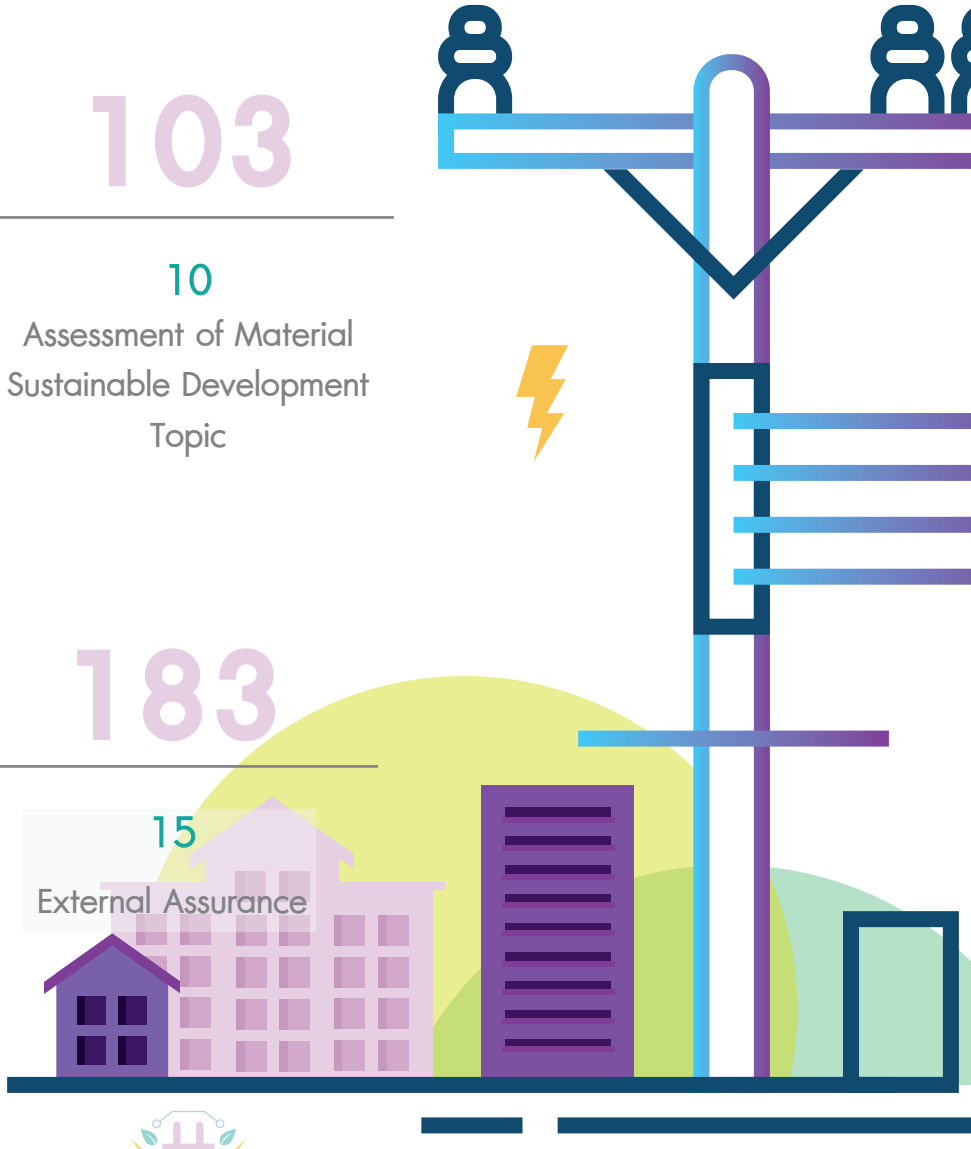


01

MESSAGE FROM THE GOVERNOR OF THE PROVINCIAL ELECTRICITY AUTHORITY (2-22)

> "Grow with Partners, Continue the Mission, Driven by Technology"

More than 61 years, Provincial Electricity Authority (PEA) has efficiently provided electricity services and related businesses to sustainably improve quality of life and economy for Thai society. PEA has developed the modern electricity network and management system to improve the quality of life and provide equal access to electricity for people in all regions.

In 2021, the economic crisis and the pandemic of Coronavirus 2019 (COVID-19) led to the change in many dimensions including new lifestyle (New Normal), customer behavior and rapid growth of technology. It is a great challenge for PEA in applying digital technology to maximize the efficiency of energy management as preparation for the transition to a digital society (Digital Utility). To overcome the challenge, PEA has "P E A Policy" which includes 3 approaches and 9 strategies (3P 3E 3A) :

P (People, Partner, Profit) Grow with partners: human capital development, creating a sense of ownership (People), seeking partners to create value for the organization and society (Partner), choosing the right investment, planning sustainable future financial (Profit)

E (Experience Enhancement Ecosystem) Continue the mission: enhancing customer experience, focusing on digital services (Experience), increasing efficiency of assets management in the electricity distribution system (Enhancement), good corporate governance, creating value for society and sustainable growth with PEA's business ecosystem (Ecosystem).

A (Agile Adopt Alignment) Driven by technology: building flexible organization (Agile), applying digital technology and innovation (Adopt), setting direction for working together, aiming for the success of the organization (Alignment).

In the past year, PEA created alliances and partners in energy business operations such as production system, distribution system, maintenance system and safety standards for electrical system. PEA also upgraded power distribution systems by focusing on automation with grid modernization, accelerated the expansion of electrical systems, including electricity generated by renewable energy, for agricultural sector and unelectrified households to deliver good quality of life for people. Digital technology has been applied in order to respond the needs of customers. In addition, organization restructuring and cross functional team working process, innovation and knowledge management, and human resource development have also been focused to improve performance of PEA.

As a result, PEA achieved the indicator 7.1.1 Proportion of Population with Access to Electricity of Sustainable Development Goals (SDGs). Thailand has the target of population with access to electricity at 99 percent by the year 2025 and PEA is currently distributing electricity to 21,147,438 households which is accounted for 99.72 percent of the total 21,206,917 households in PEA's responsible areas. Therefore, PEA is recognized domestically and internationally evidenced with awards of pride such as Asia Responsible Enterprise Awards 2021 in the topic of "Towards the Renewable and Sustainable Energy Community"; 8 rewards of invention and innovation contest from "The 48th International Exhibition of Inventions Geneva" including 1 Honorable Gold Medal, 5 Gold Medals and 2 Silver Medals; and 6 awards of Outstanding State Enterprise Award of the year 2021 including Outstanding Organization Leader Award, Development to Digital State Enterprise Award, Outstanding Service Award, Outstanding Corporate Social and Environmental Responsibility Award, Outstanding Creativity and Innovation Award, and Outstanding Disclosure and Transparency Award. Furthermore, 68 offices of PEA received the national G-Green verification in the year 2021.

PEA would like to thank all stakeholders for the trust and support its business operations. PEA reaffirms its determination to provide efficient electricity services and related businesses. As a leader in the energy business, PEA will be a vital source of economic, social and environmental development to grow and create value for Thai society. PEA plans to install 263 stations of PEA VOLTA, quick charging stations for electric vehicles, along the main roads and tourist attractions in 75 provinces by the year 2023. Long-term projects focusing of the development of Environment, Social and Governance (ESG) will also be developed to create fund raising options in terms of Sustainability-linked Bond (ESG Bond).

"Grow with partners, Continue the mission, Driven by technology"

(Mr. Supachai Ek-Un)
Governor of Provincial Electricity Authority

OUTSTANDING PERFORMANCE IN 2021

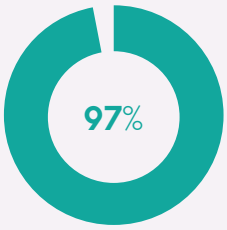
Economic Dimension

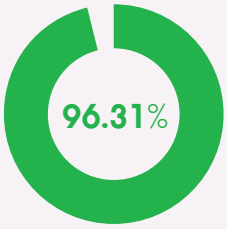
- Total Number of SAIFI is **2.19**
- Total Number of SAIDI is **44.51**
- Total Loss in Distribution System is **5.45**

13,095 employees

47%

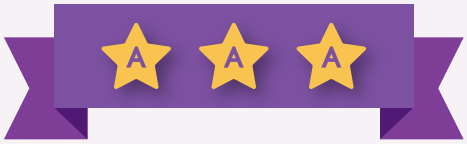
- 13,095 employees, which was accounted for 47% of the total employees, attended the information security awareness course.





- 97.00% and 96.31% of employees attended and passed Data Governance Course and Personal Data Protection Course, respectively.

- No complaint on customer privacy violation in 2021. (418-1)
- No customer personal information leaked or no breach of the customer's personal data. (418-1)
- No breach or non-compliance with laws and regulations. (2-27)
- Developed Information Security Management System and received ISO/IEC 27001 certification covering all infrastructure for 12 regions.
- Internal operations of the information security management system were audited by the Internal Audit and certified body on a yearly basis.
- Developed Cyber Threat Response Plan, National Incident Response Plan and Incident Response Fundamental.
- No cyber threat, that has great impact on PEA, occurred in 2021.



- Obtained corporate credit rating at "AAA" level for the 4th consecutive year.

- Return On Asset (ROA) was 2.98. **2.98**
- Net Profit Margin was 2.90. **2.90**
- Current Ratio was 1.46. **1.46**

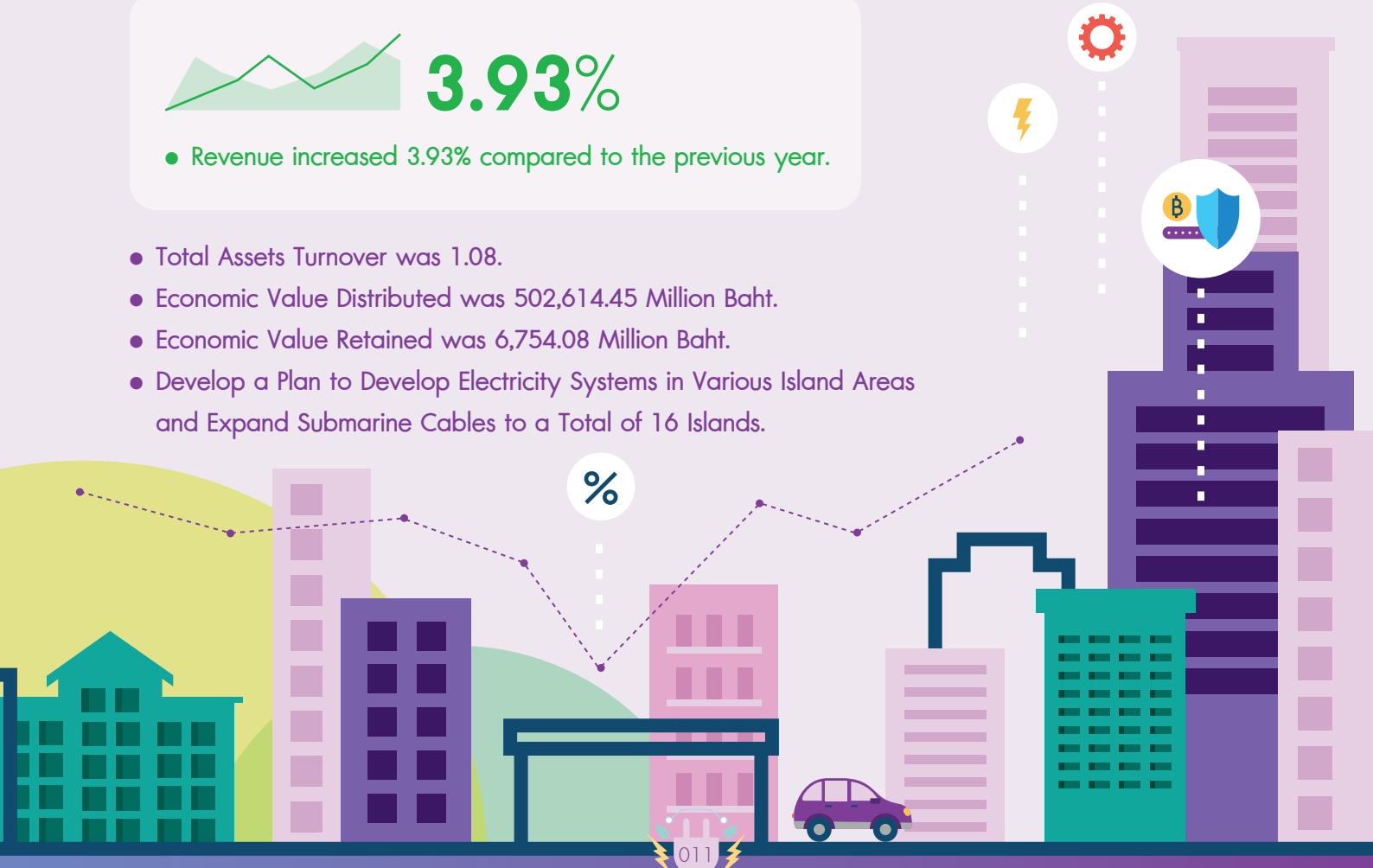
509,368.53 million baht

- Total Revenue (201-1) was 509,368.53 Million Baht.

3.93%

- Revenue increased 3.93% compared to the previous year.

- Total Assets Turnover was 1.08.
- Economic Value Distributed was 502,614.45 Million Baht.
- Economic Value Retained was 6,754.08 Million Baht.
- Develop a Plan to Develop Electricity Systems in Various Island Areas and Expand Submarine Cables to a Total of 16 Islands.



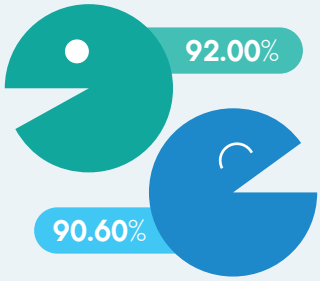
Social Dimension

- Member under the care of the Labor Unity of PEA was accountable for 100% of employee. (2-30)

- None of unfair personnel recruitment and selection nor discrimination was detected. (406-1)

- The level of satisfaction in the personnel recruitment and selection process of new employee was 4.61.

- The average of employee commitment was 4.60.



- The average of employee well-being was 4.53.

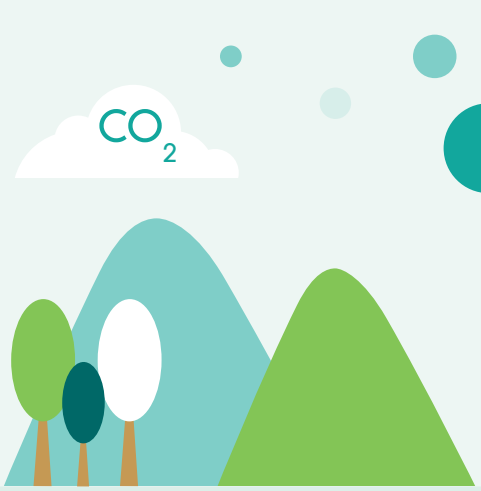
- The level of employee sense of belonging was 4.60.
- The willingness to do the best for work was 4.68.
- The employee turnover rate accounted for 0.11% with a decrease from 0.02%.
- The worker turnover rate was 14.97% with an increase from 11.63%.
- Employees with disabilities were 0.80% of all employees.

- The success of safety and occupational health operation was rated at 100% at level 5.

- Total number of households was accessible to electrical system 21,147,438 households as a 99.72%.

- TIS 18001 standard has been certified for the 12 additional PEA offices.
- The success of safety and occupational health operation was rated at 100% at level 5.
- The Disabling Injury Index ($\sqrt{DI}$) was at 0.1663 at level 1.
- Occupational health and safety training to employees and workers of PEA was 0.766%. (403-5)
- Electrification was completed for 102,186 new rural households.
- Electrification was done in agricultural area for 4,853 persons.

Environment Dimension

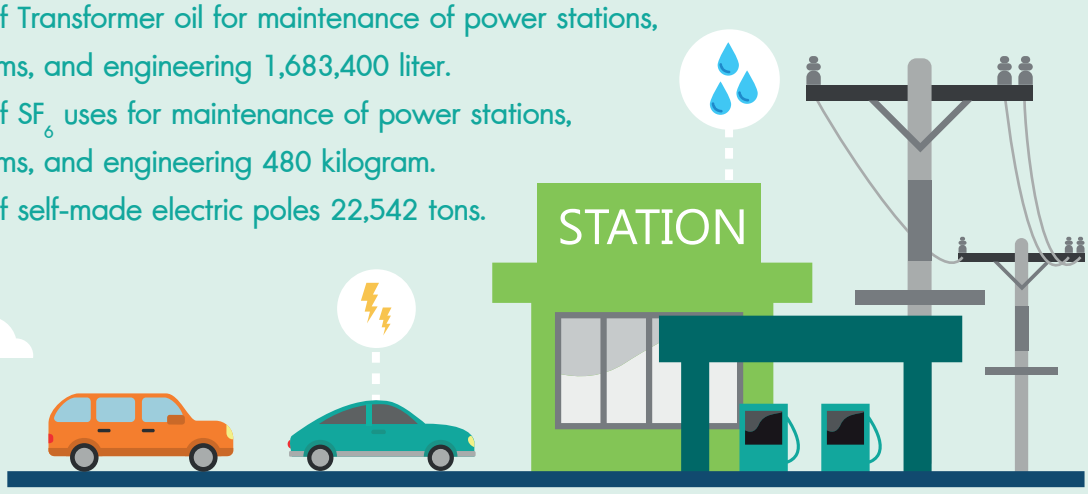


CO_2

236,079.11 tCO_2e

- Total number of greenhouse gas emissions from all major activities 236,079.11 tCO_2e.

- Total number of uses Diesel fuel for electricity generation 8,122,485.33 liter.
- Total number of uses Diesel fuel for vehicle consumption 19,780,029 liter.
- Total number of Transformer oil for maintenance of power stations, electrical systems, and engineering 1,683,400 liter.
- Total number of SF_6 uses for maintenance of power stations, electrical systems, and engineering 480 kilogram.
- Total number of self-made electric poles 22,542 tons.



- Total number of uses A4 paper 132,538 reams.
- Total number of uses Thermal paper 6,351,278 piece.
- Total number of tap water 1,580,738 cubic meter.
- Total number of office electricity 142,813.195 kWh.
- Total number of refrigerant leakage (R-12, R-410A, R-134a and R-32) 956.76 kilogram.

Awards of Pride

1.

PEA received the ITA score of 2021, the best score in eight years

PEA achieved the certificate of honor, ITA Awards 2021, where the Integrity and Transparency Assessment (ITA) of the year 2021 gave scores of 98.34 at AA level (increasing from 2020 of 95.24 scores). It represents the best score in eight years since participating in the assessment in 2014 and was given the 1st prize by the Ministry of Interior as well as won the 1st prize of the State Enterprise in Energy and 6th prize in the total assessed of State Enterprises.

2.

PEA received the acknowledged certification in the Information Technology Management System complying with the ISO/ IEC 38500: 2015 standard.

Mr. Supachai Ek-Un, the PEA's Governor, received the certification in Information Technology Management System (IT), in accordance with the ISO/ IEC 38500: 2015 standard to elevate the management standards to the international level leading to the sustainability. Furthermore, PEA implementation of the IT management following the international standards leads to the systems integrated management and proper risk management related to the IT.

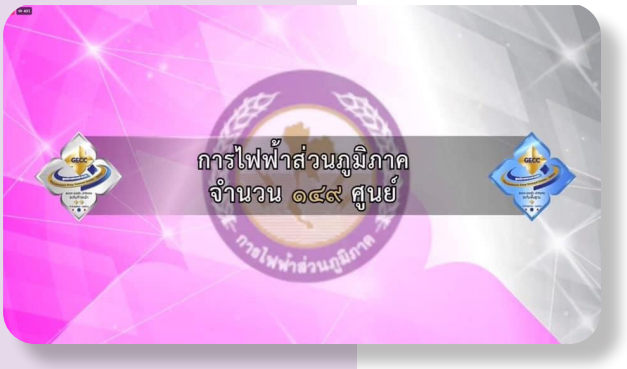
3.

PEA won the 1st prize of the public sector in 2021, the award of public sector's service at a good level, the types of the project's service development of 1 Tumbon 1 Electrician Project and raising the service facilitation.

4.

PEA gained the award of the Government Easy Contact Center (GECC) for the year 2021, with 149 offices

Mr. Anucha Nakasai, Minister Attached to the Prime Minister's Office, was the president in the award plaque consigning ceremony of GECC for the year 2021. For the year, 149 offices were certified and received the awards comprising 37 offices at progressing level and 112 offices at a fundamental level.



5.

PEA won the award at the Thailand Research Expo 2021

Mr. Wichian Punyawanich-gul, the PEA Deputy Governor, received the award plaque and certification of the Thailand Research Expo 2021 under the "Research for a national development to Stability, Prosperity, and Sustainability" concept through 2 accomplishments consisting of 1) PEA Solar Move phototype system, 2) PEA High Efficiency Power Pack.

6.

PEA won the winning award for the Best Store Competition of the Red Cross Online 2021

PEA won the winning award for the State Enterprise and the Independent Organization in the Best Store Competition of the Red Cross Online 2021 under “Pleasant Experience Delighting All Dimensions,” bonding to the slogan “Bright Light Providing Good Quality of Life”.

7.

PEA won the honorary Sustainability Disclosure Award

Mr. Udomsak Temwong, the PEA Deputy Governor, received the Sustainability Disclosure Award from the PEA Sustainability Report of the year 2020 by the Sustainability Disclosure Community hosted by the Thaipat Institute.

8.

PEA received the award plaque and certification Coordination Committee to support the senate education funding project

Mr. Udomsak Temwong, the PEA Deputy Governor, received the award plaque for the organization supporting the Coordination Committee for the senate education funding project. It aims to encourage students and youth in the project to comprehend the congress’s roles, responsibilities, and authority, as well as encourage them to be involved in Constitutional monarchy politics.

9.

PEA earned the national G-Green Awards of the year 2021

PEA obtained a green office status certified by the Department of Environmental Quality Promotion (DEQP) for 68 offices consisting of 66 offices (including buildings 50 and 51) for “excellence” (G - Gold level) and 2 offices for “very good” (G- Silver level) for PEA Saraburi Province and PEA Narathiwat Province), which are equivalent to greenhouse gas emissions at 4,126 tCO_2e.

10.

PEA obtained the Outstanding State Enterprise Award in 2021

In the Outstanding State Enterprise Award 2021, hosted by the State Enterprise Policy Office (SEPO), PEA received 6 awards as follows:

- Award for Outstanding the Organization Leader.
- Award for Outstanding Disclosure and Transparency.
- Award for Development to Digital State Enterprise.
- Award for Outstanding Corporate Social and Environmental Responsibility.
- Award for Outstanding Creativity and Innovation.
- Award for Outstanding Service (2 consecutive years).

Awards received in 2021 (International Level)

1.

PEA won the campaign of the year from the international stage, "MMA SMARTIES 2020," by the campaign #SAFEINTHERAIN

Mr. Panumart Limsuwan, the PEA Deputy Governor, received the campaign of the year award from the "MMA SMARTIES 2020". Miss Sirinith Viriyasisri, the Head of Business Marketing, TikTok, the digital marketing of 2020 to award under the campaign #SAFEINTHERAIN" on the TikTok platform with 133.8 million views in Southeast Asia.

2.

PEA won the winning award for ASIA RESPONSIBLE ENTERPRISE AWARDS (AREA) 2021 (3 consecutive years).

PEA won the award for ASIA RESPONSIBLE ENTERPRISE AWARDS (AREA) 2021 (3 consecutive years) from the Towards the Renewable and Sustainable Energy Community Project.

3.

PEA earned 5 innovation awards from the international stage ITEX 2021 at Kuala Lumpur, Malaysia.

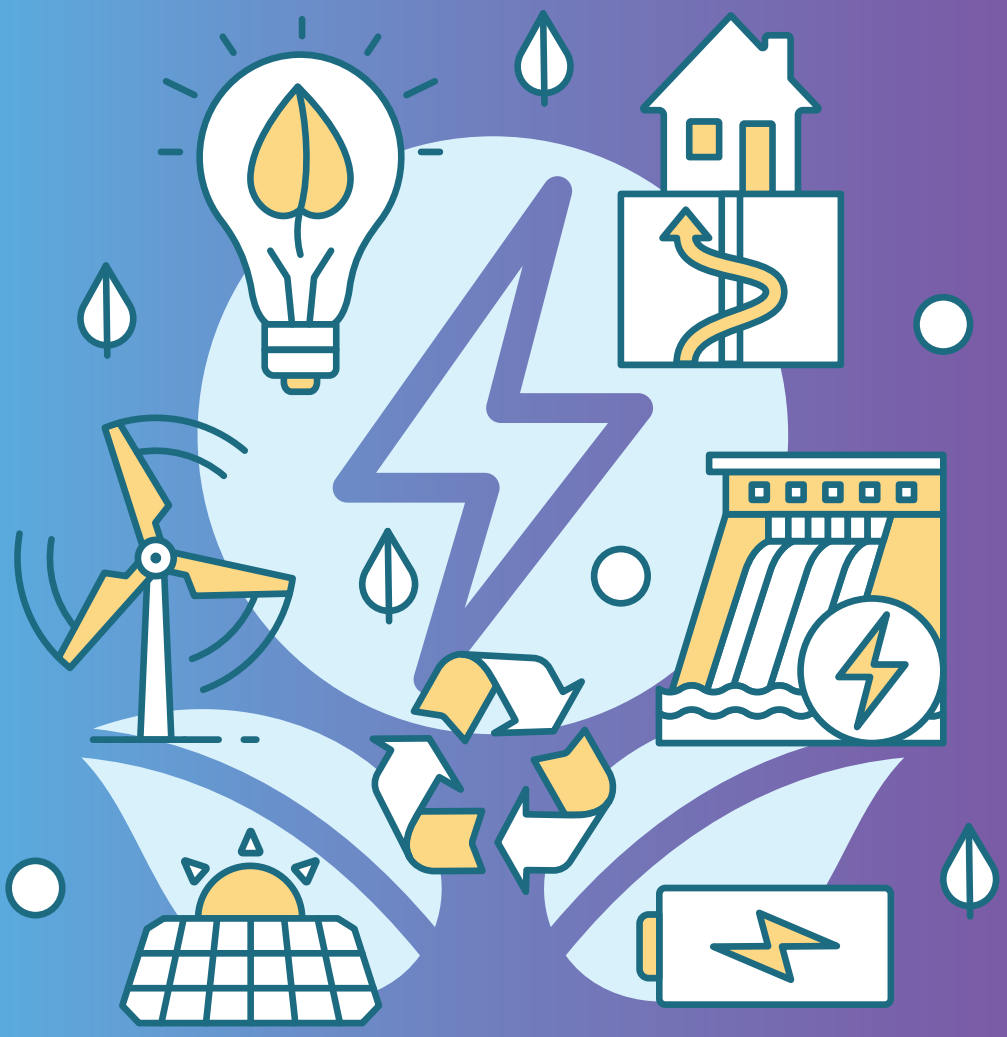
PEA earned 5 innovation awards from the international competition "The 32nd International Invention Innovation & Technology Exhibition" (ITEX 2021), consisting of:

1) Gold medal for the achievement of communication equipment transformation "RS232 serial communication" to wireless communication by radio technology.
2) Gold medal for the achievement of the Density Switch and Pressure Gauge Tester Kit.
3) Gold medal for the achievement of the PEA Communication Network Test Tool
4) Gold medal for the achievement of PEA Comealong.
5) Silver medal for the achievement of the Power Flow calculator program and the simulation of electric data system problem resolving in the form of Online Power System Analysis "OPSA".

4.

The invention research and innovation competition at "The 48th International Exhibition of Inventions Geneva"

PEA received the invention research and innovation award at the 48th International Exhibition of Inventions Geneva, Switzerland, in an online competition from 10-14 March 2021; comprised of 1 honor gold medal, 5 gold medals, and 2 silver medals.



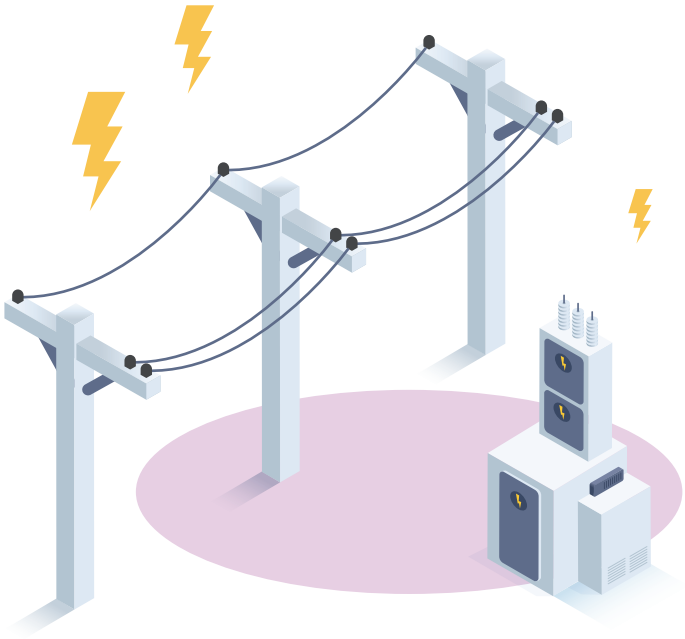
04

PEA'S BUSINESS

Provincial Electricity Authority [2-1] or PEA officially started its operation on 6 March 1954 and was designated as Provincial Electricity Organization. On 28 September 1960, Provincial Electricity Organization was transformed into Provincial Electricity Authority (PEA) and undertook the tasks of providing electric power service, machinists, machines and people to continue developing the undeveloped area. In the sixth decade of its operation, PEA reorganized the organizational structure and strategies in operation melodiously with the current situation to focus on the efficient power distribution service together with continually developing the organization in terms of quality and service. PEA moves forward and continues to be the champion of the energy business to respond to customers' expectations, creating social value and an environment with digital technology to drive the organization to PEA Digital Utility.

Today, PEA is a government enterprise under the Ministry of Interior and with the oversight of the State Enterprise Policy Office or SEPO. PEA primarily provides and distributes service to the electricity users in provincial parts, including the relevant business to service and support the PEA's customers such as construction work for users, inspection, repair, and maintenance work. PEA also focuses on a new business to further utilize assets or existing knowledge and capability for growing or potential in business growth in the future. PEA provides reliable electric power service and is sufficient for the demand of the electricity users as well as people in remote areas without electricity supply. PEA has planned a project to extend the boundary of the distribution system, construct better electricity system, and develop an in-service system; these affect stakeholders in all sectors and involving society and the environment too. Thus, PEA operates to meet the organization's mission and the government's policies.

History of the PEA's operation



1884 - 1970

Beginning – 1st decade

PEA was founded following the Provincial Electricity Authority Act 1960 on 28 September 1960. It has succeeded the Provincial Electricity Organization and continually with an actual capital of 87 million Baht. PEA was responsible for 200 branches,the total of 37,377 residential utility customers (households), and 2,119 employees. The maximum power comsumption in 1960 was merely 15,000 Kilowatts and produced by a power generator driven by a diesel engine which the power needs of a house is up to 26.4 million Kilowatt-hour (kWh) per year. People benefited from the electricity consumption of approximately 1 million or 5% of the total Thai citizen, 23 million people at that time.

1971 - 1980

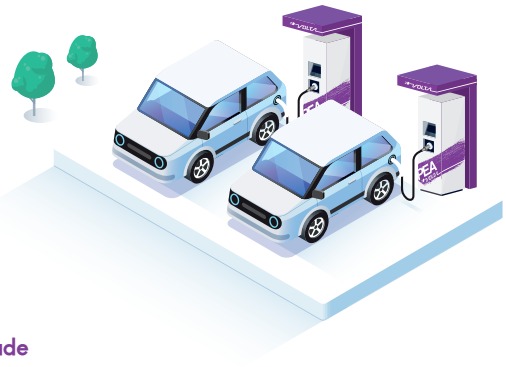
2nd decade

Entering the 12th year of PEA founding (1971-1980), the accumulated potential of readiness in development since the first decade, plus the beginning of The National Economic and Social Development Plan, the third plan (1972-1976), and the impulsion of all time increasing demand in electricity consumption of people up to 30% per year. The high demand affected PEA's plan revision to be ready for electricity development in rural areas and to meet the need of people.

1981 - 1990

3rd decade

Electricity played a significant role in every progress of the country since electricity was one of the fundamental structures in all activities. It was also continually produced and supported economic and social development. Therefore, the amount of electricity consumption in the country was directly related to the gross product expansion quantity, the national income, and the country's economic growth.



4th decade

The PEA's operation had been successful for 30 years and expanded the areas of the electric distribution systems to people in all responsible areas. This operation propped the electricity service in the industrial business, which moved the investment from urban extending to the countryside. It also led to other services' access to people and growth expansion.

7th decade

PEA operates primarily in business of providing and distributing electricity to users in regional electricity, including related businesses in terms of the supplementary business to service and support the PEA's customers such as construction work for users, inspection, repair, maintenance work etc. Besides, the new business from the utilization of assets or knowledge to expand growth or potential business in the future too.

1991 - 2000

Present

2001 - 2010

5th decade

PEA recognized the importance of servicing to pleasure the customers and enhanced operation efficiency, including adjusting to an up-to-date management approach, flexible and promptly. The alteration led to the ability in business competition and build trust for investors in business decisions.

2011 - 2020

6th decade

PEA enhanced the operation's organizational structure to accord with the current situation, aiming for electricity efficiency and continually developing the organization in both quality and service. PEA moved forward to be excellent in the electricity business, responding to customers' expectations and value creation of social and environment by digital technology to drive the organization to PEA Digital Utility.

Vision, Mission, and Core Values

Due to the changes in the electricity industry, PEA revised the organization's strategies by developing PEA's strategic plan for the year 2021 – 2025 to specify the operating direction of the organization to be ready to cope with changes together with continue growing the business, managing financial policy prudently, and pacing to the utility service provider of the new era with advance digital technology. PEA has also developed an excellent electric service system and as one of the country's drivers to build a stable and sustainable future and prepare for transformation the Era of The Digital Utility by 2022.

Vision

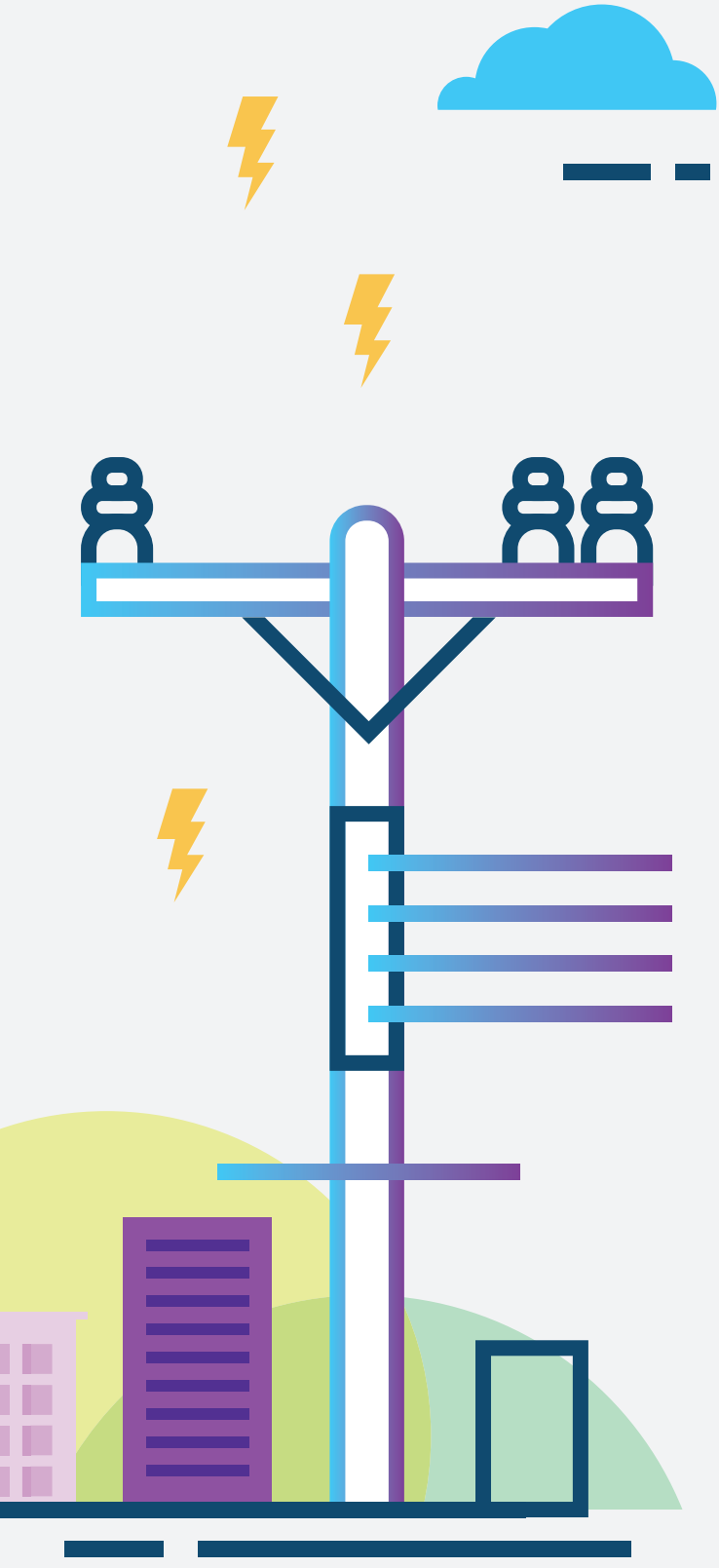
PEA is the modern leading organization in the region aiming to provide electricity service and related businesses ultimately which are efficient and trustworthy to develop the quality of life, economic, and social sustainably.

Mission

Provide and service the electricity and operate the related businesses to meet the customers' demands leading to customers' satisfaction in quality and service. PEA has been continually developed the organization and is responsible for social and the environment.

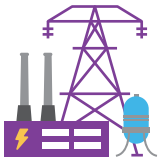
Core Values

"Modernization, Excellent Service, Good Governance"



Businesses and Services of PEA[2-6]

The fundamental of PEA's operation is providing business and electricity distributing services to the users in the regions, 74 provinces of Thailand except for Bangkok, Nonthaburi, and Samutprakarn. PEA receives the electric power from power producer network systems such as the Electricity Generating Authority of Thailand (EGAT) and Very Small Power Producer (VSPP); and distribute to the electricity users including large-scale users (large size industries, hotels, and department stores) and medium-scale industry as well as distribution to small power users in residential areas, divided into four regional agencies: North, Northeast, Central, and South regions. Besides, PEA provides the entire service in electrical engineering, starting from giving counsel, planning, designing, constructing, installing, and electric system maintenance by professional teams and advanced tools. The determination to provide quality, trustworthy, and efficient services, is to meet the needs and maximize customer satisfaction.



Power Procurement and Distribution Business

- PEA is the business receiving power supply from the power producer network systems and distributing to each type of electricity user through four regional agencies: North, Northeast, Central, and South regions.

Power Service Supportive Business

- **Related Business:**
  Related Business is power servicing business both in Supplementary and New Businesses, which can be under Regulated Business or Non-Regulated Business to lead the businesses' growth and maximize the levels of compensation from operation in the suitable level of PEA.

- **Supplementary Business:**
  It is a business to service and support PEA's customers or facilitate the power service operation for inbound and outbound. PEA furthers the Business from latency development in natural resources, specialization, and enhancing capability of various PEA's fields such as construction work for users, inspection, repair, maintenance work etc.

- **New Business:**
  It is related to the power service, which is further from utilizing benefits of assets or knowledge, existing capability to be growth (Adjacent Business) or the potential growth business in the future (New S-Curve) both inbound and outbound. PEA develops or cooperates with the government or private alliances to support altering the electricity industry's changed structure and add value to PEA's portfolio and subsidiaries.

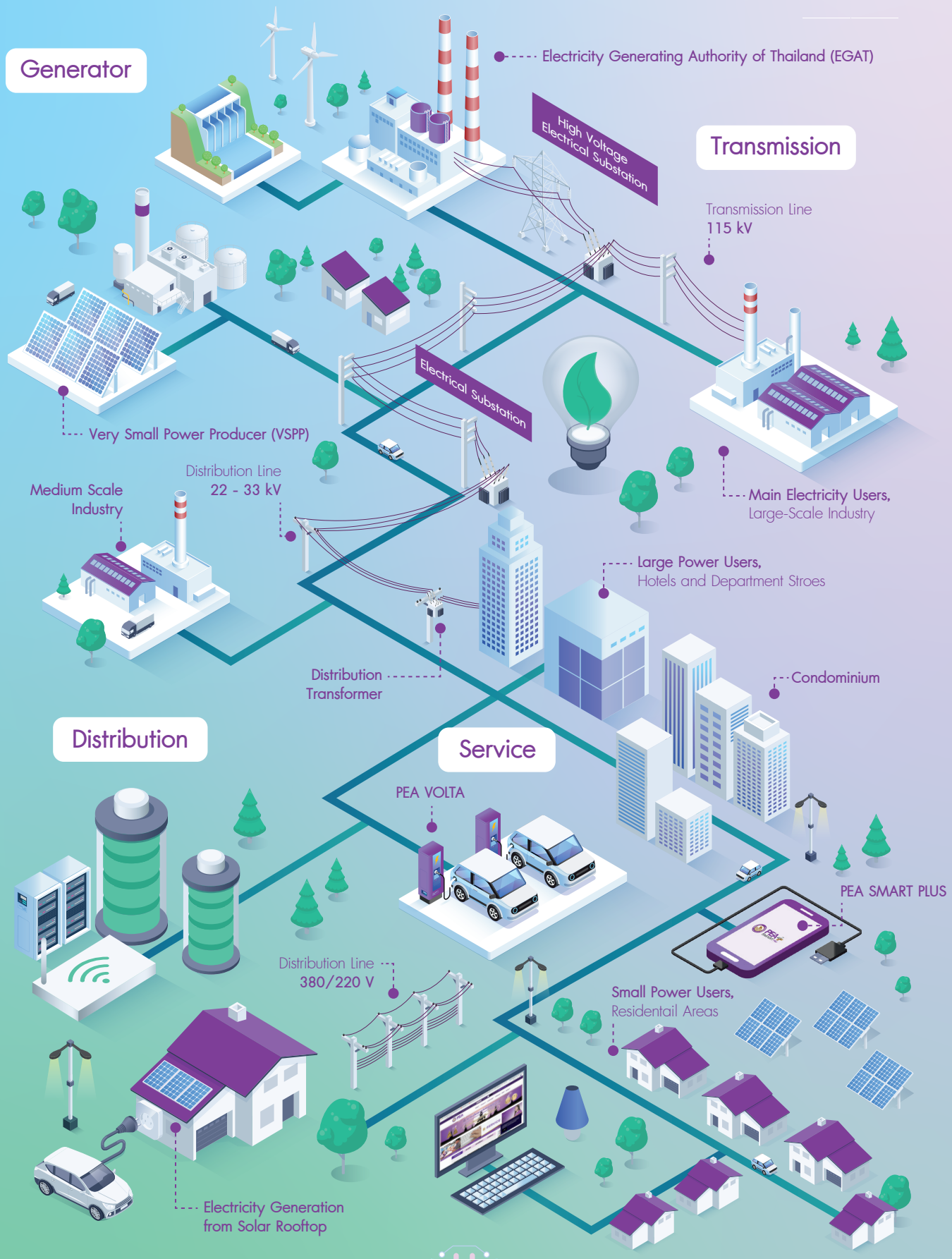
Power Trading Management Business

- It is the business in which PEA applies its specialization in power distribution systems to operate the Power Trading Management Business and provide service in the power trading channel. PEA also develops and monitors electricity system bonding with Power Production Source, Prosumer, and Energy Storage in each specific area as well as manages the power to balance and efficient under the reasonable cost.

Power Business Investment by Subsidiary (2-2)

- To expand the growth of PEA's businesses, it needs to adapt to support all transformation in the electricity business, including its role in creating business opportunities in terms of investment in the renewable energy business or joint investment in other companies. With the expansion, PEA operates through the PEA ENCOM International Co., Ltd. and any subsidiaries in the future, which play roles as a key investor and joint investor with the business alliances of PEA together with supporting the country's renewable energy.
- PEA ENCOM International Co., Ltd, or PEA ENCOM, is the first subsidiary of PEA, originated as a government enterprise. It was established according to the cabinet resolution on 3 June 2009 to operate in business in electricity investment and conduct training about electricity systems to the government and private sectors, both inbound and outbound. PEA is the complete shareholder; registered capital stocks started at 100,000,000 baht. Presently, the registered capital stocks are 3,795,283,750 baht.

Value Chain of PEA's Business (2-6)



Overall Work System of PEA (According to the Value Chain) (2-6)

Operating system	Management	Action
1. Strategic Regulatory and Risk Management in Business	S1 Strategic Management	S1.1 Strategic Planning
		S1.2 Performance Management
		S1.3 Organization Development and Change Management
	S2 Governance, Risk Management, and Law, Rules, Regulations Compliance	S2.1 Good Governance Process
		S2.2 EA Governance
		S2.3 Digital Governance
		S2.4 Data Governance
		S2.5 Risk Management
		S2.6 Compliance Process
		S2.7 Internal Control
		S2.8 Business Continuity Management
		S2.9 Compliance Management
		S2.10 Internal Audit
	S3 Sustainability Management of the Organization	S3.1 Sustainability Management
		S3.2 Stakeholder Management
		S3.3 Corporate Social Responsibility

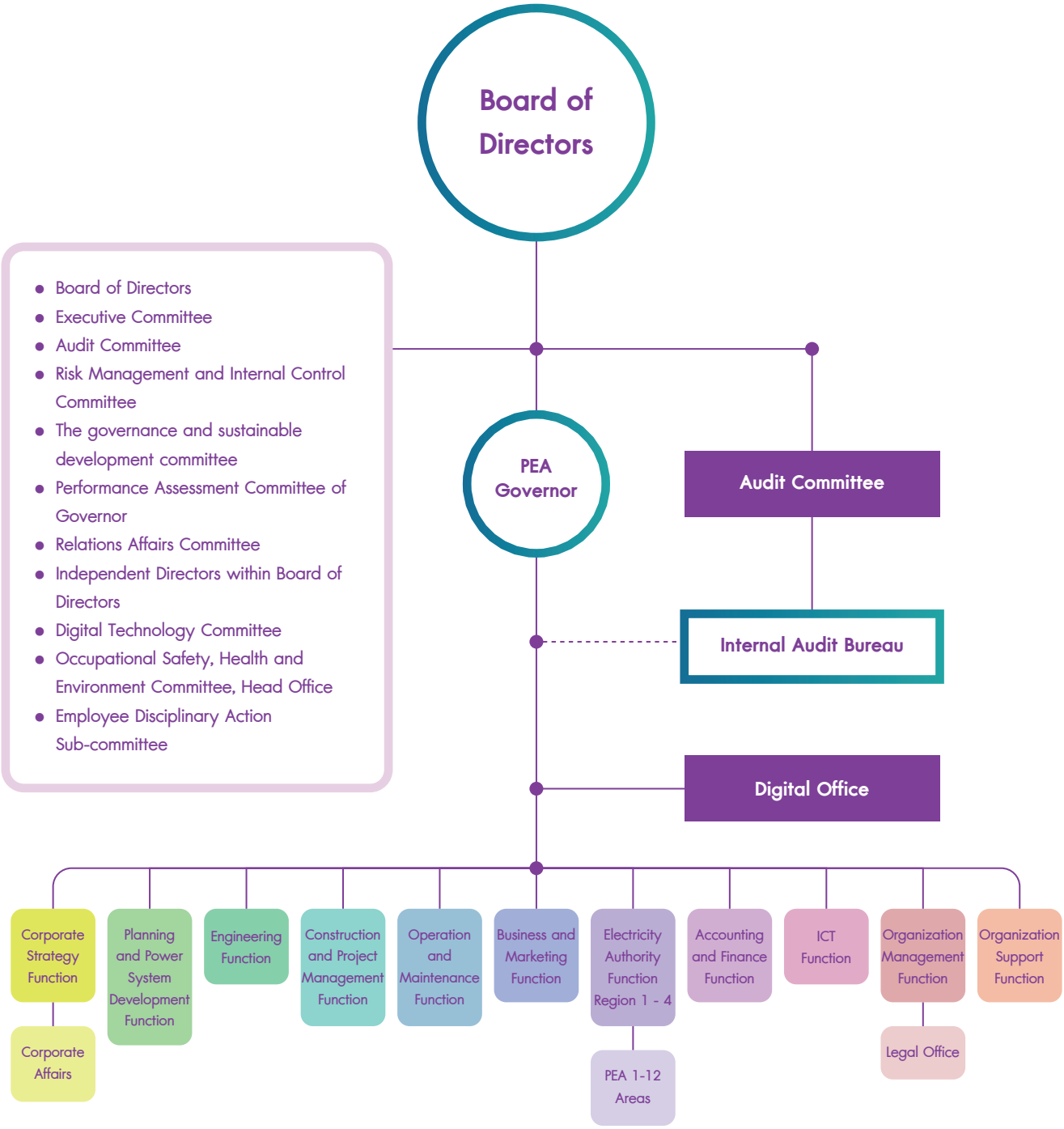
Operating system	Management	Action
2. Value-Added System	S4 Knowledge Management and Innovation	S4.1 Knowledge Management Process
		S4.2 Learning and Innovation Management Process
	S5 Business Management and Related Business Investment	S5.1 Planning Process and New Business Management
		S5.2 Supplementary Business Management
		S5.3 Governance Process in Subsidiaries and Joint Ventures
3. Electricity Distribution System	C1 Supply and Manufacture of Electric Power	C1.1 Supplying and Manufacturing Electric Power Management Process
		C1.2 Distribution Management Process
	C2 Planning and Development of Electricity Systems	C2.1 Planning and Developing the Electricity Systems Process
	C3 Designing Substations and Electricity Systems	C3.1 Designing Substations and Electricity Systems Process
	C4 Construction of Substations and Electricity Systems	C4.1 Construction Process of Substations and Electricity Systems
	C5 Asset Management and Maintenance Electricity Systems	C5.1 Maintenance of Substations and Electricity Systems Process
		C5.2 Maintenance of Substations and Electricity Systems Process
	C6 Electrical System Operation	C6.1 Overseeing the Electricity Distribution System Process
		C6.2 Operating Process in Substations
		C6.3 Operating Process for Electricity Distribution System Operation
4. Customer Relations System and Marketing	C7 Customer Relations and Marketing	C7.1 Strategic Planning Process in Customer Relations and Marketing
		C7.2 Service Chanel Management Process
		C7.3 Building Customer Relations Process

Operating system	Management	Action
	C8 Customer Service	C8.1 Customer Service and Support Process in Core Business
		C8.2 Service Process and Support Customers in Related Businesses
5. Resource and Service Management System	E1 Supply Chain Management	E1.1 Purchasing Planning Process
		E1.2 Procurement Management Process
		E1.3 Stockpile Management Process
		E1.4 Purchasing Deliverable Management Process
	E2 Budget of Accounting and Finance	E2.1 Budget Process
		E2.2 Accounting Process
		E2.3 Finance Process
	E3 Management and Development of Human Resources	E3.1 Management of Manpower Process
		E3.2 Human Resources Development Process
		E3.3 Welfare Management Process and Human Relations Management Process
		E3.4 Safety, Occupational Health, and Environment Management Process
	E4 Public Relations and Corporate Image	E4.1 Image and Branding
		E4.2 Public Relations Process
	E5 Organization Management	E5.1 Organization Management Process

Operating system	Management	Action
6. Digital Technology Management	E6 Management and Development of Human Resource	E6.1 Strategic Planning Process and Digital Technology Project Management
		E6.2 Project Management Process
		E6.3 Digital System Management Process
		E6.4 Management Process of Infrastructure of Digital Technology
		E6.5 Cyber Security Management Process
		E6.6 Digital Technology Service Management Process

Structure of the Operation for Sustainability (2-9)

PEA had the management structure for the organization's sustainability. In 2020, the organization revised the structure by establishing the Digital Office, Business and Marketing Function, Organization Management Function, and Organization Support Function to be in line and support the operation management efficiently, support new business development and the growth to be in line with PEA's current mission.



Service Areas (2-1)

PEA's head office is located at 200 Ngamwongwan Road, Lat Yao, Chatuchak, Bangkok 10900, responsible for electricity distribution in 74 provinces of Thailand except for Bangkok, Nonthaburi, and Samut Prakan, which accounts for 99% of the country or approximately 510,000 square kilometers with 21,347,929 of electricity users.

Service Office (2-6)

North	Northeast
3 of PEA Area Offices	3 of PEA Area Offices
42 of PEA Grade 1-3 Offices	45 of PEA Grade 1-3 Offices
86 of PEA Branch Offices	87 of PEA Branch Offices
120 of PEA Subbranch Offices	189 of PEA Subbranch Offices
PEA Shop 17 Venues	PEA Shop 18 Venues
Small Power Producers 11 Venues	Small Power Producers 2 Venues
Substations 143 Venues	Substations 137 Venues
Central	**South**
3 of PEA Area Offices	3 of PEA Area Offices
67 of PEA Grade 1-3 Offices	44 of PEA Grade 1-3 Offices
49 of PEA Branch Offices	62 of PEA Branch Offices
64 of PEA Subbranch Offices	93 of PEA Subbranch Offices
PEA Shop 27 Venues	PEA Shop 23 Venues
Small Power Producers 6 Venues	Small Power Producers 9 Venues
Substations 309 Venues	Substations 127 Venues

Electricity Users (2-6)

Electricity Users		2018 (customers)	2019 (customers)	2020 (customers)	2021 (customers)
Large Power Customers	Industrial Sector	35,516	36,213	37,066	37,856
	Large Scale Commercial Customers	46,774	50,408	50,394	48,810
Small Power Customers	Residential	17,450,482	17,816,406	18,308,892	18,757,812
	Small Scale Commercial Customers	1,687,736	1,733,449	1,759,639	1,817,650
Government Sector		548,246	557,389	578,726	595,404
Total		19,768,754	20,193,865	20,734,717	21,257,532

Corporate Information

Number of Employees and Workers (2-7, 2-8)

Number of Employees and Workers by Genders	2018		2019		2020		2021	
	Unit (Person)	%	Unit (Person)	%	Unit (Person)	%	Unit (Person)	%
Employee								
Male	21,862	73.71	21,469	73.82	20,962	73.88	20,870	74.09
Female	7,797	26.29	7,615	26.18	7,410	26.12	7,298	25.91
Total	29,659	100	29,084	100	28,372	100	28,168	100
Worker								
Male	3,915	66.66	3,911	66.73	4,047	66.75	3,705	65.36
Female	1,958	33.34	1,950	33.27	2,016	33.25	1,964	34.64
Total	5,873	100	5,861	100	6,063	100	5,669	100
Grand Total	35,532		34,945		34,435		33,837	

Remark: *Employees means 1) Group of executive positions such as Deputy Governor, Assistant Governor, Manager of Electric Administration Area, Director of Internal Audit Bureau, Director of Legal Office, Director of Office of the Governor, Department Director, … , Manager of PEA Grade 1, Department Deputy Director, Division Manager, Director of System Management Center, Manager of Electric Vocational School, Manager of PEA Grade 2-3 and equivalent position, Division Deputy Manager/Assistant Manager, Deputy Manager/Assistant Manager of System Management Center, Deputy Manager/Assistant Manager of Electric Vocational School, Deputy Manager of PEA Grade 1-2, Manager of PEA Branch, Assistant Manager of PEA Grade 3, Section Chief, Manager of PEA Subbranch, Section Assistant Chief 2) Group of expertise such as Expert Level 12-13, Professional Officer level 9-11, Specialist Level 9, Specialist Level 8, Professional Officer Level 7-8, Technical Officer Level 7 and 3) Group of practitioners such as Professional Officer/ Technical Officer Level 4-6, Technical Officer Level 2-3.*

Workers means monthly contracted workers who consent to work for an employer to receive a monthly salary in accordance with the manpower plan, including permanent the Governor Office, Deputy Governor Office and Assistant Governor Office, i.e., driver, housekeeper, etc.

Area	Employee				Worker			
	2018 Unit (Person)	2019 Unit (Person)	2020 Unit (Person)	2021 Unit (Person)	2018 Unit (Person)	2019 Unit (Person)	2020 Unit (Person)	2021 Unit (Person)
Head Office	4,128	4,040	3,917	3,895	167	168	170	166
North	5,926	5,769	5,572	5,561	1,233	1,163	1,212	1,219
Northeast	6,944	6,786	6,610	6,583	1,421	1,525	1,564	1,400
Central	7,103	7,054	6,953	6,859	1,752	1,693	1,775	1,671
South	5,558	5,435	5,320	5,270	1,300	1,312	1,342	1,213
Total	29,659	29,084	28,372	28,168	5,873	5,861	6,063	5,669

Electric Energy Sales

Year	Electric Energy Sales (million kWh.)
2016	129,673.65
2017	132,400.86
2018	134,673.89
2019	138,178.13
2020	134,867.12
2021	139,687.23

Organizational Memberships (2-28)

PEA operates by complying with the PEA Act, B.E. 2503 (1960) and embraces requirements, frameworks, standards, and principles of the country and the international standards such as the requirements of the State Enterprise Policy Office (SEPO), Enterprise Risk Management Framework by COSO ERM, Business Continuity Management Systems (ISO/IEC 22301), Information Security Management System (ISO/IEC 27001), Social Responsibility (ISO 26000), Global Reporting Initiative (GRI Standards), United Nations Sustainable Development Goals (UNSDGs) etc. PEA applies these requirements in its operation to improve the organization to be efficient in the operational guidelines.

Apart from that, to drive forward to the efficient operation together with delivering value to community and society, PEA participated in membership or cooperated with the governmental agencies and private sector as follows:

- Key Operation (Power Distribution) for example, the Energy Policy and Planning Office, the Energy Regulatory Commission, the Engineering Institute of Thailand under H.M. the King's Patronage, the Institute of Electricity Supply and Electronics Engineers (IEEE Thailand), Electricity Supply Industry Association of Thailand (TESIA), Heads of ASEAN Power Utilities/ Authorities (HAPUA), and the Electricity Reliability Improvement Committee of the three electricity authorities etc.
- Other Operations include the Thai Electrical and Mechanical Contractors Association, Personnel Management Association of Thailand (PMAT), Department of Skill Development, Ministry of Labour, Department of Environmental Quality Promotion, and Ministry of Natural Resources and Environment.

05

CORPORATE GOVERNANCE AND ANTI-CORRUPTION TO CREATE SUSTAINABLE VALUE (3-3)

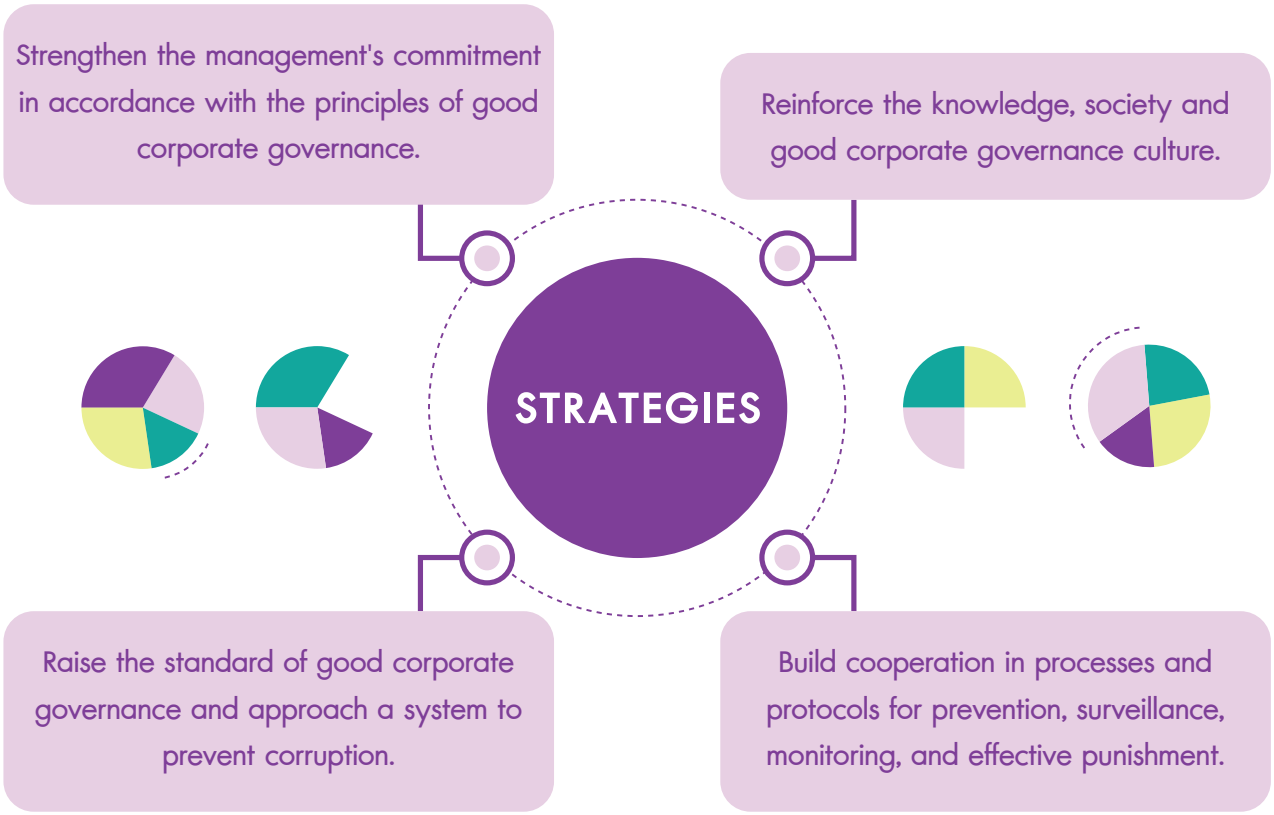
The PEA emphasizes the importance of good corporate governance by concentrating on management under operational standards and the connection between regulatory agencies, boards of directors, executive committees, and employees to promote competitiveness and effective long-term performance. PEA also considers ethics and responsibility to stakeholders both inside and outside the organization, which performs with transparency and accountability. PEA works with the board of directors regularly to ensure that business regulations are adhered with honesty and prudence by the governance and sustainable development committee. Moreover, the executive committees of the PEA are expected to conduct themselves with integrity and caution to demonstrate the organization's commitment to eliminating all forms of corruption and promote the Corruption Perception Index (CPI), which is critical to the country's overall development.

Target (3-3)

- Operating a business in accordance with good governance, achieving ethical standards and codes of conduct for directors, executives, and employees, as well as the main profession of the organization, and maintaining a positive public image and recognition.
- Free of corruption or bribery in all forms.
- All stakeholders accept and trust in the PEA's good governance operations, and the overall level of stakeholder satisfaction must not go below 4.0000.
- Maintain the result of the Integrity and Transparency Assessment (ITA) in the 90–100 range of rating scores equivalent to AAA level or the leader (first rank) in the Energy State Enterprise group.

Strategy (3-3)

The PEA defined the strategy according to 2017 - 2022 Corporate Governance, Corruption Preventing and Combating Master Plan of PEA (4th edition revised in 2022), which covers both ethical standards, core values of business ethics, and code of conduct for directors, executives, and employees, as well as the PEA's corporate core profession by defining concrete support plans with regular monitoring on operating results, such as plans to enhance good corporate governance, culture and values of honesty, morality, ethics, transparency, and anti-corruption in work operations, which includes 4 main strategies follow:

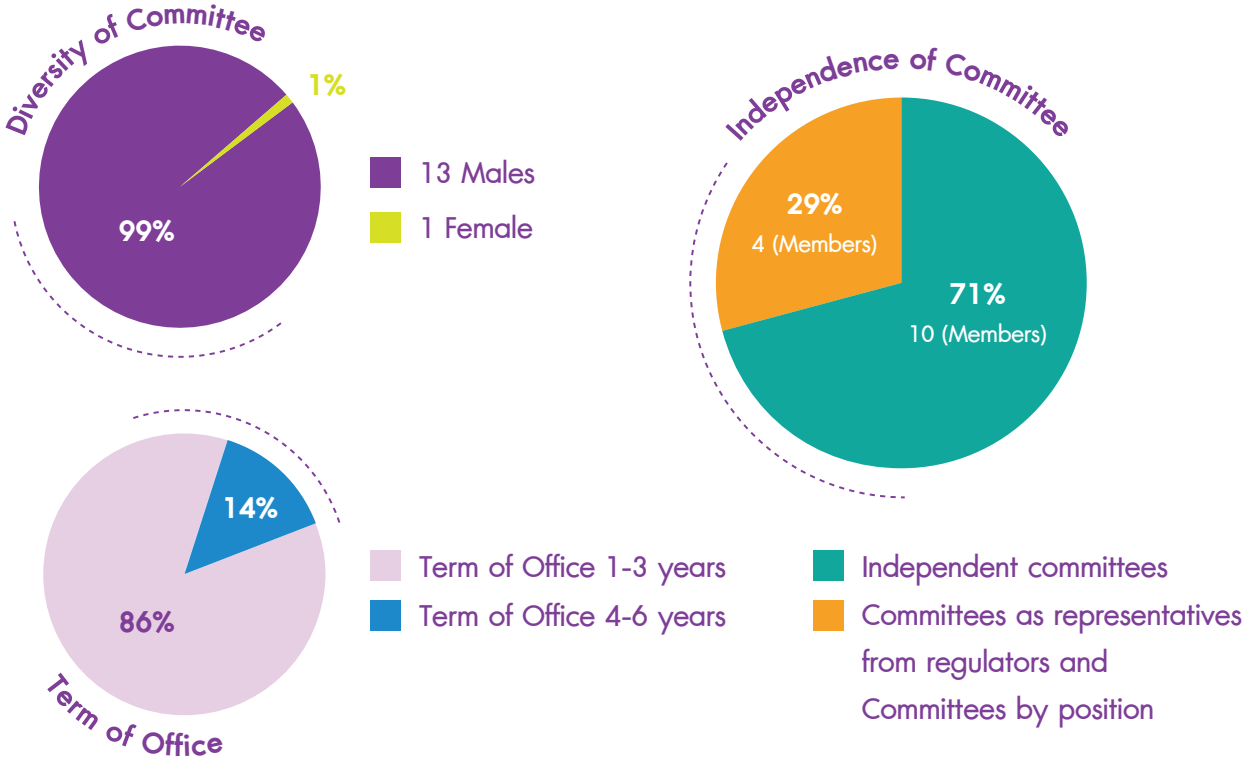


Management Approach of Corporate Governance and Anti-Corruption (3-3)

The PEA is committed to developing and promoting good corporate governance practices following international standards, as well as focusing on efficient operations coupled with fair treatment of stakeholders through information disclosure, verifiable transparency, executive and employee morality and ethics, anti-corruption, ethical standards, and professional code of conduct, and adhering to the philosophy of Sufficiency Economy as a guideline for management. In addition, PEA has announced good governance principles and guidelines to promote transparency and prevent corruption, as well as the PEA's operational standards for transparency and sustainability, which require executives and staff from all departments to follow best practices across the business.

Board Composition (2-11)

The PEA's Board of Directors comprises a chairman and 14 committees, 13 males and 1 female. The Governor of PEA takes responsibility as a committee of the Board. Currently, there is 86 percent of the committees who have 1-3 years of term of office and there is 14 percent of the committees who have 4-6 years of term of office. In 2021, PEA had 10 independent external committees who have independence in decision-making and expressing their opinions and there were 4 committees by position. The structure of Board of Directors is under the principles and guidelines of good governance in state enterprises for the year 2019 of the State Enterprise Policy Office (SEPO) indicating that all state enterprises should comprise independent committees from outside at least one-third of all committees which is sufficient for affecting the opinions of the meeting and to ensure independence in decision-making. The committees should be knowledgeable and specialized in the contexts which are beneficial to state enterprises.



The chairman of the PEA's Board of Directors does not occupy the top executive of PEA to ensure balance and transparency, consequently, the chairman takes responsible as Head of corporate governance while the PEA's Governor takes responsible as Chief Executive Officer of PEA. However, in order to ensure the connection between the Board of Directors and management, PEA has nominated the Chief Executive Officer, the Governor, to take responsible as secretary of PEA's Board of Directors.

Nomination and Selection Process for PEA Board of Directors [2-10]

Qualifications of a person who can be nominated for the PEA's Board of Directors are as indicated in the PEA Act and the Standard Qualifications for Directors and Employees of State Enterprises Act. The qualifications include Thai nationality and having knowledge and experience in business administration, electricity, engineering, economics, or finance, as well as, having other qualifications and not being under any prohibitions as indicated in the Acts. Independent directors, that are not less than one-third of all directors, are selected from the list of Directors of State Enterprises (Director's Pool, DP) prepared by the Ministry of Finance. In addition, the person nominated as the PEA's directors must be considered by the subcommittee and approved by the state enterprise policy committee and the Cabinet.

Process for PEA's Board of Directors nomination in accordance with SEPO's Guideline

State enterprises submit list of nominated PEA's committees (more than double in number of state enterprise committees for PEA)

Approved by State Enterprise Committee

Selected by Scrutinizing Subcommittee, State Enterprises Committee

Submittes Selection result to State enterprise

Ministry of Interior

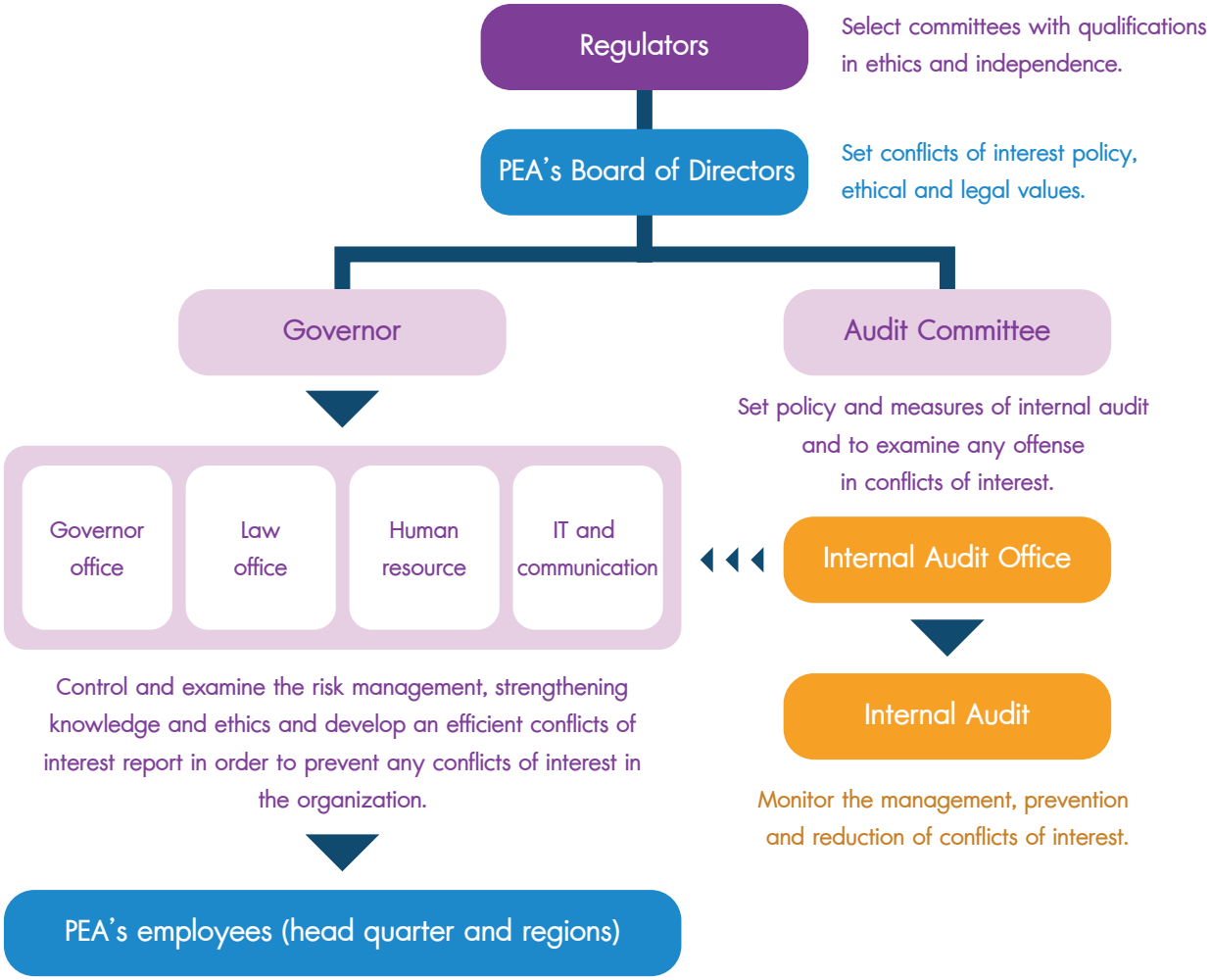
State Enterprise Policy Committee

Ministry of Interior

Cabinet

Conflicts of Interest Prevention (2-15)

The prevention of conflicts of interest is highly crucial to the PEA. As indicated by the PEA Act, B.E. 1960, the PEA's Board of Directors must not be a shareholder in the contract with PEA or any direct or indirect transactions made for PEA. Furthermore, as described in the corporate governance manual and guidelines of PEA, the PEA's Board of Directors takes responsible on setting conflicts of interest policy, ethical and legal values and appointing internal audit committee to set policy and measures of internal audit and to examine any offense in conflicts of interest. In addition, the committee takes responsible in controlling and examining the risk management, strengthening knowledge and ethics, and developing an efficient conflict of interest report in order to prevent any conflicts of interest in the organization.



3 cases of COI report

- Case 1 Annual report
- Case 2 New appointment (committee) appointed, Rotated, Promoted/Position and new hired (executive and employee)
- Case 3 COI occurred during the year

Roles and Duties of the Board of Directors (2-12, 2-13, 2-14)

The PEA's Board of Directors appointed by the Cabinet take responsible in ensuring good corporate governance for the organization. The Board of Directors appointed 11 specific committees with their roles and responsibilities to monitor and consider all action plans of PEA prior to submitting to the PEA's Board of Directors. Specifically, the governance and sustainable development committee has responsibilities in ensuring good governance and sustainability in all policy and action plans and also ensuring the integration of good governance, risk management and laws and regulations compliance. The committee also takes responsible in reviewing the implementation guidelines of good governance, anti-corruption, CSR in process, and sustainable development in environment, social and governance dimensions by comparing to the international standard and submitting to the PEA's Board of Directors.

Knowledge Improvement for PEA's Board of Directors (2-17)

The PEA develops and promotes knowledge for the governance and sustainable development committee by providing 6 courses of good corporate governance (CG) and 1 course of CSR to the committee as followings:

1. Seminar on the topic "Performance Appraisal System for State Enterprise" in accordance with the State Enterprise Assessment Model (SE-AM)
2. Training course "Director Certification Program (DCP 303)" from Thai Institute of Director
3. Training course "Digital Transformation for CEO #3"
4. Training course "Director Leadership Certification Program (DLCP) 1/2021" from Thai Institute of Director
5. Training course "Financial Statement for Directors (FSD) #44" from Thai Institute of Director
6. Seminar on the topic "Good Governance and Anti-Corruption for State Enterprises"
7. Seminar on the topic "Cho Sa-at Village Project and the roles and responsibilities of the PEA's Board of Directors"

Performance Evaluation of the Board of Directors (2-18)

Performance of PEA's Board of Directors is evaluated based on their performance during the PEA's Board of Directors meeting which is under the corporate governance manual and guidelines of PEA. Sustainability criteria are not included in the evaluation; however, sustainability of PEA will be continuously considered by the Board of Directors through the submission of the governance and sustainable development committee. In addition, to make the operation of PEA in line with the international sustainability standard, PEA is considering to integrating sustainability criteria into the performance evaluation of PEA's Board of Directors.

Remuneration for PEA's Board of Directors (2-19, 2-20)

The PEA follows the resolution of the Cabinet of 24th April 2019 that approved the adjustment of rate and criteria for monthly and meeting allowances for state enterprise's committee, subcommittee or other working groups of group 1: large state enterprise. The monthly and meeting allowances for PEA's Board of Directors were adjusted accordingly to the resolution of the Cabinet as followings.

Monthly allowance

The chairman of state enterprise's committee receives 2 times higher than that of the committee.

1) Chairman receives 20,000 baht
2) Committee receives 10,000 baht

In case that the committee does not hold a position for a full month, monthly allowance shall be paid in a ratio of position holding period.

Meeting allowance

1) Meeting allowance shall be paid once a month. The meeting allowance could be paid more than once a month for a reasonable case; however, overall payment of the meeting allowance must not exceed 15 times / year.
2) Meeting allowance for the chairman of state enterprise's committee is 25 percent higher than that of the committee: the chairman receives 25,000.- baht, committee receives 20,000.- baht.

Meeting allowance for subcommittee's meeting is 0.5 times of the meeting allowance for state enterprise's committee (10,000 baht or lower/ person/ meeting). The chairman receives 25 percent higher than that of the committee and the allowance shall be paid per a meeting attended. The subcommittee's meeting allowance for the state enterprise's committee cannot exceed two meetings per month and the allowance for each subcommittee cannot exceed once a month.

In addition, in 2021, the PEA has utilized digital technology to create comprehensive governance and anti-corruption process, including monitoring, evaluation, and potential risk management. Moreover, digital technology has been used to promote communication with all stakeholders, especially in surveillance and monitoring of all possible corruption which strengthens and extends the efficiency of corporate governance and is considered one of the main factors to prepare for PEA's digital utility:

1. Anti-corruption is a part of the organization's strategic plan for the years 2021 to 2026, and it has been defined as the first strategic objective (SO1), which is defined as a business operation that complies with good governance for sustainable growth, and that performs an assessment and reports to the governance and sustainable development committee for consideration and development of suggestions every quarter.
2. Revisions of corporate governance policy as additional transparent and anti-corruption practices for executives and employees using as a performing framework. The PEA responds the needs of stakeholders and provides an opportunity for stakeholder participation in recommending and criticizing PEA's operations as well that beneficial to use the information for operational development in the future.
3. The PEA announced the 2021 No Gift Policy for all festivals and opportunities to highlight PEA's commitment in running a transparent, anti-bribery, and corruption-free business.

4 The PEA established the specific division for regulation of corporate governance, monitoring and reporting issues about compliance and fraud and corruption risk assessment both internal and PEA's operational association for problems analysis and enhancement appropriately.

5 Nomination of top management to represent an ethical role model for employees and the PEA's values (TRUSTED) by producing video clips that demonstrate the essential behavior and disseminate them through various public relations channels both within and outside the firm. On the other hand, PEA organized the PEA TRUSTED HEART activity to select the optimal employees by sharing stories about themselves or coworkers who follow employee ethics or drive the factor of corporate values.

6 Soft Control activities were designed to improve morality, ethics, and transparency in the PEA's operations to promote the environment and raise awareness among PEA employees. Nonetheless, all employees must complete the Control Self-Assessment (CSA) at least once a year.

7 The PEA has continuously participated in the Integrity and Transparency Assessment of Government Organizations project by the National Anti-Corruption Commission for 8 years. This participation can elevate PEA's position as a real transparent organization by applying and using the assessment results to develop directions for constant practical improvements and advancements, particularly in ethical and transparent operations.

8 The PEA systematically manages the whistleblowing and corruption and misconduct complaints, allowing an engagement approach of stakeholders to evaluate PEA's corporate governance and equally create fairness for all stakeholders. More than 20 distinct contact channels are available, including the PEA Application, PEA Website, 1129 PEA Contract Center, and listening to customers through the media, among others.

9 Digital technology has been applied in the corporate governance information system, or CG e-System, comprising the following:

10 The Compliance Roadmap in Phase 1 (the year 2021) has been started, focusing on the enhancement, and upgrading of CMS to create readiness in managing compliance for continuous effectiveness.

11 The Integrity Pact was established for projects worth 1,000 million baht or more to ensure transparency and confidence to promote a fair competition for government procurement initiatives. All three parties, namely the PEA, bidders, and observers, must sign a contract.

12 The goals of the PEA's transparent and sustainable project are to monitor and review operations in over 1,000 units of PEA's departments around the country, both central and regional, to be committed and conscious of transparency in operations, and to work together to assist in driving and developing operational efficiency.

Channels of Receiving Complaints and Customer Feedback (2-16, 2-26)

Voice-based Channel

- 1129 PEA Contact Center
- Corporate Fixed-Line

Government Sector-based Channel

- PEA Anti-Corruption Center
- Regulatory Agencies (Ministry of Interior, Office of the Energy Regulatory Commission, etc.)
- Damrongdhama Center of Ministry of Interior
- Office of the Permanent Secretary, Prime Minister Office (www.1111.go.th)
- P.O. Box Lak Si, Bangkok
- Others (such as Office of the National Anti-Corruption Commission, Office of Public Sector Anti-Corruption Commission, State Audit Office of the Kingdom of Thailand, etc.)

Media and Social Network-based Channel

- PEA Website (www.pea.co.th)
- Email
- PEA Smart Plus
- Radio, TV, Newspaper and Local Media
- IA/IR Chat

Interaction-based Channel

- Direct Contact at the Office
- Activities to Listen to Stakeholder Feedback

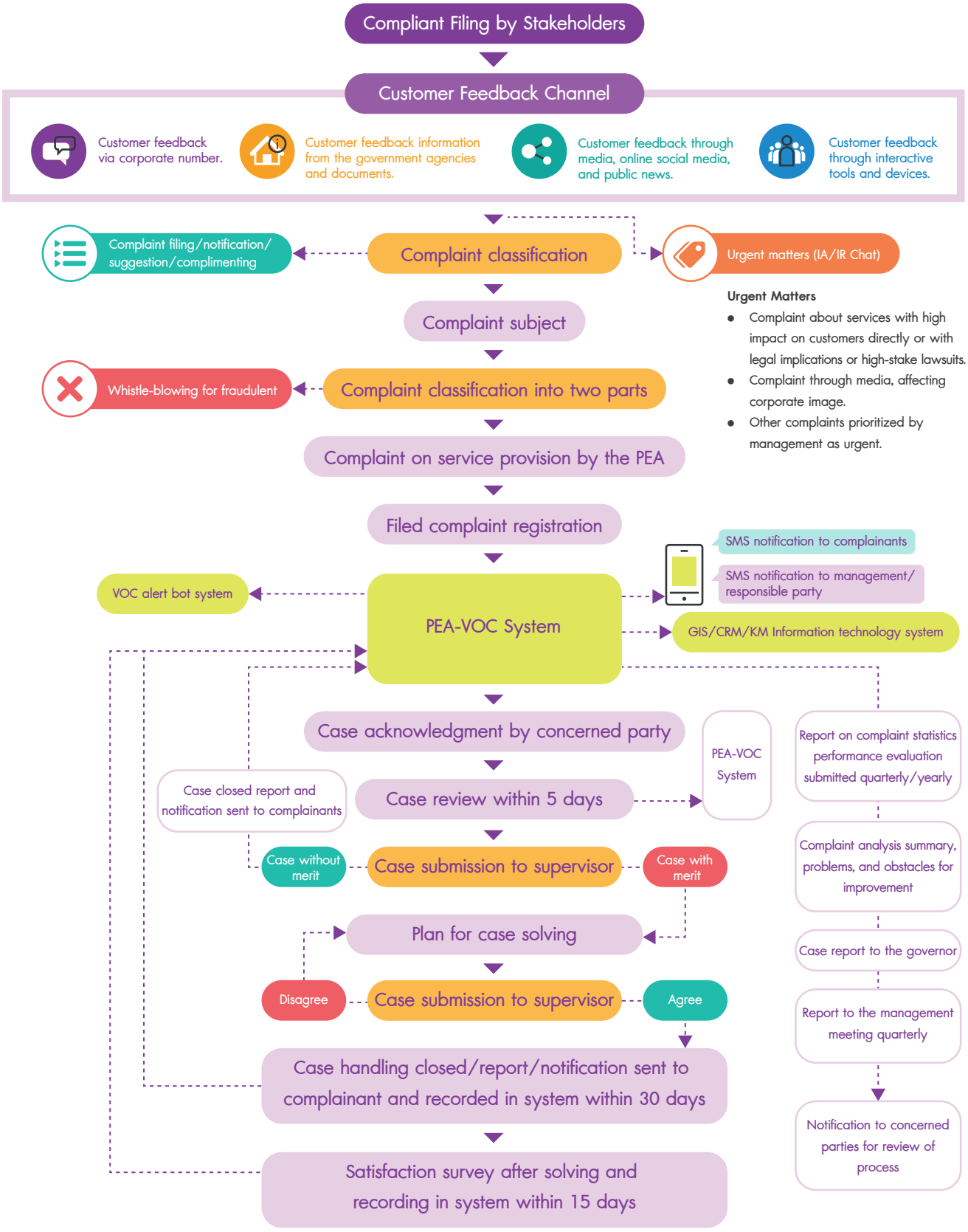
The PEA has an information system, known as the PEA-VOC System, that is used for complaint management and also customer feedback management to exhibit a firm's transparency and ensure fairness for all stakeholders. It enables quicker, more convenient complaint management, tracking, and response performance reporting for relevant stakeholders within the period permitted by using the same database throughout the organization. The PEA-VOC system can report various information, with PEA categorizing Types of Complaints into 6 categories and Complaints of Corruption and Misconduct into 8 categories, namely:

Types of Complaints	Complaints of Corruption and Misconduct
1. Electricity Quality	1. Procurement Process
2. Service	2. Human Resource Process
3. Electricity Unit Recording / Billing	3. Service Process
4. Electricity Cut-off	4. Financial Process
5. Employee Behavior	5. Misconduct / Code of Conduct Violation
6. Others	6. Electric Power Systems Process
	7. Organizational Management Process
	8. Others

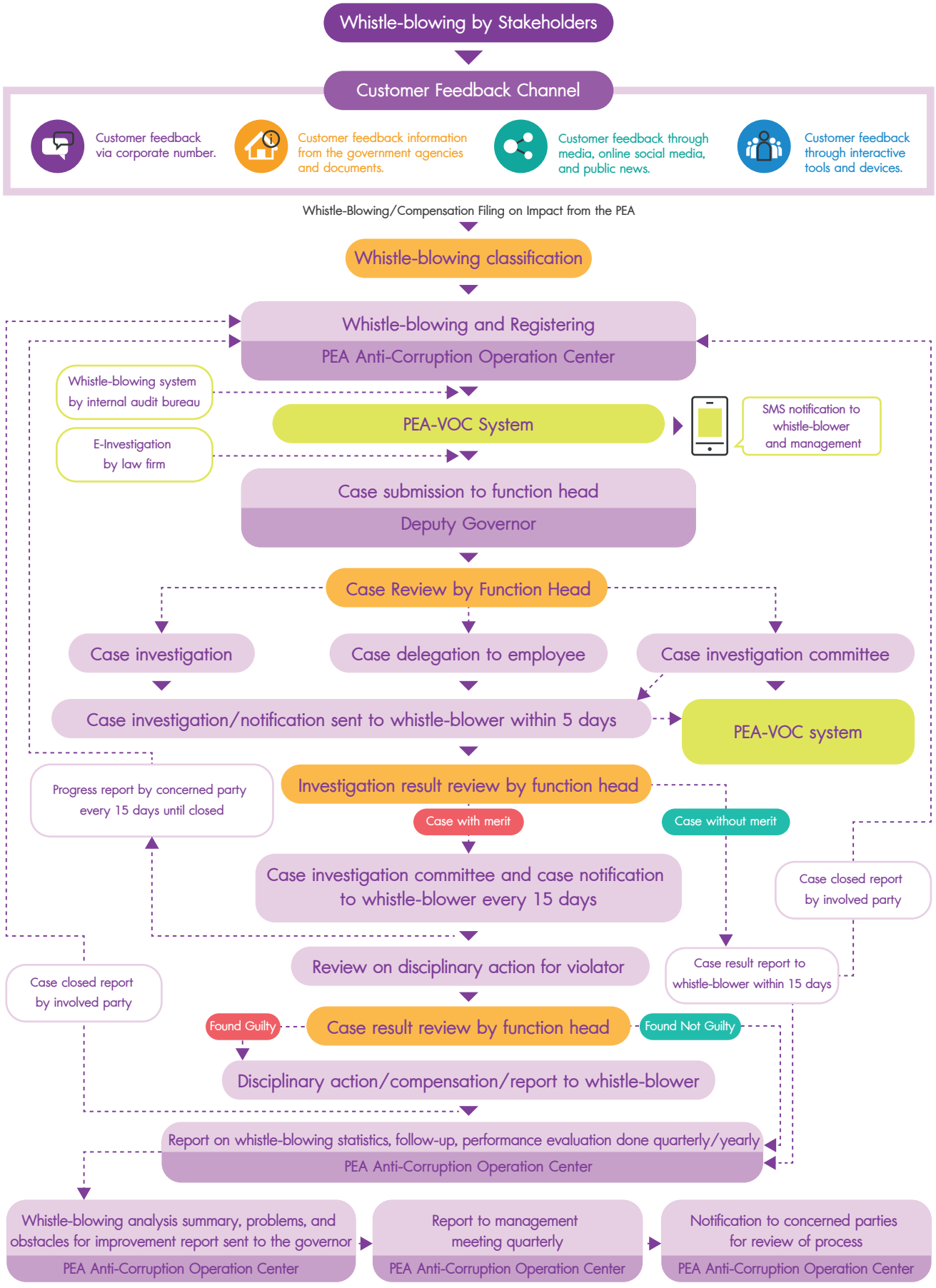
Protection of Complainant and Whistle-Blower

The PEA has clearly specified rules in the manual to increase its complaint management efficacy. The manual states that PEA officials responsible for complaints and whistleblowing must protect the privacy of the complainants and whistle-blowers. The information must be preserved confidentially and reasonable discretion in protecting complainants, whistle-blowers, witnesses, and inspected data must be considered. Moreover, they will be protected from harm or unfairness that may arise from such complaints, testimonies, or information furnished.

Management of Complaints of Services (2-16, 2-26)



Whistle-Blower



Corporate Governance and Anti-Corruption Performance

• All of the PEA Authority's institutes, a total of 4, represented as 23.53 percent of all entities that were assessed for fraud and corruption risk and the detailed results are presented as the following table. (205-1)

Operating Division	Significant Risk	Corrective and Preventive Action
1) Engineering Function 2) Construction and Project Management Function 3) Operation and Maintenance Function 4) Organization Support Function	R06 Bribery, which will lead to the benefit of the contracting party.	- Integrity Pact.
	R07 Determination of TOR/features of products or services specific to a particular company.	- Work plan to improve the procurement process in compliance with the State Procurement and Supplies Management Act B.E. 2017, and the Ministry of Finance's Public Procurement and Supplies Management Regulations B.E. 2017. (study, analyze, consider solutions).

• The PEA entirely provided the policy communication and training practices, associated with anti-corruption to all committees, employees, and business partners. In 2021, the committees, employees, and business partners, who were communicated and trained, including 28,289 personnel, presented 99.37 percent of total personnel as well as business partners of 2,605 personnel, represented as 98.58 percent of all partners. (205-2)

Number of People Informed about Anti-Corruption Policy and Measures

Stakeholders	Number of People Informed about Anti-Corruption Policy and Measures	Percentage
Committee	19	100
Employee by Regions		
Head Office	3,757	98.67
North	5,506	99.48
Northeast	6,498	99.92
Central	6,725	98.82
South	5,184	98.82
Business Partners	2,605	98.58

Number of People Trained on Anti-Corruption Courses

Stakeholders	Number of People Trained on Anti-Corruption Courses	Percentage
Committee	19	100
Employee by Regions		
Head Office	4,917	100
North	10,693	100
Northeast	9,633	100
Central	9,569	100
South	8,079	100

- In 2021, the PEA was not faced with any lawsuits of corruption and no fraud cases requiring a business partner to withdraw the contract or suspend contract renewal. However, the total number of corruption-related incidents within the organization equaled 8 incidents, which related to internal fraud involving assets stealing for all, as a result, 3 employees were fired and 5 employees were moved to inactive posts by PEA. (205-3)
- Total complaints in 2021 were 90 cases, fully responded to 55 cases, including 10 were true frauds and 36 were unfounded, representing an increase of 55.17 percent from the previous year.

Types of Complaints	Number of Complaints	Percentage
1. Procurement Process	7	7.78
2. Human Resource Process	13	14.44
3. Service Process	9	10.00
4. Financial Process	9	10.00
5. Misconduct / Code of Conduct Violation	47	52.22
6. Electric Power Systems Process	4	4.44
7. Organizational Management Process	-	-
8. Others	1	1.11
Total	**90**	**100.00**

For 90 complaints management, the PEA responded and closed 55 complaints (61.11 percent), and the remaining 35 cases are still in the progress. As a result, the pre-determined target of complaint closed is achieved. However, PEA has established responding guidance to increase the efficiency of operations and to reduce the number of complaints, which will be implemented in 2022, as measures such as expediting the monitoring process and investigations to make progress and reach a resolution as soon as possible, integration between information systems and whistleblowing to be able to work together, currently, there are 4 systems, namely PEA-VOC System, a database system for reporting fraud and misconduct by the PEA internal audit, a system for monitoring the offenders (e-Investigate), and Voice of Stakeholder (VOS). Moreover, PEA integrated the introduction of the information system of the Anti-Corruption Organization of Thailand (ACT) with PEA's operating processes.

- Soft Control is divided into two parts: (1) raising awareness of good corporate governance, morality, ethics, and transparency in operations, and (2) assessing awareness and application of good corporate governance, morality, ethics, and transparency in operations through activities and training courses to strengthen corporate governance and anti-corruption in operations (Soft Control) for the year 2021 both in the central and regional throughout the organization, where 42,891 executives and employees took part in this activity.
- The PEA declared its intention to prevent and suppress corruption in 2021 with the concept of "PEA Transparency & Sustainability Confirmed" which engaged executives and employees cooperating via a video conference platform and was broadcast to 900 PEA entities across the country to demonstrate a practical intention and transparent performance in line with corporate governance principles. As a consequence, 31,072 persons participated in the survey, accounting for 88 percent of the entire employees.
- In the Integrity and Transparency Assessment (ITA) from the National Anti-Corruption Commission in 2021, the PEA received a score of 98.34 percent (rating score: AAA), which is considered the highest result in 8 years since being assessed for the first time in 2014, as well as placing PEA in the 1st rank of all agencies in the energy and utilities state enterprise sector, and Ministry of Interior as well as being the 6th rank of all attending state enterprises.
- The management results in the following digital technology application in the corporate governance information system (CG e-System):

  - The assessment score on awareness and application of corporate governance (CG Testing) was 95.04 percent, exceeding the target of 95 percent.

  - The acknowledgement of corporate governance practice (CG Acknowledgement) by management levels and employees was 99.19 percent, which was higher than the aim of more than 90 percent.

  - The reporting on individual and public conflicts of interest by the board, executives, and employees of PEA (COI Reporting) for the annual report has been 100 percent for six consecutive years (2016 - 2021).
- The results of the satisfaction survey on stakeholder transparency in the PEA procurement process suggested a high level of satisfaction, or 4.17 averaged points, approved by 99 people who are PEA stakeholders by questionnaire-based assessment of respondents. In 2021, PEA received no complaints about unfair competition complaints from competitors or business partners.
- The PEA has summarized the management results of the Integrity Pact Project under the PEA's Good Corporate Governance, Prevention and Suppression Corruption Performance Report for the year 2021 and presented it to the governor and the governance and sustainable development committee every quarter. In 2021, 5 projects of the Integrity Pact Project were processed.

Operating Division	Project
Engineering Function	1. Submarine cable construction work to Koh Tao Surat Thani Province with 1,776 million baht of project value. 2. Contract for the construction of 115 KV submarine cables according to the 115 KW submarine cable construction project to replace and increase the power supply capacity to Koh Samui Surat Thani Province with 2,133.05 million baht of project value.
Construction and Project Management Function	3. Development of transmission and distribution systems in phase 2 with 77,334 million baht of project value.
Operation and Maintenance Function	4. Efficiency enhancement of the system of power distribution center system with 4,530 million baht of project value.
Organization Support Function	5. Purchasing 2,002,500 electronic meters with 3,291.23 million baht of project value.

Improvement Plan for Future Operation (3-3)

- Through corporate training courses, particularly the bribery topic for the PEA's technical students, the target is expanding in good corporate governance and anti-corruption awareness and knowledge development.
- The PEA will associate and integrate the information system with good corporate governance and anti-corruption for improving the procurement system, which is expected to be completed in 2023.
- According to the appointment of the Ministry of Interior, fraud and corruption risk assessment is more thoroughly covered in all the PEA procurement projects, both core and supplementary business.

TREND AND DIRECTION ON BUSINESS CHANGE

Due to the change in energy technology and electricity consumption, the government has developed an improvement plan for the electricity business structure following the country's energy operation plans. Therefore, it aims to reform the electricity industry into healthy competition or "Independent Energy Trading" under the operation of PEA, which is the service provider for the electricity grid and power distribution. PEA always supports and considers the significance of independent and fair competition. Furthermore, PEA sets up the operation guidelines for fair market competition without any authority enforcement or the political relationship to avoid any improper market advantage. PEA also focuses on enhancing transparency and fairness of its operations and personnel.

Target (3-3)

- Preparing and developing the employees' knowledge and capability to keep up with the transformed technology and electricity in the future with ability to compete with competitors.
- Developing quality of products and services with reasonable price for everyone to increase well-being of electricity users and enhance the stakeholders' satisfaction.
- Preparing PEA to support the alteration of electricity business structure of the country and drive itself to achieve the targets and strategic positions and developing PEA's roadmap in accordance with the principles of justice, transparency, unexploited and preventing conflicts of interest in business competition.
- Developing specifications and procedures of the essential fundamental preparedness and agree with the roadmap such as Third-Party Access: TPA Code, Account Unbundling, Functional Unbundling, and Legal Unbundling.
- Communicating and comprehending with the responsible persons for the roadmap project in the Independent Energy Trading to develop the operational plan to implement the roadmap to the actual operation.

Strategy (3-3)

• Set up the strategic demand by specifying the necessity which influences the organization to develop an operational plan to support the changed structure of the electricity business in Thailand.

• Assess the strategic potential by analyzing the internal and external environments related to the present transformation of the PEA to the structure of the electricity business in Thailand.

• Identify the strategic direction of the PEA's transformation to the readiness of the organization to support each specific circumstance of independent energy trading competition.

• Specify successful factors of the PEA's structure of the electricity business transformation.

• Develop plan/ necessity project and serve the independent energy trading.

• Develop the human resource management in electricity market guidelines with the operational procedures, plan, or operational plans to uphold the electricity business transformation of the nation.

Independent and Justice Competitive Management (3-3)

In terms of opening the independent electricity business in the future, it can cause operation risks to PEA, particularly in the electricity industry competition, which can lead to decreasing number of electricity users. However, with the increase in the market choices, and direct impacts on revenue, so PEA has planned the operation to face the future competition as follows:

• Appoint the working and monitoring teams as well as assess the operational performance in the readiness for the opening of the independent energy.

• Design the Enterprise Architecture (EA) in the part of the process, software tools, and Data Management System for activities related to the opening of the independent energy business.

Independent and Justice Competition Performance

- Processing of communication with related agencies through a clarified meeting, discussion, and monitoring of the operation results by the monitoring and assessing committee to prepare for entering the independent energy trading and evaluate the readiness every month and quarter.
- Processing of the roadmap development of the PEA to uphold the electricity business transformation of the nation.
- Processing of developing the Third-Party Access: TPA Code for electricity purchasers in the market.
- Processing of the Functional Unbundling and Account Unbundling for transparency and justice for the service of the independent energy business.
- Processing for preparing the related legal such as Legal Unbundling.
- No offensive behavior in competition, including no trustworthy and monopoly trading opposition in 2021.

Improvement Plan for Future Operation (3-3)

- Monitor the announcement or the government policies related to the independent energy to improve the operations and continue planning for the effective competition in the future.
- Advance and promote the independent competition from the procurement process in the organization to be efficient to build trust and base for the fair competition in the future.
- Develop the operational plan to improve the previous functional performance harmoniously with the direction of the government policy related to the opening of the independent energy business in the present and for the future.
- Plan the strategy of the organizational structure transformation and human resource management to prepare for opening the independent energy business due to government policy.

07

RISK MANAGEMAENT OF THE ORGANIZATION

PEA highly recognizes the economic, social, and environmental transformation as well as considers the possible consequences for the organization's operation. PEA has forecasted the rapidly advanced technology leading to Disruptive Innovation in the energy business. The crucial factors of the changes are the cost of the operation and energy, which are the significant determinants in the successful direction of the operation. Accordingly, PEA highly acknowledge the organization's risk management by managing the factors, controlling activities, and other operational processes to protect or mitigate the severity and reduce the risks causes in order to ensure that PEA will be able to adapt to all changes in the business sustainably.

Targets

- Manage risk in line with the Risk Appetite level and achieving strategic targets.
- Build on stability and trustworthy in the quality of the electricity system and create value for the organization.
- Focus on stakeholders' responses.

Strategies

- Risk management as per the international standards COSO ERM 2017 and the guidelines of the State Enterprise Policy Office (SEPO) and the Ministry of Finance.
- Proactively manage risk management practices of the organization by following risk management policies and organization objectives, identifying types of risk, assessing risk through the perspectives of Likelihood and Impact, specifying risk management measures, as well as monitoring the risk assessment report.
- Developing the organization's risk management plan for 2021 and operating in accordance with the mitigation plan to lower the likelihood and impact which could cause the damage by reporting the risk assessment report to the Risk management Committee on a quarterly basis.

PEA determines the strategies into 3 phases as follows:

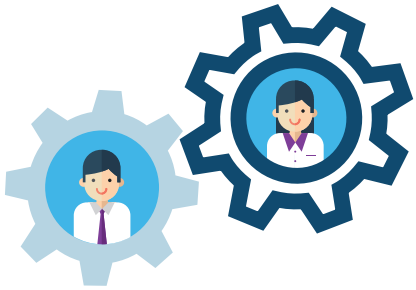
1. Short term (the target year 2021- 2022): Transform the organization into Digital Utility
2. Medium-term (the target year 2025): Create value added to PEA through the innovative energy
3. Long term (the target year 2027): Pace to be an electricity leader on national and regional scales

To drive to **achieve strategic positions and goals for each phase,** PEA has designed the business model for each step along with a periodic risk analysis called **"Intelligent Risk"**

Risk Management (2-25)

Risk management is an essential and continuous process and is considered as the PEA's fundamental business activity which helps PEA achieve the strategic and operational plan efficiently. These would lead to the accomplishment of the mission and desired objective. PEA reports risks on quarterly basis and reviews risk management results at least once a year by integrating affected internal and external risk factors in the organization. In addition, PEA assesses risks annually by surveying stakeholders and the management committee, including considering risk management monitoring results as of 2020 as one of the factors in risk identification for the year 2021.

PEA committee performs governance and supports risk management policy by appointing the risk management and internal control committee and PEA's board of directors are responsible for oversighting, governance, and monitoring the implemented risk management policy and framework. Moreover, the PEA committee collaborates with all risk management sub committees, where the Deputy Governors of each division are the president and the risk owner. The structure of risk management in greater detail is shown below:



The PEA Board

- Track the risk management result of PEA.
- Consider and approve risk issues.

The Governance and Sustainable Development Committee

- Supervise the integration between good governance, risk management, and regulation operations.
- Frame the governance regulations and sustainable development.

PEA Risk Management and Internal Control Committee

- Supervise/provide policies/framework/ guidelines/monitor and report risk management result/ communicate with the internal committee and the PEA board.

Audit Committee

- Verify risk management and internal control of PEA as well as provide opinions to the risk management committee and the PEA's internal control.

The Policy and Strategy Determination Committee

- Advise and give the investigation, the observation, and suggestions in the organization's risk management development plan.

Governor

PEA Internal Control Committee

- Collate the risk management and the PEA's internal control following the examination plan based on the risks.

PEA Risk Management and Internal Control Sub-Committee of All Functions

Affiliated Sections/Divisions/ Departments

- Risk assessment and management of the function.
- Develop division risk management plan.
- Operate by the risk management plan of the organization in the responsible business function.
- Monitor and report the operation results based on the internals risk management in the section and function.

Deputy Governor Corporate Strategy/ Risk Management Department and Internal Control Coordination Division

- Specify the guidelines/manual of risk management and internal control.
- Coordinate with the PEA committees and sub-committees to plan and monitor risk management results and the internal control.
- Set up meetings for the risk management committee and the PEA's internal control.
- Communicate to enhance understanding and publicize risk management and internal control.
- Assess risk and manage risk of the organization.

PEA Internal Control Committee

- Facilitate in the PEA's internal control assessment.
- Set up assessment guidelines, internal control, and the PEA regulations.
- Consider in planning/reporting the PEA's internal control results.
- Summarize the internal control operation and regulatory operations.

The Economic, Social, and Environmental Risk Management Results of PEA

Risk Issues	Significance to the PEA	Risk Reducing Measures	Results
Economic			
1. The operation of related business and governance mechanisms as well as the pursuing business opportunity of subsidiaries does not meet the goals.	The related business is significant for capability advancement in overall monetization for the organization as well as building future business opportunity in investment, energy conservation, and renewable energy in country and in Asian. PEA prioritizes the investment policy determination and Potential Portfolio Strategies design. The overall management of investment in other businesses crosses the PEA's operation and subsidiaries to maximize the value to the organization and maximize sustainable business development by responding to the changeable of the electricity system's structure.	• Prepare Emergency response plan: BCF to serve the Cyber-attacks. • Monitor IT security measures in accordance with ISO/IEC 27001:2013 standards. • Raise the awareness of users. • Operate SOC center to surveillance threats 24 hours. • Knowledge training to personnel about Cyber security. • Consider the guidelines to cope with Cyber and Malware attacks for ransom, including a monitoring plan complying with the Cyber security standard. • Provide related equipment.	• The accomplishment of the related business' operation plan = 100% equivalent to BSC level 5. • The business income for 2021 was beyond BSC goal level 5.
2. Digital Security	Ensure the security and trust in the digital technology operation to all stakeholders; it is the primary element to drive the organization to Digital Utility. Therefore, PEA prioritizes enhancing IT security and determining measures and guidelines for employees who provide services across the country.	• Prepare Emergency response plan: BCF to serve the Cyber-attacks. • Monitor IT security measures in accordance with ISO/IEC 27001: 2013 standards. • Raise the awareness of users. • Operate SOC center to surveillance threats 24 hours.	• Monitoring plan for Information security following the standards of ISO/IEC 27001: 2013 = 100% equivalent to BSC level 5.

Risk Issues	Significance to the PEA	Risk Reducing Measures	Results
	regarding Personal Data Protection and Consumer Privacy Protection. This important is to serve the use of the digital technology in the future, including suitable measures set for Cybersecurity and complying with international standards.	• Knowledge training to personnel about Cyber security. • Consider the guidelines to cope with Cyber and Malware attacks for ransom, including a monitoring plan complying with the Cyber security standard. • Provide related equipment.	
3. Incapable of maximizing the employees' capability in Multi-skills and Business mind to prepare for the operation under the transformed industrial structure.	The electricity industry rapidly transforms, so the PEA's personnel are required to have knowledge and capability in technology and innovation as well as prepare for the changes. PEA promptly proceeds in the knowledge management and for successors to get ready for continuous operation. The personnel's potential development has to support and drive the organization to respond to the organization's strategic objectives powered by human capital, digital technology, and innovation.	• Proactive plan in trust-building in personnel development to support HR Partnership together with monitoring plan for operation accomplishment of proactive HR (discuss with an agency to summarize discussion and monitoring results to track the progress). • New proactive recruitment plan and professional recruitment. • Training and personnel development projects in Smart Grid and the annual training plan in HR Action Plan.	• Human resource management, which was personnel's skills in business, marketing, business founding, digital mindset, and digital technology = 100% equivalent to BSC level 5.

Risk Issues	Significance to the PEA	Risk Reducing Measures	Results
Social and Environment			
1. Total losses management in the distribution system, the overall, is unable to achieve the set goal.	The COVID-19 pandemic affects electricity users' behavior and the country's economic alteration. The portion of small power users increases whilst the large power users decrease. Overall, the volume of the electricity consumption fall-off leading to a percentage of technical loss is higher. If PEA cannot control the total losses, it will directly affect the loss of revenue from the power distribution. To reduce the losses and increase the revenue, PEA needs to support the cost management from the power distribution to reach the goal.	• Analyze and plan for low-pressure distribution system by engaging the Software LDCAD to consider problems as well as develop the plan for the Expansion of electricity system to new household Project, 2nd Stage plan 4 to acquire the suitable technical work plan. • Determine the work plan of the organizational structure and job description to support the U-cube system. • Review procurement process, analyze the lesson learn of each year to prepare procurement plan for the next year and provide related seminars or workshops.	• The percentage of total losses = 5.45%, equivalent to BSC level 4. Since the COVID-19 situation in 2019 and lock-down measures, including the work from home measure encouragement, affect the enlargement of small power users. Still, the large power users are adversely affected, so the total losses increased.

Risk Issues	Significance to the PEA	Risk Reducing Measures	Results
2. The quality of low voltage does not meet the goal.	The crucial role of PEA is to provide stable electricity service to comply with the strategic objective (SO2), which aims to drive the organization to be excellent in electricity distribution. According to the complaints about the quality of low voltage from small power users continually, PEA gives the significance to better the low voltage quality, service, and electricity distribution to reach the set goal as well as to meet the stakeholders' expectations. Besides, to ensure PEA is able to achieve the operation goal by 2021.	• Construct and improve the efficiency of low voltage system. • Analyze and plan low voltage system by Software LDCAD to perceive the suitably technical plan. • Plan for the improved transformer assessment framework. If it is completed, there are not any complaints within the fixed time. • The work plan to determine voltage at the last meter of the improved transformer, complying with the standard.	• The completeness plan for the improved transformer assessment framework does not have any complaints within the fixed time = 100% equivalent to BSC level 5. In addition, there are no repeated complaints about the former transformer. • The completeness of the last farthest improved meter needs to meet the standard = 100% equivalent to BSC level 5.

Risk Issues	Significance to the PEA	Risk Reducing Measures	Results
3. Data Analytic has still not created added business value to the organization.	Regarding the database of the PEA's former customers to add value to the organization, it is done by cross-selling and up-selling with those customers embracing market expansion to a new group of customers. To proceed with these operations, PEA needs to prepare for various significant issues, such as appropriate organization's database determination, which will drive each crucial strategic point. Satisfaction surveys and the organization's data spreading are embraced for Data Analytics and database management orderly in a type of Structured Data. It needs to be ready for utilization purposes by Data analytics creation to ensure that PEA can utilize the benefits of data in order to add business value to the organization efficiently.	• Integration to produce the whole database in terms of data and available operation system.	• The completeness of the related plan = 100% equivalent to BSC level 5. • PEA determined data collection guidelines followed by value chain reviewing of the organization, which covered the defined pilot business issues.

Management of the 2021 Internal Risk Issues

Risk Issues	Barriers	Risk Reducing Measures	Results
1. Distributed Generation (DG) behavioral tracking for the Very Small Power Producer (VSPP) management to achieve the goal.	Governmental policies encourage and support VSPP in the electricity production of PEA; it needs to comply with the standard of the electricity distribution system of DG to elevate the operation quality of the electricity system in order to be stable, trustworthy, efficient, and sufficient which leads to the use of electricity efficiently. Moreover, it is propped with the structural utility system and industry transformation in the nearest future.	• Install Feeder Remote Terminal Unit (FRTU) and the communication system for VSPP, which connect with the PEA's electricity grid to bond with the Supervisory Control And Data Acquisition (SCADA)/ Document Management System (DMS) system. • Develop the delivering data system from the generator to PEA through the SCADA system to be able to track and assess. • Prepare the DATA CENTER of the electricity generator. Counsel with the Ministry of Energy to review guidelines/measures in the generator's electric quality inspection and build a shared understanding with the electricity generator.	• PEA could install the FRTU and connect to the SCADA of the VSPP in 2021, 423 sites from 459 sites.

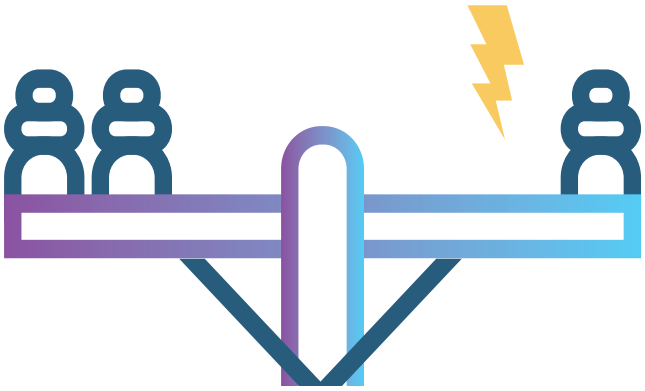
Risk Issues	Barriers	Risk Reducing Measures	Results
2. Meters for switching in case of deficiently since the Electronic Meters plan for the alteration of mechanical watt-hour meters not reaching the goal.	As the governor's policy, the delay of mechanical watt-hour meters replacement by electronics meters were found due to the delay of procurement for electronics meters. It will directly affect the image and the strategic objectives achieved of the organization 2 (SO2), which gives the significance in driving the excellent organization in the electricity distribution by integrating all systems of Digitalization. Therefore, PEA places importance on precipitation and closely tagging the mentioned plan to make the plan relevant to the Thailand smart grid master plan.	• PEA operates following the backup plan in case of the PEA electronics meters providing plan does not achieve the goal. • The operating Application PEA Smart Inventory Management Portal (SIMP) is planned for inventory management of meters (Pilot project).	• PEA was able to service meter installation for customers without impact. • PEA was able to use the Application PEA Smart Inventory Management Portal (SIMP) for planning, tracking, and managing the meter inventory efficiently.
3. The impacts of financial liquidity and the PEA's operation in case of a new wave of the COVID-19 pandemic.	The COVID-19 pandemic in 2020 has affected the financial liquidity and all operations resulting in the deadlock situation. Since the government's policies and measures include	• Discussed with the State Enterprise Policy Office (SEPO) for the installment of the public revenue. • The requested plan for the Electricity Generating Authority of Thailand (EGAT) to extend the settlement. of the cost of electricity purchasing.	• It was not affected financial liquidity. The annual cash balance of the fourth quarter of 2021 was higher than the set goal.

Risk Issues	Barriers	Risk Reducing Measures	Results
	lockdown or shut down in some specific areas together with the relief measures for residents by reducing the electricity bill, the PEA's financial liquidity issue has been the impact. Although the third quarter of 2020, the situation became better, the study of global COVID-19 spreading out found that Thailand could face a new pandemic wave. Thus, PEA considers the expected impacts from lessons learned from the first wave by meditating on the direct effects on PEA and stakeholders, reflecting the needs and expectations throughout the stakeholders' satisfaction.	• Discussion plan with three electricity organizations (EGAT, MEA, and PEA) to figure out the approaches that aim to mitigate affected of the government's relief measures for the electricity users and the electricity bill burden. • The plan for preparing the information system to support work from home. • The controlling plan on the increase of debtors and arrears. • The public relations plan or the Corporate Social Responsibility (CSR) to help the electricity households in case of shut down/ lockdown of a new pandemic wave by launching the PEA fight against COVID-19 project in 2021. • Reviewed the master plan for stakeholders' management for the year 2021-2025.	

Risk Management Training and Internal Control

PEA together with consultants had provided risk management training for management committees, i.e., workshops to search for and consider the risk factors of the organization level of 2021. The risk management and the subcommittee of the risk management division, and the secretary of the subcommittee of the risk management division participated in the seminar “Risk management/ Internal control” in the year 2021, which aimed to enhance awareness knowledge and risk management operation for the organization’s personnel to supervise the employees. Moreover, the organization had the operation assessment of the divisions of the deputy governor and the under the governor’s care through the issue and indicators of risk management and internal control.

In addition, PEA enhanced the knowingness and attentiveness of employees by conducting competition contests and rewards the excellent division in risk management in the year 2020. On 17 August 2021, PEA provided training such as the organization’s risk factors sharing and the division’s risk management plan development for 2022, etc.

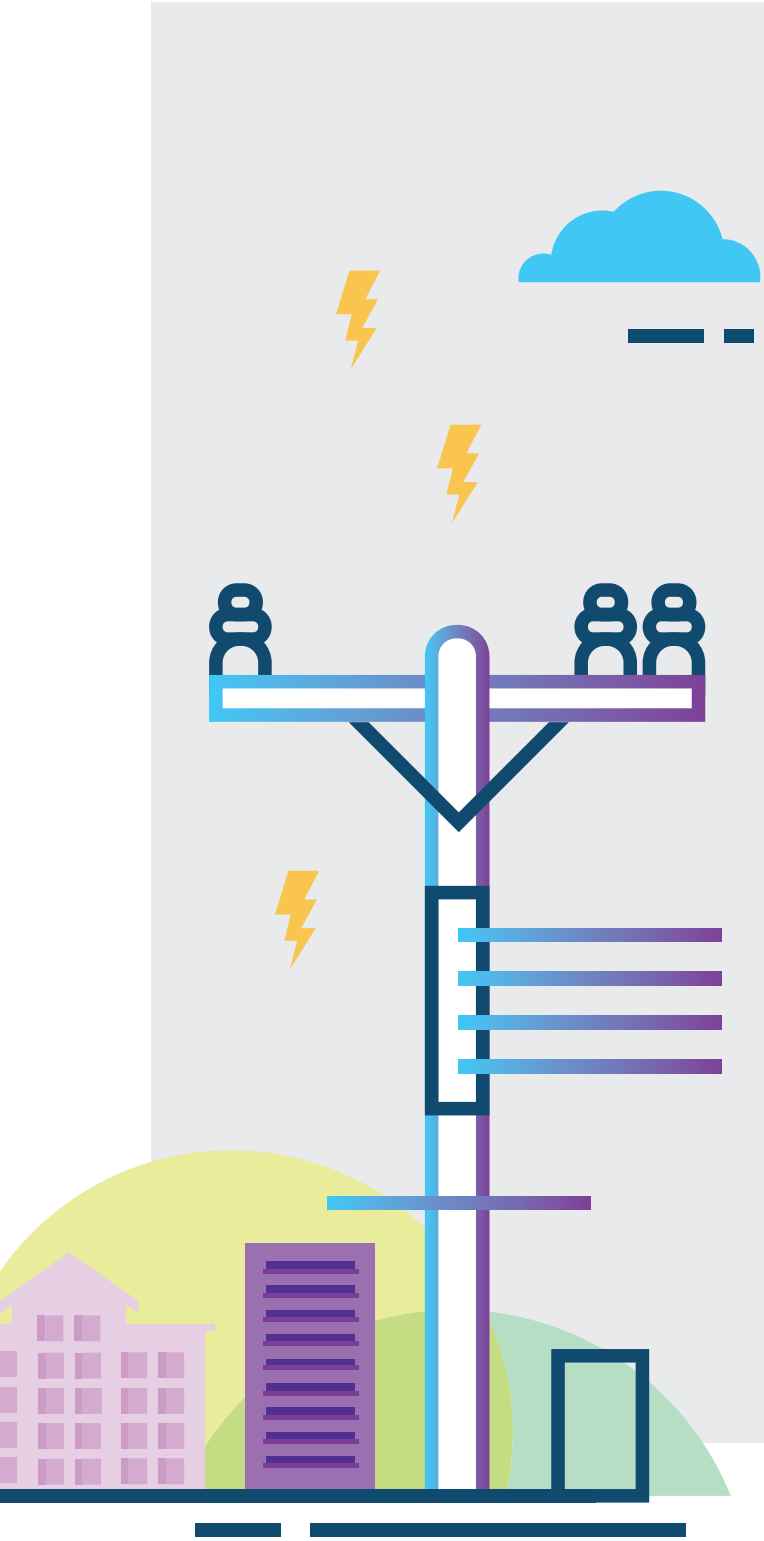


Improvement Plan for Future Operation

- Revise the risk plan for 2021 and select the Residual Risk to develop risk factors for 2022 and mitigation plan for the risks.
- Analyze risk management development and embrace the risk issues report to the policy and strategy determination committee.
- Prepare a more efficient Cyber Security plan for 2022.

Business Continuity Management and Emergency Management

Today, PEA operation is facing significant risks including the increasing demand of electricity consumption and stability of the system. Even though PEA has an efficient controlling system and risk management, some risks cannot be prevented, i.e., natural disasters or circumstances affecting the organization's reputation, etc. PEA needs to plan for the Business Continuity Management and Emergency Management.



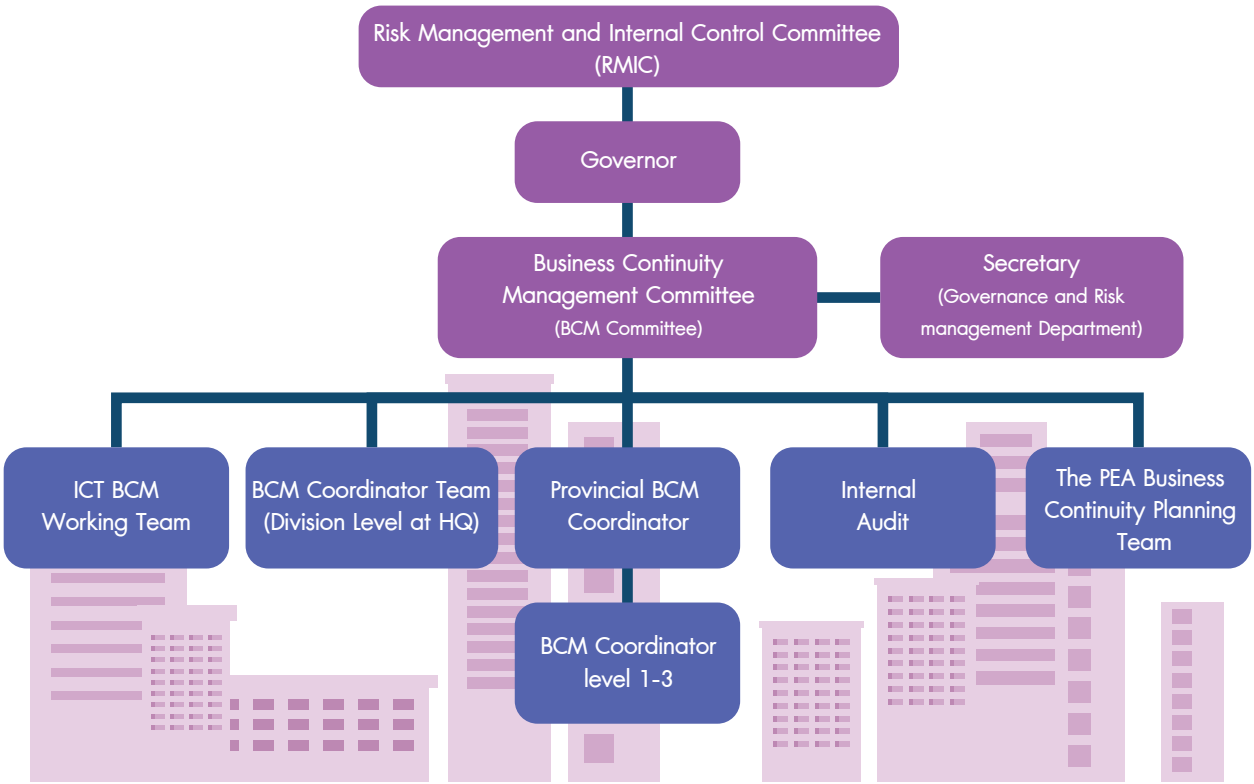
Targets

- To achieve the number of offices which operate Business Continuity Management System (BCMS management system) complies with ISO 22301: 2019 standards and practices on ERP and BCP plans.
- The duration of practice on the Emergency Response Plan: ERP and the continuity of BCP are on target.
- The duration of Recovery Time Objective (RTO) meets the target.

Strategies

- Prevent and lessen any occurring possibility of threat, preparedness to crisis responses, and be able to recover to normal operation in case of any business disruption.
- Continuity of the operations and electric energy service.
- Rapid recovery to normal operation in crisis event.

Business Continuity Management and Emergency



PEA nominates the Business Continuity Management Committee to function of:

1. Set up the Business Continuity Management Policy in line with the guidelines of the Energy Regulation Commission, the State Enterprise Policy Office, along with the Operation Risk Management Policy of the organization and present to the PEA governor to consider and approve.

2. Approve and identify the key mission and determine the target period in recovering strategy setting as well as consider the approval of BCP.

3. Specify the responsible person to operate BCP, prevention, and emergency response.

4. Present the operation plan and progress of the BCP, prevention, and emergency response to the PEA governor to acknowledge in case of any emergency circumstance.

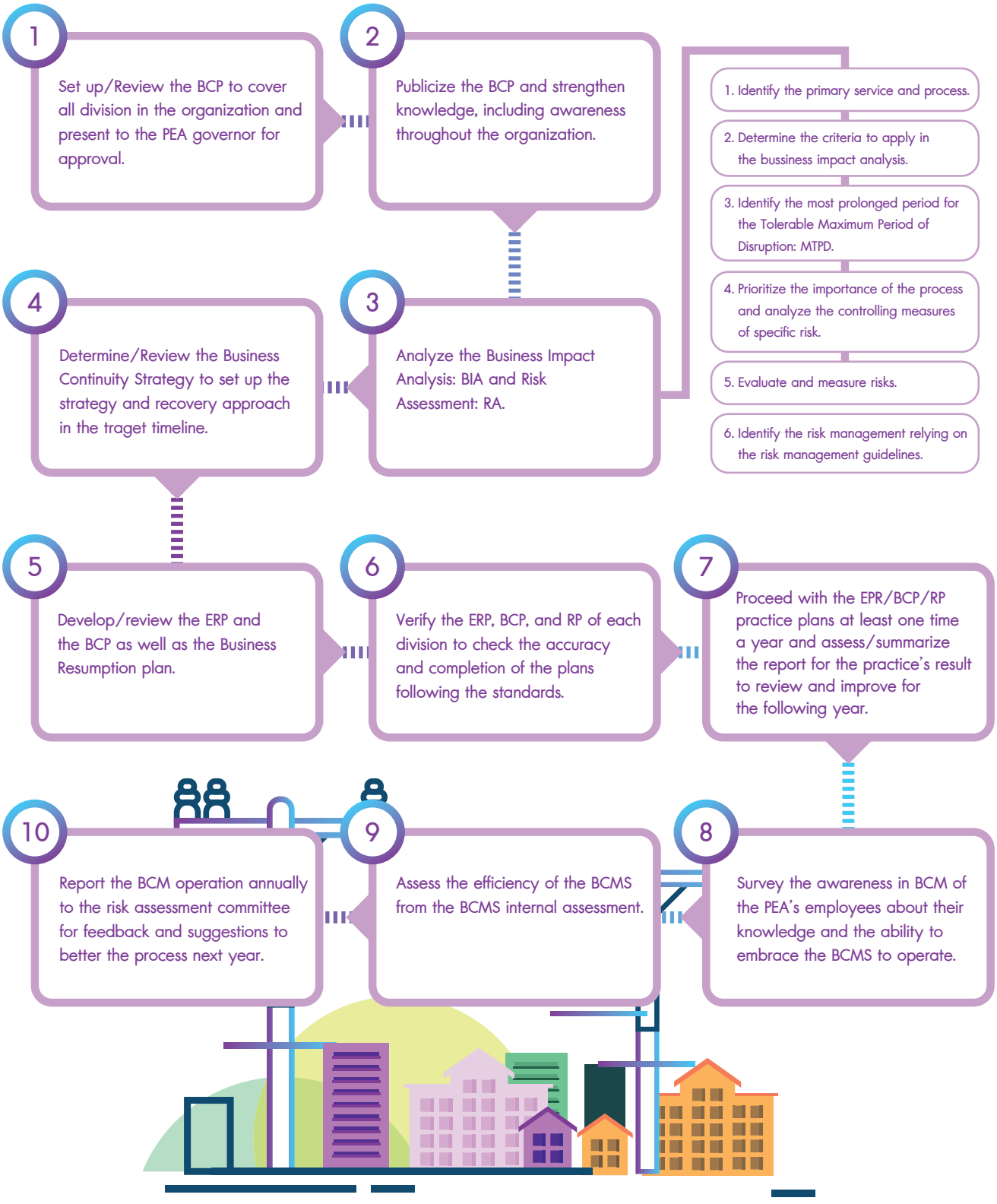
5. Determine the Business Continuity Management Policy guidelines and the BCP for employees to acknowledge.

6. Settle the publication and communication guidelines for emergency situations that might disrupt the operation and damage the organization's reputation for employees and outsiders to acknowledge during the crisis.

7. Inquire about the sub-committee appointment and determine the authority of sub-committees under the control of the BCM Committee for operating following the BCP and reaching the committee' s objectives.

8. Be authorized to invite a responsible person to clarify any requested further documents from relevant agencies to facilitate the committee' s operation as per the objectives.

The Business Continuity Management System: BCMS of PEA will follow the international standard ISO 22301: 2019 to manage the crisis management or disaster effectively and efficiently. PEA can respond to any circumstances and recover the Critical Business Process in proper timing as well as continue delivering the electricity service to users. Besides, it can mitigate the threat that impacts efficiency, and PEA has the BCMS as follows:



The Business Continuity Management System (BCMS) of PEA divided into handling phases as below:

Pre-crisis

The prevention and readiness for crisis

- All PEA agencies collect all history data of disaster and crisis and use to conduct the business impact analysis to forecast the risk possibility. (Low/High/Extreme)
- Develop crisis response plans. (ERP, BCP, RP, and communication plan during the crisis)
- Develop a tracking mechanism and notice in the crisis event.
- Assign responsible personnel to handle crisis management.
- Practice the BCP in a simulated situation.

Crisis

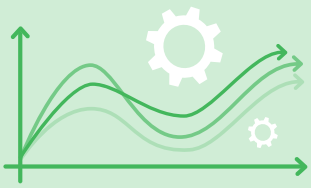
Crisis Management

- Manage the crises, track, and develop guidelines.
- Coordinate with external agencies to support the event.
- Communicate the measures to internal personnel and public.
- Adjust the approach to the actual situation.

Post-crisis

Continuity operations, recovery, and revise

- Operate the business continuity following the developed plan.
- Proceed to recover to the normal situation.
- Revise and assess the efficiency of related plans.
- Improve plan and the crisis management process.
- Communicate the plan to all related divisions to acknowledge and execu.

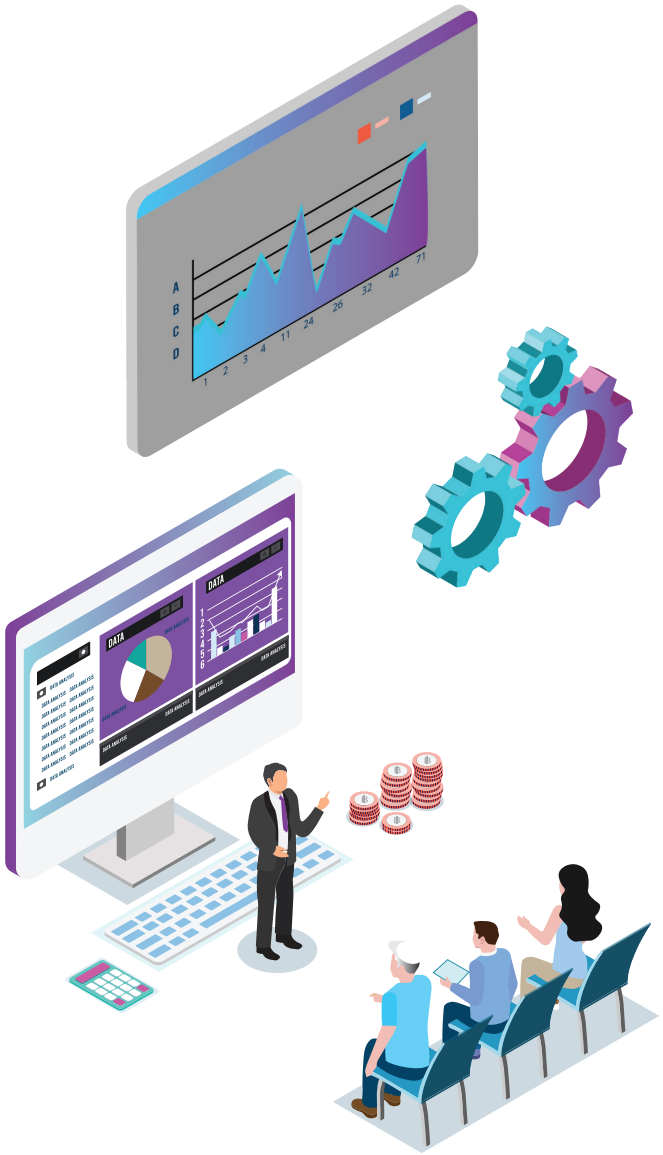


Risk Management Performances

	Processes	Performances
	PEA has extended the boundary of BCMS supported system regarding the ISO 22301: 2019 standards from 9 sites in 2022 to 25 sites in 2021. Moreover, PEA has preserved the guaranteed status by the external assessor for 3 consecutive years.	The number of agencies certified by ISO 22301: 2019 in total are 25 agencies.
	Improved the center for Resolution of Emergency Situation (CRES) of PEA to support the COVID-19 situation by emphasizing role and responsibility of the committees to make the internal operations seamless and lessen duplication. PEA also changed the center name to “The Emergency Administration Center in response to the situation of COVID-19 (CCSA.PEA.)”.	Roles and responsibility of committees of the COVID-19 Administration Center were emphasized.
	Improved, revised the risk assessment and adjusted measures to be agreeable with strategy, context, and current situation. Communicated with internal and external stakeholders such as public relations the customer service in the electronic channels to decrease on-site service across the country. PEA also reviewed procurement problems occurred during the COVID-19 pandemic and improves internal rules/ regulations to operate flexibly. Besides, PEA communicated the Business Continuity Management Policy to external parties through the website: www.pea.co.th and any emerging crisis occurred were also be communicated.	Reconsidered the risk issues of the organization annually and reported the operation results every quarter.

	Processes	Performances
	Developed the existing Intranet system to gather all information on BCMS, such as operation policy, practice results, training videos, etc. Moreover, this was a reporting channel for PEA's executives to acknowledge the ongoing operation and current threats of each operation specific area and divisions. This also allowed the executives or other responsible person to grant assistance in case of necessity and thus increasing a contacting channel for each PEA's agency through a chat box to support the problem-solving system or prompt response.	Developed the Intranet system to collect BCMS news and could respond to the treats without delay.
	Enlarged the communication channel to employees and external personnel related to BCMS, built awareness, and communicated employee regulations via a monthly newsletter, i.e., the guidelines of BCMS operated operation, work from home or COVID-19 regulations in case the employee get infectious, etc.	Awareness and BCMS embracement of employees increased 1.3% compared to the previous year.
	Every agency established the BCMS system following the ISO 22301 standard and ERP/BCP practicing plan. PEA aimed for every single agency to practice disaster management on the top Fourth situations which PEA mostly faced: COVID-19 pandemic, Cyber-attacks, flooding, and storms. The ERP/BCP practicing periods were in accordance with the specified recovery period of the RTO system. By 2021, 200 agencies achieved the practices.	Every agency had EPR and BCP practice plans; the previous year, 200 agencies participated in the practices.

	Processes	Performances
	Provide training about BCMS by inviting external party to educate employees and total employees attended the training were more than 2,065 persons. Besides, the pre-test and post-test knowledge assessment found that employees had greater comprehension post-training for 39.9%.	Employees had increased knowledge about the BCMS by 39.9%.

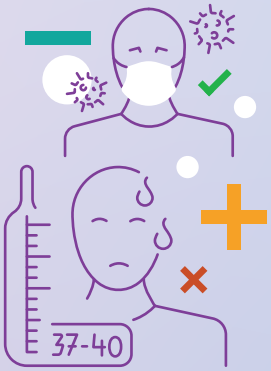


Improvement Plan for Future Operation

- Bettering the scope of activity/system to support the BCMS of PEA, for example, 1129 PEA Contact Center, Mobile Workforce Management System, One Touch Service System, and PEA MAP System, in order to enhance the scopes of the PEA's BCMS to be more comprehensive.
- Establishing the committee of standards and manual of the PEA BCMS by integrating the ISO 22301 standard to apply to the organization properly.
- Examining and improving the standards as well as the manual of the PEA BCMS for every agency can apply to operations efficiency.
- Provide training aiming to increase the internal auditor and to support the extension of the standard of the PEA BCMS.
- Expand the scope of the PEA BCMS standard to the PEA level 2-3 for 12 offices increasing from the 25 offices previously certified by the ISO 22301 standard.
- Proceeding the standards assessment of the PEA BCMS by the internal auditors of PEA and other assessment to assure that the operations are in line with ISO 22301 by five external auditors.

Present PEA's COVID-19 Response Measures

The Emergency Administration Center announced the measures and procedures to prevent and handle the spread of COVID-19.



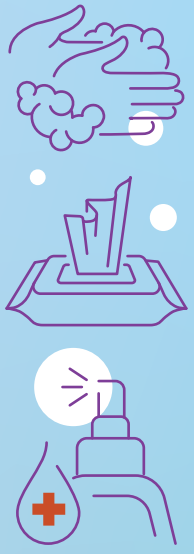
Set up the Emergency Administration Center in response to the situation of COVID-19 with the PEA Governor as the director.

CORONA

Set up working from home and overlapping work periods.

Employees were not allowed to join conferences or observe activities in countries with high risks, and overseas staff were not invited to join cooperation programs.

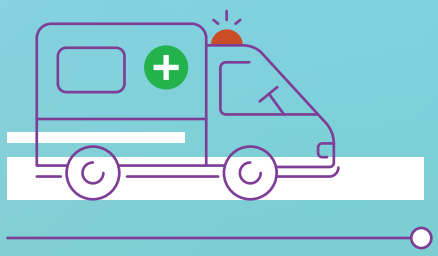
Decreased the number of meetings, canceled meetings, and avoided setting up activities and meetings which would gather crowds based on priorities; if a meeting was necessary, it should be conducted via the Unified Communication System (UC) using video conferencing.



Regularly cleaned and disinfected frequently used areas and service areas.

Set up points of risk assessment for employees, visitors, and the general public who may ask for services as well as set up measures for social distancing.

VIRUS



Planned and practiced ERP and BCP to cope with the spread of COVID-19.

Used the LINE PEA COVID-19 application so the employees could assess their health and their risks of COVID-19 infection every day and to record the time of work, which aided the work-from-home practice.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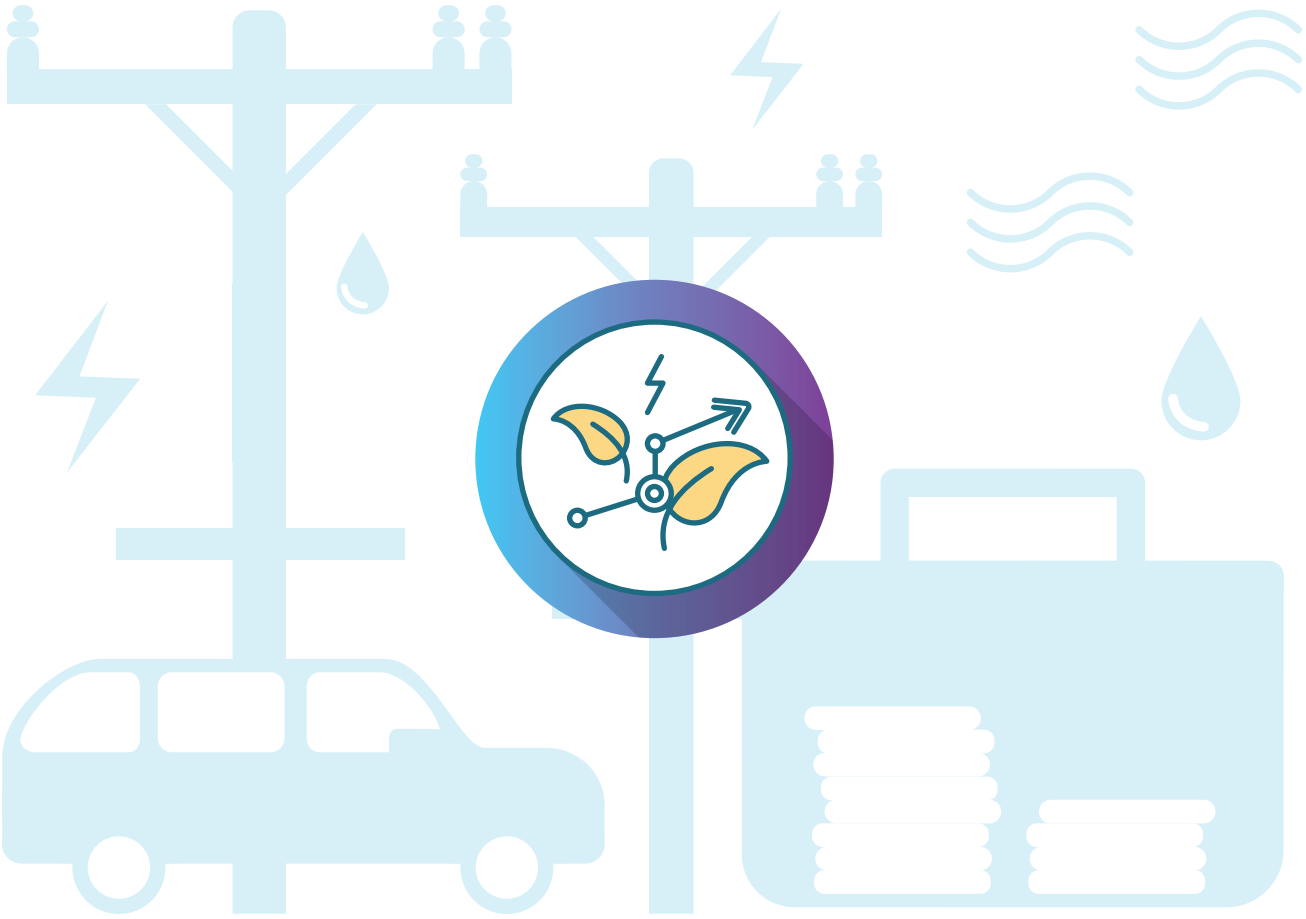
08

ORGANIZATIONAL DEVELOPMENT TOWARDS SUSTAINABILITY



The PEA recognizes the importance of being a sustainable organization. Therefore, PEA strives to drive the organization to be balanced in economic, social, and environmental dimensions as well as build confidence in people that they will receive excellent services under the sustainable development strategy. Moreover, PEA has adopted the guidelines of the international standard according to Social Responsibility (ISO 26000) and Sustainable Development Goals (SDGs) to be the framework for formulating Social and Environmental Responsibility Policy and also formulating a master plan for sustainable development. The process of drafting a master plan has focused on analyzing the sustainability context which is relevant both within and outside the organization. Moreover, providing opportunities for stakeholders to participate in opinion expression in order to use their aforementioned opinions as inputs to formulate sustainability development strategies and transfer them to operational levels in a hierarchical way. While the board and top management have a role and participate in every process in accordance with the sustainability management structure.

Sustainability Management Structure (2-23, 2-24)

Policy Level

Good Corporate Governance and Corporate Social Responsibility Committee
formulates strategic policies, goals, and provides commentary.

Executive Level

Senior Management
considers various sustainability factors when creating strategic plans, setting indicators, tracking performance, making comments/recommendations for solving problems, reviewing plans and filtering information down to operational level.

Operational Level

Sub-Committee/ Working Groups/ Responsible Sectors
survey stakeholder needs/expectations, research relevant information, work on various issues and report to senior management

Strategic Objective (2-23, 2-24)

The PEA has reviewed the PEA Strategic Plan 2021 - 2025 with an emphasis on being a leading regional electricity utility. PEA also strives to provide comprehensive, efficient, reliable electricity services and fully integrated related business in order to develop the quality of life, sustainability of economics and society as well as determining 5 strategic objectives as below.

Strategic Objective 1 (SO1): Sustainability and Good Governance

Emphasize on analysis and determination of driving factors in pursuit of internal sustainability underlined by international best practices such as ISO 26000, United Nations Sustainable Development Goals (UN SDGs), The Down Jones Sustainability Indices (DJSI) as well as the evaluation assessment of the State Enterprise Policy Office (SEPO). The purpose is to achieve goals in 3 dimensions which are economic, social and environmental. It aims to acquire the "Social License to Operate" to promote the organization's activities of social, community, and environmental responsibilities. The focuses are also on internal work for transparency in all PEA Offices and the improvement of the standards for safety and occupational health of the employees.

Strategic Objective 2 (SO2): Excellent Organization in the Future Energy System

Raise power system standard at leading level in the region and continually improve distribution system to ensure its stability, safety, and availability for all current service areas and to accommodate the expansion of economic zones as well as strategic areas of the country. It also values the application of modern technology to the grid system and develops asset management system to optimize asset utilization, raise efficiency and operation, reduce operating and maintenance cost and increase in financial return by properly operating the asset management roadmap and maintenance strategy. In addition, the emphasis is also placed on the streamlining of work process with digital technology for greater flexibility, speed, and better satisfaction of customers' demands and expectations.

Strategic Objective 3 (SO3): Customer Focused

Enhance customer service quality with the use of digital technology and Voice of Customers (VOC). PEA focuses on developing digital CRM, a key system for managing an integrated database leading to application in planning products and services, marketing, work system & work process improvement, development of new business opportunities, and proper relationship-building with each customer group covering current, former, and competing customers as well as customers with future potential. Additionally, it also includes the development of standardized products and services according to the World Bank's Doing Business guidelines and responses to the demands and expectations of each customer group, which consists of small-scale customers (residential and small-scale commercial customers), large-scale customers (industrial and large scale commercial customers), and government sector and others. Moreover, focusing on creating relationships with customers sustainably.

Strategic Objective 4 (SO4): Towards a Non-regulated Business by Creating an Advantaged Portfolio

Expand related businesses in response to electricity industry restructuring and technology disruption resulting in the decrease of current income from core business, which is the electric power distribution. However, PEA's core competency and the organization's resources create opportunities and advantages over other businesses such as the electricity service for industrial customers, energy management business, solar rooftops, electrical system design consultant, etc. PEA's related businesses are carried out in the form of providing additional services related to its core business such as investing in renewable energy businesses both inside and outside Thailand. These businesses enhance business growth potential and the proper rate of return for PEA including supplementary and new businesses which could be developed by PEA or in collaboration with PEA ENCOM International Company Limited and future affiliated companies in both public and private sectors which could play a vital role in developing renewable energy (Green Energy) and encouraging the energy efficiency (Energy Saving).

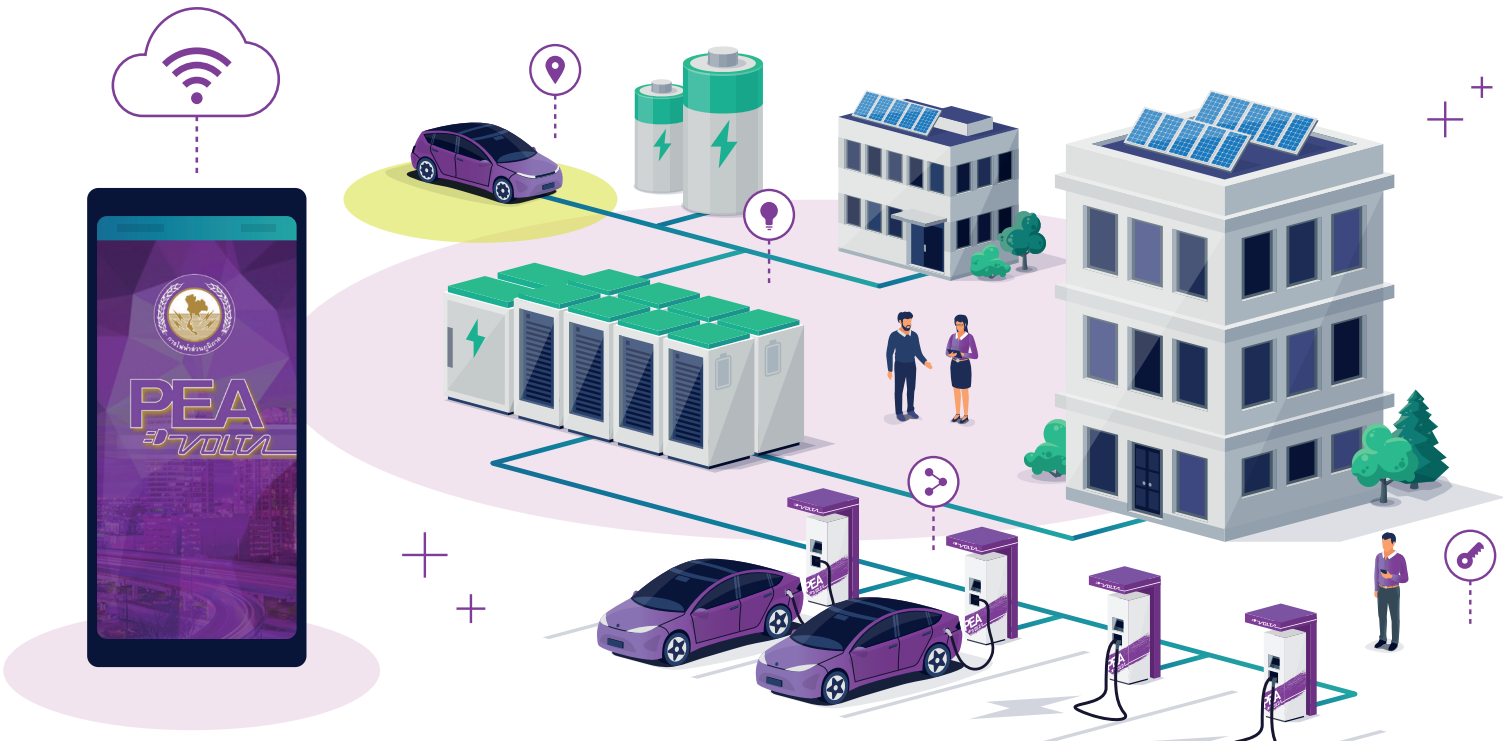
Strategic Objective 5 (SO5): Enabler for Development and Growth

Driving the organization with human capital, digital technology and innovation which are detailing as follows:

Human capital focuses on strategic human resource management (HRM) and human resource development (HRD) in order to enhance personnel's competency and caliber for core and future downstream businesses. This also implies personnel development to sustain dynamic changes in technology and dynamic transformation of the power industry.

Digital technology focuses on supporting the organization to transform into digital utility by focusing on 3 dimensions namely Digital Service to increase customer service efficiency, Digital Operational Excellence to improve operational efficiency and productivity, and Digital Business to increase the efficiency of current products and services and lead to innovative design of such products and services, together with potentially new platforms and business models.

Innovation focuses on enabling systematic organizational innovation management through an innovation process concerning products, services, organizational processes, business models, and other innovations designed to raise business efficiency and forge sustainability of profitability for core businesses. It also includes innovations that meet customers' demands or represent related marketing opportunities for PEA.



Response to United Nations Sustainable Development Goals (UN SDGs)

	S01	S02
Goals	Enhance Integrated Governance to create sustainability	Aim to be an excellent organization in all aspects to support future power systems
UN SDGs related		
Strategic	S1 Enable PEA growth sustainably in accordance with the SDGs framework and international best practices, OECD and DJSI. S2 Focus on and respond to stakeholder groups.	S3 Regional-leading quality distribution system. S4 Grid modernization roadmap & implementation. S5 Integration of work processes throughout the organization by digitalization to increase competitiveness. S6 Build long-term financial stability.
Example plans for 2021	1. Integrity and Transparency Assessment (ITA) improvement plan. 2. Occupational and workplace safety management plan. 3. Corporate governance and leadership enhancement plan (comply with State Enterprise Assessment Model: SE-AM). 4. Sustainability of social and environmental responsibility enhancing plan. 5. Improved and integrated stakeholder engagement plan.	1. Strong Grid development plan. 2. Smart Grid project. 3. Information and communication technology development plan (as to assist Smart Grid system). 4. Third Party Access (TPA) service development plan. 5. Billing procedure improvement plan. 6. Streamline business processes management plan. 7. PEA's asset management improvement plan. 8. Sensible and sufficient long-term financing plan.

S03

Focus on meeting the demands of all customer groups

- S7 Enhance customer services quality.
- S8 Build relationships and maintain key customers base (Key Account).

1. Digitalization of service-level agreement plan (as to exceeds customers/ peer expectations of service quality).
2. Digitalization of customer care and service plan (ex. PEA Smart Plus Application).
3. Key account customer management and customer relationship management (CRM) plan.

S04

Focus towards Non – Regulated business by creating Advantaged Portfolio

- S9 Strategic direction determination between PEA and its affiliates.
- S10 Implementation of related-business plans and product portfolio management.
- S11 Supervising and monitoring the operations of affiliated companies.
- S12 Improving the relevant regulations to be more agile and competitive.

1. Business model and business portfolio management plan between PEA and affiliated companies.
2. Business portfolio implementation plan.
3. Supervision and monitoring plan for PEA's affiliated companies.
4. Revision of laws, legislations and regulations plan to facilitate work/ business process continuity.

S05

Drive the organization to be modern with human capital, digital technology and innovation

- S13 Enhance the management and development of human capital.
- S14 Advocate and develop capability through digital technology to drive the organizations efficiently (Digital Transformation).
- S15 Strengthen the security and stability of digital technology (Sustainable and Secured Digital Technology).
- S16 Developing Corporate Innovation System (CIS).

1. Workforce management plan (for transforming into a digital utility).
2. Digitalization of human capital management and human capital development plan.
3. Digital platform development plan.
4. Corporate governance of information technology development plan.
5. Information security system development plan.
6. Innovation management system development plan.

SO1: Enhance integrated governance to create sustainability

- Gained ITA score = 95.24 points, which is the number 1 of state-owned enterprises in the energy and utility sector and number 5 In among all state enterprises that are assessed (Based on a target of 75 - 89.99 points (level B - A) or has a rating of 1 in 2 of the state-owned enterprises in the energy sector.
- The success of reviewing the stakeholder management master plan to be the framework for the preparation of the annual action plan (relationship-building plan) was at 100 (from the target of 95 percent).
- The success of the plan to upgrade PEA's safety operations to be the Occupational Health and Safety Management System (TIS no. 45001) was at 100 % (from the target of 95%).
- The success of the plan for raising social and environmental operations to meet the international standards was at 100% (from the target of 95 percent).
- The result of the satisfaction survey of PEA operation that responds to the expectations of stakeholders was at level 4.20 (from the target of level 3.80).
- The number of units (kWh) that save office electricity was at 109.32 million units from the target of 95 million units.
- Achieved the Core Business Enablers Assessment, dimension 1: good governance and the leading of the organization at 3.27 points (self-assessment score 26 October 2021) (from the target of 2.50 points), which was an increase from 2020 (at 3.05 points). It is expected that the SEPO will evaluate the actual score within May 2022.

SO2: Aim to be an excellent organization in all aspects to support future power systems

- The System Average Interruption Frequency Index (SAIFI) was 2.19 from the target of 2.45 time/person/year.
- The System Average Interruption Duration Index (SAIDI) was 44.51 from the target of 51.16 minutes/person/year.
- Percentage of loss units in the distribution system was 5.45 from a target of 5.44.
- The success of the technology and communication development to support the development of smart grids (install optical fiber cable/develop IP Access Network) was at 90 percent (from the target of 95 percent).
- Appointed the operating group for the innovation testing project that uses technology to support energy services (Energy Regulatory Commission Sandbox: ERC Sandbox) which were operated in the experimental area.
- Developed a system of “Meter Reading Management (MRM)” and applied to all 12 districts across the country. The operation result of this project found that the error rate was lower than the determined threshold.
- Every division conducted a process efficiency improvement plan to reduce the step, time and cost of operation.
- The success of the long-term finding funds that were sufficient and had the reasonable costs was at 100 percent (from target = 95 percent).
- The success of the asset management system development plan was at 90 percent (from target = 90 percent), with had overall performance as follows:
  - Conducted the online lesson plan to develop the competence of each person.
  - Conducted data cleansing and improve information system for asset management.
  - Adopted Enterprise Asset Management (EAM) Software.
  - Calculated the actual cost per unit over its lifetime for important assets in order to assess the worthiness in term of economic aspect.

SO3: Focus on meeting the demands of all customer groups

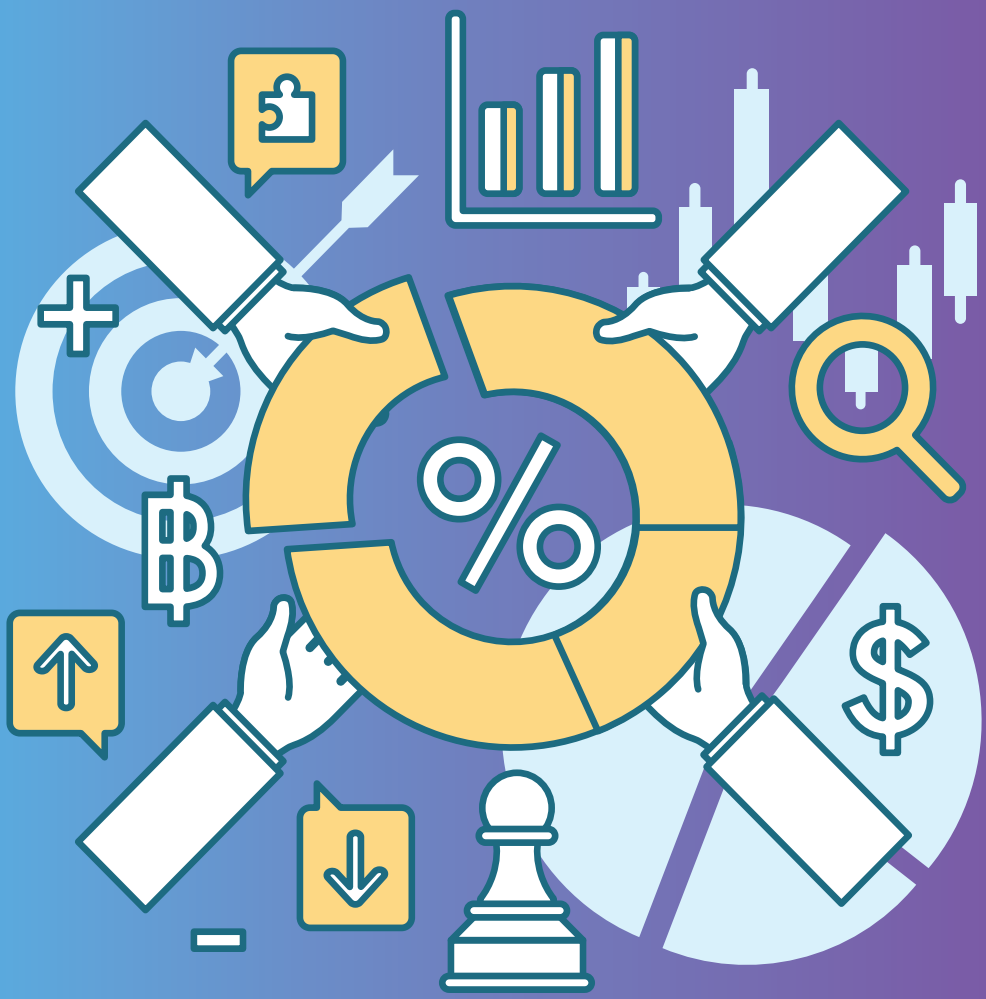
- Customer satisfaction result was at 4.43 level (from the target at 4.42 level).
- High-Value Customer (Key Account) satisfaction result was at 4.43 level (from the target at 4.35 level).
- Developed customer service standards through digital technology (Digital Service), such as the project to install “Tan Jai” meters with the regional electricity, add more payment channels through True Wallet.
- Developed applications to maintain key customer base (PEA Privilege application) and CRM Mobile Workforce Management system to support customer service.

SO4: Focus towards non - regulated business by creating advantaged portfolio

- Prepared business portfolio and strategic plans of the PEA and its affiliates as well as monitoring performance quarterly.
- The success of the execution of relevant business plans was at 100 percent (from the target of 95 percent) and had a related business income of 7,030.44 million baht (from the target of 6,150 million baht), which increased 10.67 percent compared to the previous year.

SO5: Drive the organization to be modern with human capital, digital technology and innovation

- Enhanced the management and development of human capital. There are important operations as follows:
  - HR Analytics: generated the workshop with NECTEC consultants to build digital technology skills and creative skills for innovation development and exchange ideas.
  - Employee Development profile: developed courses that were suitable for the career path plan, provided training and created individual development plans on the HRDP system.
  - There was a PEATA system, which was a system that allowed employees to assess their own performance in various aspects, in order to use assessment results for improvement in their work processes further.
  - Developed employee self-service through PEA Life Application by developing features such as a feature to notify important corporate information, shuttle bus feature, loan welfare feature and savings cooperative features, etc.
- Prepared a manpower plan that corresponds to the current situation and future trends.
- 100 percent success in the project that develops integrated internet services (PEA Smart Plus) on Smart Phone (from the target of 95 percent).
- There was the examination, repairing and maintenance of the optical fiber cable network 24 hours.
- Communicated and raised awareness regarding IT Governance by communicating via Facebook page of the digital office and training through the E-learning system in order to communicate and raise awareness regarding ITG operations. The assessment result according to the evaluation criteria of all 17 departments/ offices showed that there were 15 departments/ offices had passed the criteria level 5, 1 department/ office had passed the criteria level 4, and another 1 department/office had passed the criteria level 2.
- The success of the Technology Digital Security System Development Plan in accordance with ISO/ IEC 27001 was at 100% (from the target of 95%).
- The success in implementation of the Corporate Innovation System development plan was at 100% (from the target of 95%).



STAKEHOLDER ENGAGEMENT (2-29, 3-3)

The PEA has a mission to provide electric power and related business services to meet the demands of customers in order to achieve satisfaction both in terms of quality and service under the determination to drive the business in the way of growing sustainably and create advancement in every society and community that the company operates nearby. PEA has paid the attention to all groups of stakeholders and supported participatory operations to lead the development of positive relationships, generate reliability and create shared values between stakeholders and PEA with the following operational guidelines:

1. PEA stakeholders are a person or a group who are affected by or have effect on PEA's business operations according to key work systems.

2. Treat all stakeholders under the principles of good corporate governance of PEA and adhere to the practice of being a good citizen for the society according to the social responsibility standard (ISO 26000).

3. Define strategies and plans to build systematic stakeholder relationships in accordance with the AA1000 Stakeholder Engagement Standard (AA1000SES).

4. Provide opportunities for stakeholders to participate in the topics that affect stakeholders by providing channels for receiving suggestions, problems and complaints in order to acknowledge their opinions, expectations and demands clearly.

5. Monitor and evaluate the performance and also disclose information accurately, transparently, and comprehensively in order to ensure that information is adequate, consistent and up to date.

In this regard, PEA has a process for selecting and identifying stakeholder groups by using the AA1000 Stakeholder Engagement Standard along with analyzing the organization's master plans to consider which stakeholder groups are involved. The process identified are as follows:

1. Analyze stakeholders from the various master plans of the organization.

2. Identify all stakeholders of each department based on the value chain by categorizing them into internal and external stakeholders in each process activity performed by the department.

3. Prioritize stakeholders according to the ranking principle that covers 2 aspects as follows:

3.1 Influence dimension (Impact)

This is to consider the dimensions of the PEA being affected by the operations of the stakeholders, such as formulating policy/ direction of the regulatory agency that affects the strategy/ operation of PEA. Also, areas of budget/ resource framework, such as people, time, and skill. Moreover, there is still obstruction of work/ accessibility to the working area of the PEA, such as community/ community leaders against the operation of the PEA to install the poles, cables, underground electric cables and any negative mentions that would affect PEA reputation as follows:

I1 Have the power to order/ change policies/ directions of operations/ plans/ methods or processes of work.

I2 Have the authority to approve/ change the budget/ resources used in the work.

I3 Able to hinder working/ accessibility in the working area.

I4 Able to take action that affects reputation.

3.2. Stakeholder dimension (Dependency)

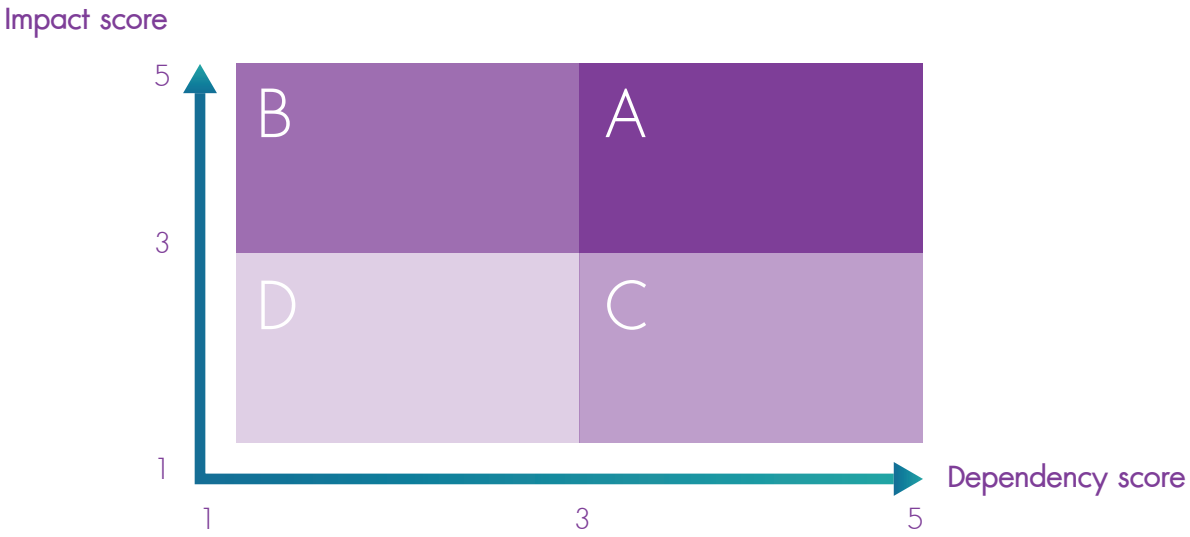
This is to consider the dimensions of how those stakeholders are affected or how they have a stake in the PEA's operations, such as the implementation according to indicators will have some agencies that are affected or have a stake in the operations of others related agencies or some stakeholders are affected by financial performance or delivery of poor-quality products/ services, which customers/ users would directly be impacted by the operations of the PEA as follows:

D1 have a stake in daily work/ operation in accordance with indicators

D2 have a stake in the financial performance that may increases or decreases.

D3 be negatively affected by the product or service.

When analyzing the level of importance of stakeholder groups, it will be considered through the matrix format.



The priority consideration will consider only the groups of stakeholders located in Zone A-C only (A = very significant, B = moderately significant and C = Low significant). After each line of work has analyzed the data and prioritized the importance of stakeholders, there will be workshops for every line of work in order to review the identification of key stakeholders in each line of work as well as re-analyze to ensure that such analysis and prioritization are comprehensive and complete in the context of the operations of each working line at the departmental level. Key stakeholders can be summarized in each line of work, all 14 lines, 2 offices, and departments directly under the Governor.

As the aforementioned process, as a result, PEA is able to identify stakeholder groups as follows: 1) regulators and government agencies, 2) customers, 3) community, society and environment, 4) media, 5) partners, 6) board of directors, 7) employees/ internal departments, 8) affiliates, and 9) peers/ competitors.

Stakeholder Engagement (2-29, 3-3)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/ Expectations	Operations to meet stakeholder needs/ expectations
Regulators and Government Agencies	• Organize interviews with regulatory and government agencies to hear their opinions, suggestions, and demands once a year. (In-depth Interview) • Organize a meeting to hear the opinions of regulators and government agencies on the PEA's strategic plan once a year. • Survey the satisfaction of regulators and the government agencies on the PEA's operation once a year.	• Developing electrical system quality and providing service continuously • Cooperation in operations. (Preparation of documents and permission to enter the area, relocation of electricity distribution grid, traffic facilitation in case of maintenance) • Compliance with established guidelines and laws as well as conducting business with transparency • Developing the operation with digital technology • Speed of contact or coordination with government agencies • Proactive troubleshooting of electrical system problems to reduce the complaints of users	• Corporate Governance and Anti-Corruption. (Page 37-53) • Trends and direction of business change. (Page 55-57) • Power system reliability management. (Page 107-113) • Equitable treatment of personnel. (Page 135) • Cyber Security. (Page 114-129) • Customer privacy. (Page 148-154)
Customers	• Listen to customers' voices in a variety of channels, including: - 37,932 voices from 1129 PEA Call Center - 5,470 voices from PEA Website - 4,820 voices from PEA Smart Plus Application - 407 voices from Office of the Permanent Secretary, The Prime Minister, OPM/ State Audit Office of the Kingdom of Thailand,	• The quality of power • Power outages as in the plan • Power failure correction • Standards/ Safety • Electricity utilization/ request for electricity and services • Improvement/ maintenance of electrical systems • Recording units/ electricity bill notification • Abstaining electricity supply/ reset meter back • Electricity payment	• Power system reliability management. (Page 107-113) • Consideration regarding health and safety of customers. (Page 148-154) • Improving the quality of life through the accessibility of electricity. (Page 154-156) • Cyber Security. (Page 114-129)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
	SAO/ National Anti-Corruption Commission, NACC/ Office of Public Sector Anti-Corruption Commission, PACC. - 117 voices from Electricity Authority Office. - 115 voices from Governor/ Electricity Authority Office sector 1-4. - 54 voices from sending through other agencies. - 38 voices from PEA-VCare. - 23 voices from Damrongtham center. • Organize a meeting to listen to the opinions of customers and users regarding the PEA's strategic plan once a year. • Survey the satisfaction of customers and users on the PEA's operation once a year.	• Customer supporting channels. • Suggestion/ consulting customers.	• Customer privacy. (Page 148-154)
Community, Society and Environment	• Visit the community to listen their opinions, suggestion and the community's needs once a year. • Organize a meeting to listen to the opinions of the community, society, and the environment on the strategic plan of the PEA once a year. • Survey the satisfaction of the community, society, and the environment on the PEA's operation once a year.	• Accident/Fire Prevention from the electrical distribution system and provide knowledge on using the PEA services or the use of electricity parsimoniously and safely for the community. • Adjusting the scenery on the electric grid for the safety of society, such as organizing the communication lines, bringing power cables underground.	• Consideration regarding health and safety of customers. (Page 148-153) • Improving the quality of life through the accessibility of electricity. (Page 154-156) • Equitable treatment of personnel. (Page 135-139)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
		• Access to electricity by remote communities. • Supporting for community development projects around local PEA office in order to promote community relations between the PEA and community (advocating careers for people). • Facilitation in the terms of procedures and documents in operation. • Providing fair, non-discriminatory services and comprehensive to all. • Supporting alternative energy consumption. • Communication channels that are convenient and easy to access and beneficial to society. • Applying technology in operations.	
Media	• Develop a survey to listen to the media's opinions, suggestions, and need once a year. • Organize a meeting to listen to the media's opinions on the PEA's strategic plan once a year. • Survey the satisfaction of media on the PEA's operation once a year.	• Public relations for the media to acknowledge PEA's assistance projects for various types of users. • Media cooperatives. • PEA employees are unable to communicate in the case of PEA head office has the technology event that is interesting to media such as PUPAPLUG. • Communication of useful information, such as corporate, whole society, and people assistance.	• Risk management throughout the organization. (Page 59-70)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
		• Pay attention to local media and news content. • Creating channels to inform news related to electricity. • Desire to present the information of PEA that is accurate and complete. • No spokesperson for the district office to report the press release in case of crisis event. • Lack of public relations, this causes the media does not know the PEA's assistance project for various types of users. • There is a presentation of PEA's information that is inaccurate.	
Partners	• Organize a meeting to listen to partner's opinions, suggestions, and need once a year. • Organize a meeting to listen to partners' opinions on the PEA's strategic plan once a year. • Survey the satisfaction of partners on the PEA's operation once a year.	• Coordination to create safety at work. • Duration of power outage and load transfer as planned. • Facilitating quickly in the terms of communication and coordination. • Prompt, complete, accurate and clear exchange of information. • Organizing discussion activity between PEA and partners to strengthen good relationships and to develop national electrical stability. • SPP transmission line development. • Information notification regarding the technical details	• Risk management throughout the organization. (Page 59-70) • Power system reliability management. (Page 107-113) • Occupational health and safety at work. (Page 140-147)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
		of the power outage delays affecting management. • Steadiness and stability in the electrical transmission. • Prompt electricity purchase process. • Increasing the opening of the expansion of the electricity sales contract. • Determining the proper middle-price.	
Board of Directors	• Organize a meeting to listen to the board's opinions, suggestions, and need once a year. • Organize a meeting to listen to the board's opinions on the PEA's strategic plan once a year. • Survey the satisfaction of the board on the PEA's operation once a year.	• Organization development to handle with the change. • Serving people with transparency, ethics and verifiable. • Stability and sustainability in conducting country's electricity business.	• Corporate Governance and Anti-Corruption. (Page 37-53) • Trends and direction of business changes. (Page 55-57) • Economic performance. (Page 126-134)
Employees/Internal department	• Executives meet employees. (meeting/ visiting/ participation in activities) 1 time/ a week. • Governors meeting employee program once per quarter. • PEA Executive meeting with each PEA's function once a month. • Announcing policy on management and organizational development of the Governor once a quarter.	• Working environment that support to work including communication in the management and various changes of the organization continuously and rapidly. • Clarity of duty and power according to responsibility and a balance between life and work as well as opportunities for career advancement. • Salary, compensation, welfares and benefits for personnel.	• Equitable treatment of personnel. (Page 135-139)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
	• Annual strategic plan seminar by senior management. • Seminar on clarification of the annual strategic plan by PEA executives. • Meeting to communicate the strategic plan/ review annual action plan of functions. • Survey the satisfaction of the employee/ Internal department on the PEA's operation once a year.		
Affiliates	• Organize a meeting to listen to the board's opinions, suggestions, and need once a year. • Organize a meeting to listen to the board's opinions on the PEA's strategic plan once a year. • Survey the satisfaction of the board on the PEA's operation once a year.	• Paying attention to affiliated companies, creating value of affiliated companies and enhancing stability, performance and financial status of affiliated companies as well as reducing the risk that occur from inside and outside the organization. In addition, there should be supervision. • Providing cooperation to each other and collaborate to push and develop better affiliated companies. • Coordination promptly and thoroughly as well as thorough study. • Complete the work according to the action plan.	• Risk management throughout the organization. (Page 59-70) • Economic performance. (Page 126-134)

Stakeholders	Stakeholder Engagement Guidelines and Frequency	Stakeholder Needs/Expectations	Operations to meet stakeholder needs/ expectations
		• Seriously support policy work and advocate value-added business drive to create an investment arm for PEA. • Having a clear plan for affiliated companies. • Having a good perspective of the affiliates. • Supporting, providing advice and helping as the affiliated companies request.	
Peers/ Competitors	• Organize a meeting to listen to peers/ competitor's opinions on their needs/ expectations once a year. • Organize a meeting to listen to peers/ competitor's opinions on the PEA's strategic plan 1 time. • Survey the satisfaction of peers/ competitors on the PEA's operation once a year.	• Providing joint project to develop technology in order to create stability in the electrical system. • Coordination of employees at the PEA office related to SPP. • Trading between organizations.	• Power system reliability management. (Page 107-113) • Economic performance. (Page 126-134)
			

ASSESSMENT OF MATERIAL SUSTAINABLE DEVELOPMENT TOPIC (3-1)

The PEA has prepared this report to disclose its performance in the terms of economic, social and environmental dimensions that are significant to PEA and stakeholders by considering sustainability materiality from internal and external factors in accordance with the principles of Global Reporting Initiatives (GRI) through three stages of evaluating key sustainability materiality as follows:

1. Study, review and identify relevant sustainability topics

PEA has studied, analyzed and identified sustainability topics related to the business, which covers economic, social and environmental dimensions in order to be initial information in the process of conducting the sustainability report 2021. In this process, there is the step of identifying sustainability issues related to the business that consists of:

- Studying the international sustainability principle and guidelines.
- Comparison of past performance with the Sustainable Development Goals (SDGs Goals).
- Analysis of stakeholder demands and expectations.
- Studying the information on the electricity business group according to the G4 International Reporting Framework. (GRI G4 Electric Utilities Sector Disclosure)
- Reviewing the sustainability topics in 2020 of PEA.

2. Prioritization of the sustainability topics

After PEA has identified relevant sustainability topics from the first step, the relevant topics are then prioritized. Lastly, there are a total of 11 significant sustainability topics were identified by using the following criteria:

- The impacts of organizations on economic, social, and environmental dimensions.
- The importance of assessment and decision by stakeholders.

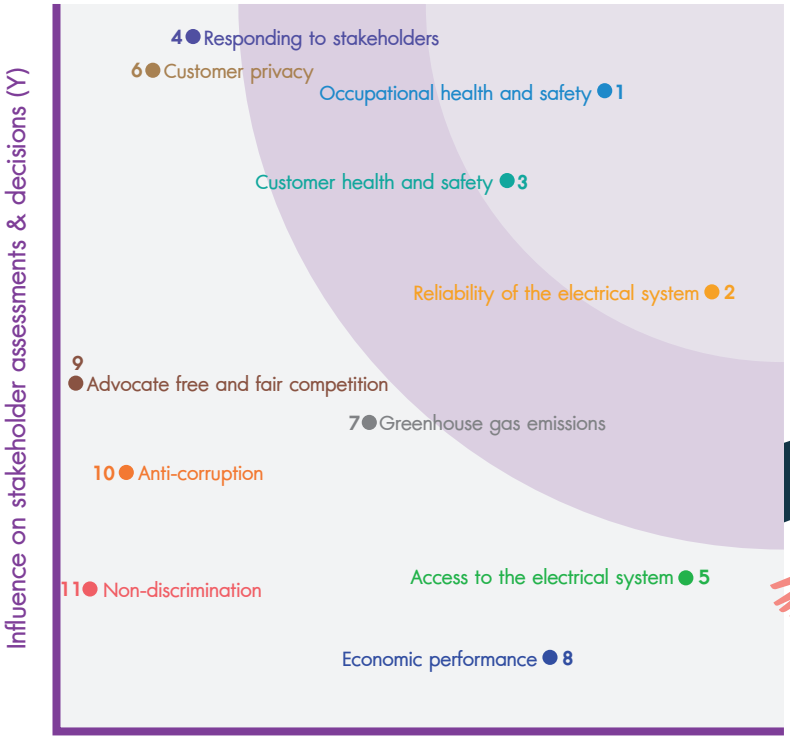
3. Verification of the accuracy and completeness of sustainability topics

As a result of prioritizing sustainability topics, PEA has taken all 11 sustainability topics to be considered, reviewed and approved by the corporate governance and social responsibility committee. This is to ensure that PEA's sustainability topics are accurate, complete and able to respond effectively to the needs and expectations of the stakeholders.

Materiality topics with significance for the sustainability of the PEA [3-2]

	Materiality Topics	Boundary of Sustainable Topics	SDGs
1	Occupational health and safety	PEA/Partners	3, 8, 16
2	Reliability of the electrical system	PEA/Partners	1, 7
3	Customer health and safety	PEA	16
4	Responding to stakeholders	PEA	-
5	Access to the electrical system	PEA/Community and Society	1, 7
6	Customer privacy	PEA	16
7	Greenhouse gas emissions	PEA	3, 7, 8, 12, 13, 15
8	Economic performance	PEA	8, 9
9	Advocate free and fair competition	PEA / Regulators / Governments	16
10	Anti-corruption	PEA/ Partners	16
11	Non-discrimination	PEA	5, 8

Assessment results of significant topics in sustainability



SUSTAINABLE BUSINESS

PERFORMANCE

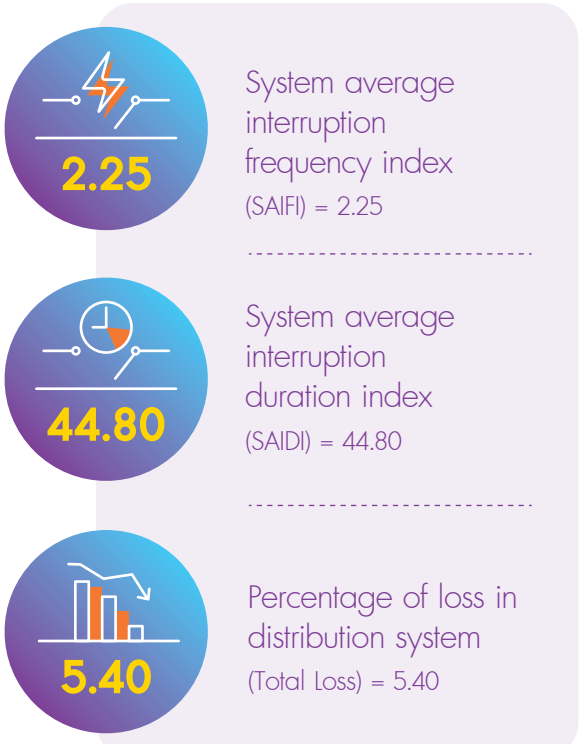
Reliability management of electrical systems (3-3)

Electric power is a basic utility and the main factor driving the economy and society. The PEA, which acts as the main electric power supplier and service provider, is imperative to supply enough electricity to meet the demand as well as to create stability and reliability in the power system. If PEA can't provide and create the reliability of electrical systems, will affect the broader business sector causing the ability to run business to a halt, and affect the quality of general public's life.

PEA aims to develop a smart grid system with digital technology, which can support the use of electricity fully, can connect all electrical industry activities together, and supports the changing structure of utilities and industries in the future. The purpose of this development is to provide stable, safe, reliable, and sufficient electricity to present users and potential users in the future. The development of PEA's distribution system in 2021 was conducted according to the electric power system development plan under the 12th National Economic and Social Development Plan (2017 - 2021).

Target (3-3)

- Stable, safe, and reliable electric power system and continuous distribution. Meet the target of SAIFI and SAIDI index (equal to BSC level 5).
- Acquire the standard and construct related equipment to support "Smart Grid" system as well as pilot areas or "Smart cities" that can operate following the plan, including Chiang Mai, Phuket, Samui Island, and an EEC area.
- Sufficient electric power system for the demand of present/ future users and worth to invest.



Operational strategies (3-3)

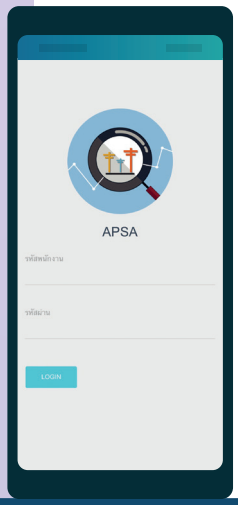
- Review the related risk and provide the code of practice of risk management to improve the efficiency and reliability of electric power systems, such as annual maintenance and preventive maintenance.
- Construct electric power stations and monitor performances according to the plan to distribute enough electricity and build reliability.
- Improve and connect distribution system in business areas, industrial areas, industrial estates, and other important areas to cope with the expansion of economic area and the strategic area of the country.

Management approach (3-3, EU6)

Strong Grid Development Plan: operating in each region as follows

PEA Region 1

- Control, monitor, prevent, and correct SAIFI index, SAIDI index in accordance with the criteria set by PEA. In addition, the maintenance schedule is planned by tracking operations from the "APSA" application.
- Preventive maintenance is planned on a quarterly basis based on the life cycle and has used other devices such as thermal cameras to check for malfunctions or malfunctions of the system, etc.
- Install additional protective devices such as snake guard/ bird guard, and insulating covers (i.e., transformer bushings, drop surge traps) in municipal areas or risk areas.
- Detect non-technical violations such as illegal use of electricity without passing the meter or the meter is broken/ damaged.



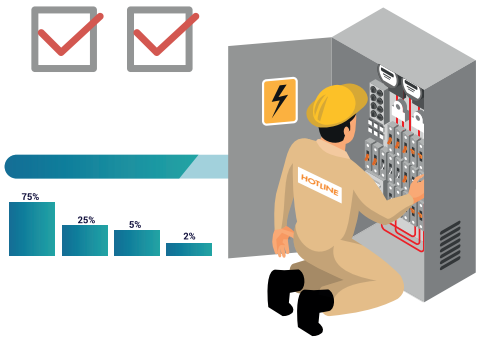
PEA Region 2

- Provide activities to increase the quality of the power distribution system, such as preventing power outages from animals, preventing power outages from natural disasters, and preventing power outages from trees.
- There is a Smart Patrol Plan to survey and improve the broken circuits and maintain all electrical circuits (Only the circuit with power supply).

- Develop Smart Grid infrastructure to support renewable energy and energy management technology that will happen in the future.
- Support the efficient use of electricity.
- Determine policies/measures to mitigate stability impact and loss in the distribution system by covering from transmission line measures to low voltage transmission lines.

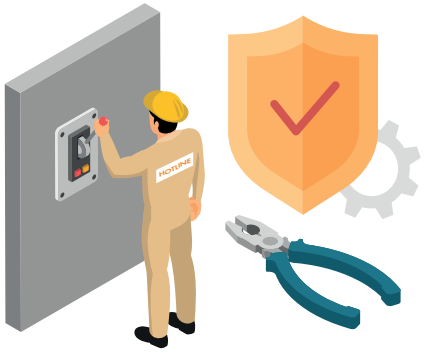
PEA Region 3

- Improve the electrical distribution control system in all parts to support the changing technology using GIS2 to access the OMS system.
- Improve the electrical system to support the special economic development zone according to the specified operation plan.
- Improve the power distribution center to be up-to-date and efficient in diagnosing and fixing power failures quickly.
- Prepare a plan to upgrade the power quality of industrial estates in the Eastern Economic Corridor (EEC) Development Project.



PEA Region 4

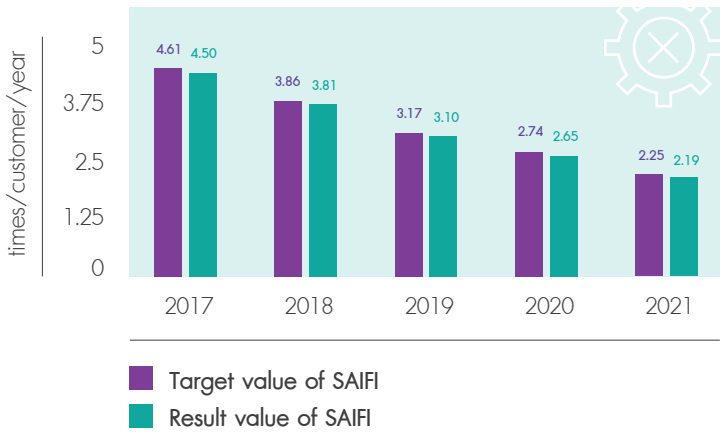
- Provide a plan and follow-up to solve the problem of electric availability in nearby areas in case of a power failure in the whole station.
- Inspect the distribution system and prevent power failure in the Inside Zero Outage Zone (IZOZ).
- Additional idle power supply project to increase stability and reduce the number of unpowered circuits.
- There is a remote-control project of an RCS switch.
- Allocate additional FRTU to make SF6 as an RCS at least on planning criteria (2.5 units per circuit).

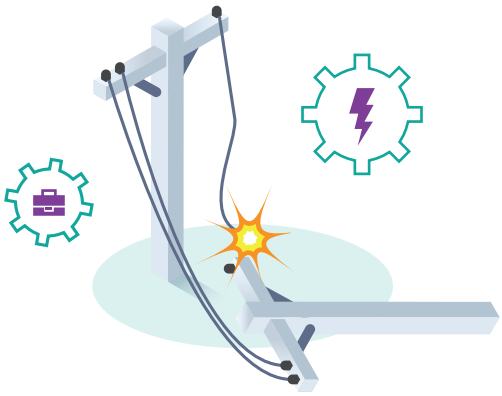


- **Develop technology and communication to support the smart grid development project** by developing a plan to expand the fiber-optic network, which the contractor is in the process of surveying the fiber optic cable installation path, preparing the installation drawing, and preparing to install equipment. In addition, there is the IP Access Network Development Plan, which has already begun to operate in all regions of the country.
- **Develop Third Party Access (TPA) services** by establishing a working group to test innovations for supporting energy services (Energy Regulatory Commission Sandbox: ERC Sandbox) and inspecting the conditions of the pilot area (Northern Biogas Co., Ltd., Nakhon Ratchasima Province) as well as procurement and testing of equipment such as meters, communication systems, and equipment installed to connect to Digital Platform.
- **Forecast of electricity demand per a power station in the future** by using a forecast model statistical method and various assumptions that are the factors affecting the use of electricity in the future, then use the obtained data to forecast and plan the operation of the power station and transmission lines in the future. In addition, these are analyzed to find ways to strengthen the stability of the power system in the short term (2022 - 2023) and long term (2021 - 2027) by using the program "DIgSILENT Power Factory". It was found that the electricity demand in the service area will increase by an average of 2.36% per year. Therefore, PEA has prepared plans/ measures to support the demand, such as Transmission and Distribution System Development Project (phase 2), Power System Development Project in major cities (phase 2), long-term plans for underground cable construction, improving the electrical system to be the underground cable "1 province 1 Chaloem Phrakiat Road Project", Expand the electric area for new residents project (phase 2), expand electrical installation on islands project, install an intelligent meter system (AMI) project for large power users, etc. (EU10)

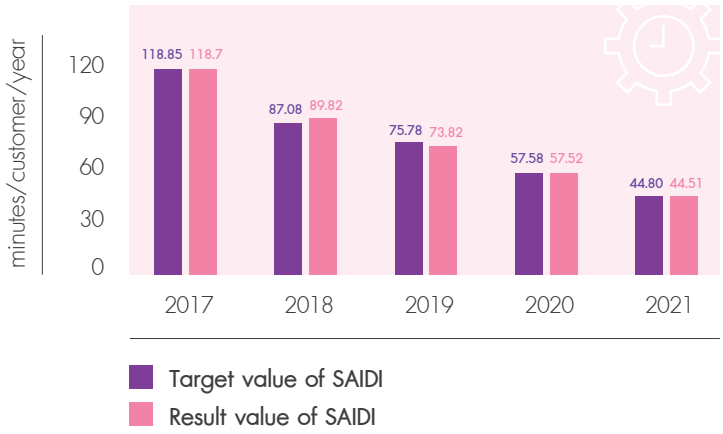
2021 Outstanding performance (EU28, EU29)

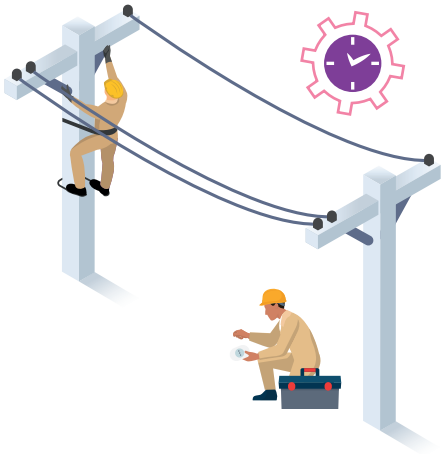
SAIFI



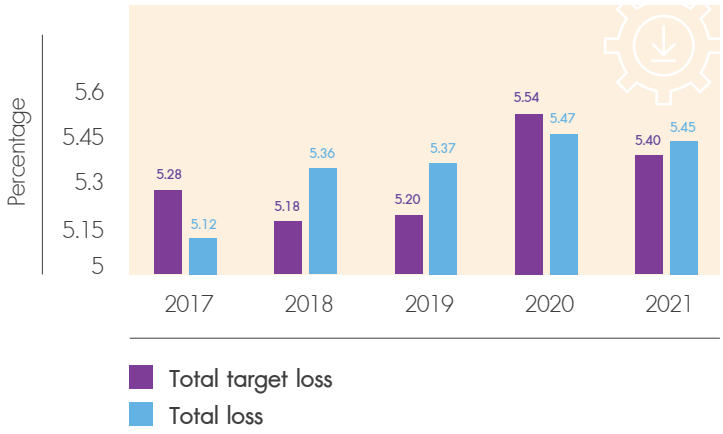


SAIDI





Total loss



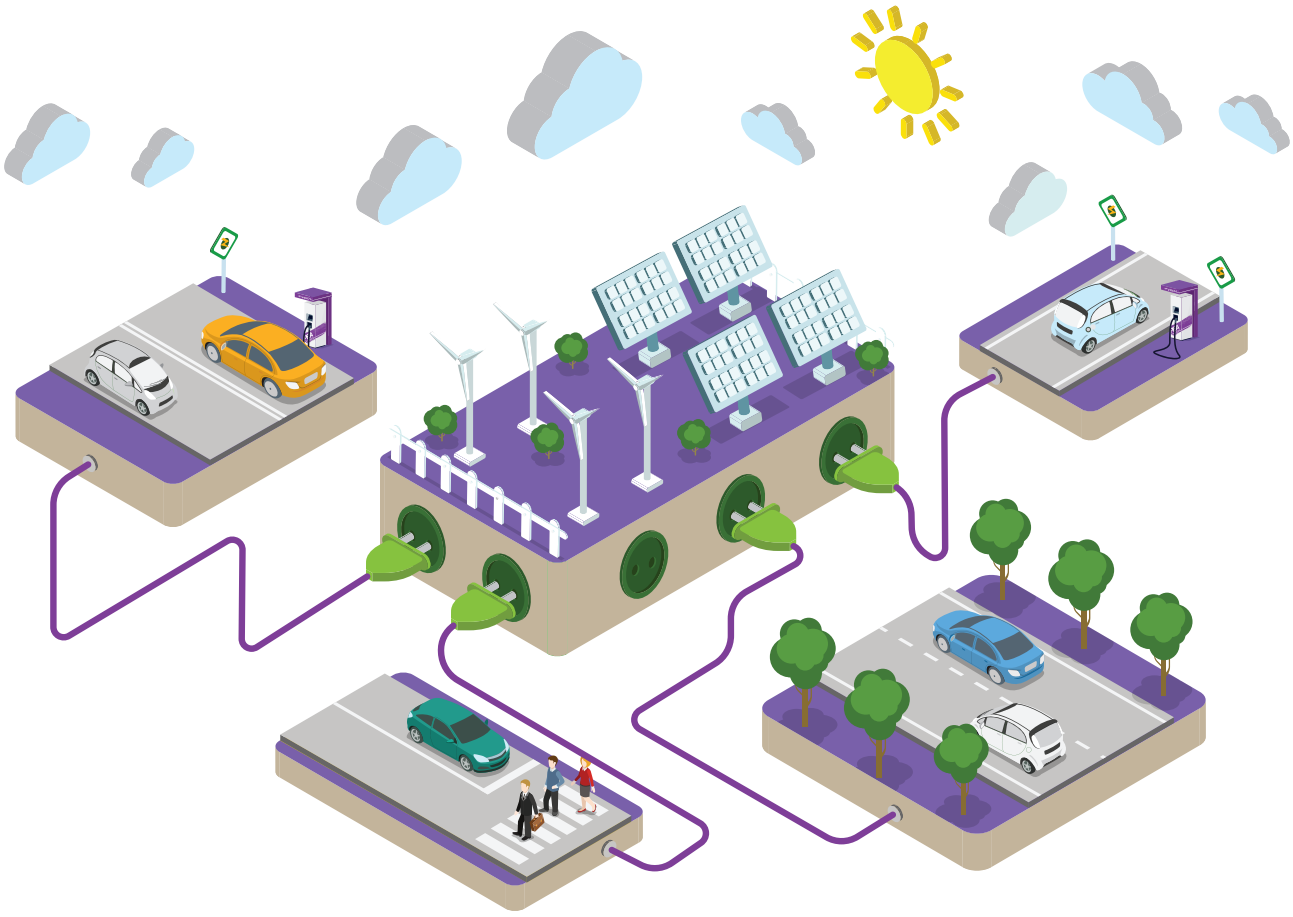
SAIFI and SAIDI index were on target and **decreasing year by year**

Remark: the SAIFI and SAIDI indices exclude the three southern border provinces.

Operational process	Result
 **Smart Grid Project** in Pattaya, Chonburi province	The success plan was completed (100%) and in the process of electric meter installation and approximately 100,000 units have been used (about 2/3 of the project).
Type of resident users used higher than expected electricity, there is a 1.63% of discrepancy due to the impact of the COVID-19 epidemic, including the issuance of various government measures to mitigate the impact of COVID-19, such as the work from home, lockdown, and measures to help electricity bills. As a result, the use of residential electricity is increased.	The results in 2021 found that the annual growth of distribution unit was 3.57%, which was higher than expected electricity. There was a 0.76% of discrepancy according to the type of power consumer (EU 10). • Electricity demand was 136,396 GWH. • Number of electricity users was 20,985,283 people.
Type of large business users used higher than expected electricity. There is a 1.20% of discrepancy due to the steel and automobile industries using more electricity as the result of the entry of electric vehicle technology as well as the government's export stimulus policy.	
Type of medium business users used less than expected electricity. There is a 1.06% of discrepancy due to the impact of the COVID-19 epidemic causing most medium businesses, commercial buildings and various educational institutions, must use the work from home measure and provide online teaching. As a result, the unit of electricity consumption is reduced.	

Improvement plan for future operation (3-3)

- Improve the operation of the inspection and maintenance of the electrical system to reduce power outages. Increase the reliability of the electrical system by improving the application as a tool to the relevant employees, such as changing the APSA applications to MJM and MFO applications that operational data can be analyzed more accurately and more reliability due to the program can be interfaced with GIS technology and can check the completeness of the electrical system inspection. It will be available from Q3 2022 and will assess the operational result quarterly to improve the further system.
- Investment to reduce SAIFI/SAIDI costs with an expected budget of 77 billion baht, such as power station projects, transmission lines, high and low voltage distribution systems, etc.
- Acquire Asset Management Standard (ISO55000) in 2022.



Cyber Security

Nowadays, digital technology plays a vital part in daily life and corporate operations, which may have both beneficial and negative consequences, such as facilitating commercial operations and providing a cyber threat to all sectors, including the economy and national security. Importantly, “attempts to obtain unauthorized access to a system or external attack” or “intrusion attempts” are the highest cyber threat. The PEA has consistently prioritized the digital technology security maintenance since information utilization systems in data management are a critical part of PEA’s business operations. As a result, PEA is aware of the risks that the organization may face from malicious cyber threats to its infrastructure systems or various databases, which could result in damage to both the organization and the national economy, as well as a minimization in the image and credibility of PEA’s stakeholders.

The PEA restructured its institute in 2021 to support immediate cyber security operations by modifying the Department of Standards and Information Security to the Department of Cyber Security Standards and Maintenance, which is primarily responsible for maintaining and monitoring the organization’s cyber security in terms of personnel, processes, and technology. PEA’s Computer System Security Coordination Committee and the Information Technology and Operation Technology section have also been responsible for managing and coordinating internal and external institutes as well as monitoring and dealing with potential cyber threats through the Security Operation Center (SOC). In addition, PEA established information and procedures for dealing with cyber threats and defined an annual review and assessment of cyber security-related risks. PEA’s operations focus on compliance with legal requirements and the essential standard in the category of information security standards (ISO/IEC 27001) as the basis that PEA is using in the analysis and planning of risk control that may exist further.

Target

Strengthening the Security and Stability of Digital Technology.

Development of cyber security capabilities and digital technology management toward international standards for supporting the continuous growth of PEA’s business.

Building trust among stakeholders and related parties in both the public and private sectors, PEA has standardized management of cyber security and information systems.

Strategy

• The focus is on building security and confidence in digital technology operating for all stakeholders, which is the fundamental factor that drives organizations towards Digital Utility.

• Building the security of information and communication systems to enhance confidence in communication and various transactions through online systems, such as providing an effective and secure payment system that meets the stakeholders' demands.

• Guidelines and standards determinations for service employees across the country to protect personal rights and personal information of service applicants to support the future growth of digital technology use, such as guidelines for using mobile commerce or smartphones, guidelines for using social media, etc.

• Determining an appropriate cyber threat, surveillance, and countermeasures in accordance with international standards, particularly the protection of critical infrastructure such as SCADA systems to ensure operational security and the promotion of cyber threat information exchange networks.

• Increasing awareness and consciousness of cyber threats to all levels of employees are crucial to continuing working in the organization and developing digital technology management to international standards in operations, management, and services, by focusing on the improvement and application of information technology (IT Governance) into practical governance for enhancing the decision-making processes and digital technology management to be effective and align with the international standards as well as the true strategy of the organization with various tools and standards using appropriately.

Cyber Security's Management Approach

The PEA is regarded as an organization that is the country's key infrastructure according to the Electronic Transactions Commission Notification in the list of agencies or organizations, or the work of an agency or organization topic, considered as an important infrastructure of the country and must be done by the method of safety at the strict level, 2016 which related to the laws covering confidentiality, integrity, and availability of information systems according to the Electronic Transactions Commission Notification in Standards for Security of Information Systems under Secure Methods topic, 2012. Additionally, the PEA management aligns with the Cyber security Act B.E. 2562 (2019), the announcement of the Cyber Security Oversight Committee on Code of Practice and Standard Framework on Cybersecurity for Government Agencies and Important Infrastructure Agencies topic, B.E. 2564 (2021). However, to ensure the security of PEA can be carried out effectively and consistently with laws, and international standards, so the rules, policies, practices and measures have been set for the management and security of information and cybersecurity as follows:

- PEA regulations on Management and Information Security 2017
- Information Security Policy 2018 and Information Security Policy No. 2 (2019)
- Information Security Practice Guidelines accompany the Information Security Policy
- PEA measures for the use of information assets, 2020

In 2021, the PEA had management in accordance with the important requirements as follows:

1. The PEA provided a process for information technology management of security systems according to ISO/IEC 27001 standards, which has a scope of work covering critical organizational infrastructure, especially

the information technology of PEA's computer centers. Therefore, PEA continuously manages information security risks following ISO/ IEC27001 by referring to the procedures of information security risk assessment methods, the structural scope of the information security system, roles and duties of stakeholders, and internal and external factors that are consistent with the organization's objectives and context. PEA has established procedures and methods for assessing information security risks that have been effective since 2017 and are reviewed annually by considering the inputs of stakeholders both inside and outside the organization that has changed according to the laws.

The action plan for 2021 stipulated that the scope of cyber security development and digital technology management needed to be expanded to international standards. There was an indicator of the success of the plan to build security standards (ISO 27001) at 100

percent by 2021, which PEA would expand the request for certification according to ISO/IEC 27001: 2013 to PEA Area 1 (South), Phetchaburi province; PEA Area 2 (South), Nakhon Si Thammarat province; PEA Area 3 (South), Yala province, and can maintain the 1st certificate of the PEA headquarter, as well as PEA Area 1 (North), Chiang Mai province; PEA Area 2 (North), Phitsanulok province; PEA Area 3 (North), Lopburi province; PEA Area 1 (Northeast), Udon Thani province; PEA Area 2 (Northeast), Ubon Ratchathani province; PEA Area 3 (Northeast), Nakhorn Ratchasima province; PEA Area 1 (Central), Ayutthaya province; PEA Area 2 (Central), Chonburi province; PEA Area 3 (Central), Nakhorn Pathom province to cover all of the necessary structural properties in 12 regional areas across the country.

2. Implemented different tools and technologies, such as a Log Collection System, Security Information and Event Management (SIEM), and setting a regulating policy of the devices through the ITSM system, to perform monitoring audit results, risk management, and surveillance for dealing with initial or possible threats and building a quicker response time for customer complaints.

3. The PEA organized relevant personnel development training courses following PEA policy and international standards by managing training for employees in specific departments and general employees in the management department, as well as communicating to create awareness of information security for all employees through video in 2D animation format and Infographic media. For example, password policy, dangers of using pirated programs, phishing emails, distributing knowledge, and providing warnings through various channels, such as Lock Screen before Login PC, @PEAFriends, PEA publications, etc. The following training courses were important for executives and employee in 2021:

- Using the Learning Management System, provide training to raise cybersecurity awareness of employees (all functions and the PEA in each of the country's 12 districts)
- For the year 2022, new employees will be enrolled in an "Onboarding Program" on "Security in Information Systems" via an e-learning system.
- A training program and a Secure Software Development Life Cycle for information system developers to increase their knowledge of information security.
- Information Security Management System Course for the Information Security Management System working group.
- Information Security Awareness Program 2021 for central and provincial government working groups and sub-working groups comprised of 12 districts and outsourced companies, engaged in PEA's business operations.
- Working groups and sub-working groups from central and provincial locations completed cyber security training or NIST courses, comprising 12 districts and OT departments (Scada AMR GIS).
- Emergency Response Plan (ERP) and Business Continuity Plan (BCP) training courses for supporting the incidence of cyberattacks for the year 2021 through a Tabletop Exercise, in collaboration with the PEA CST and SCADA.

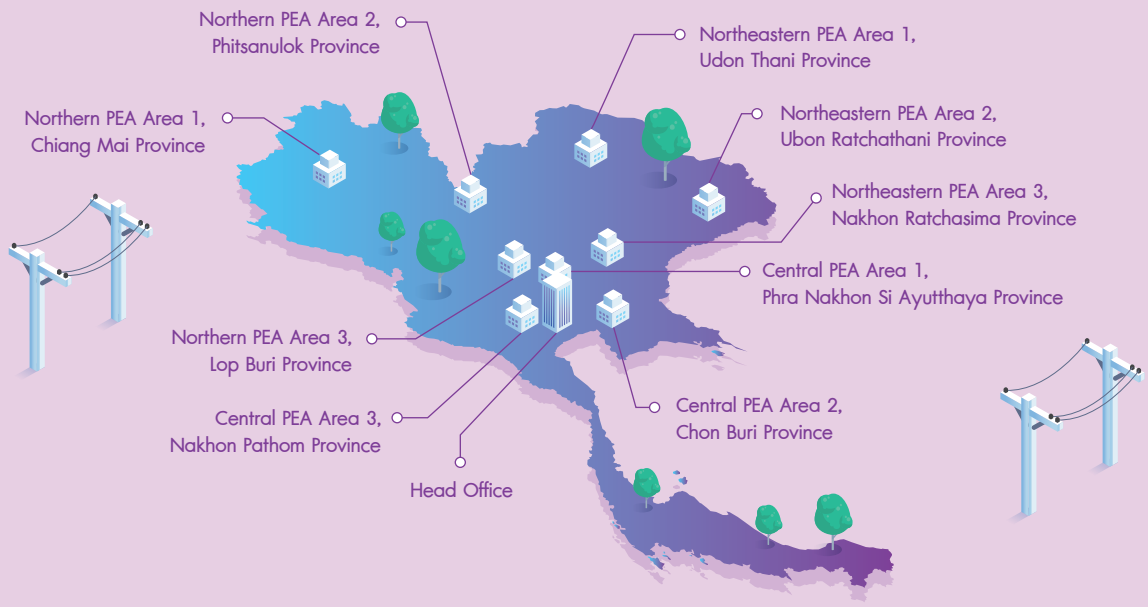
4. The PEA established a Security Operation Center (SOC) with surveillance personnel for cyber-attacks 24 hours a day, 7 days a week, covering both information technology and operating technology with a prompt notification system for those involved.

Cyber Security Performance

• The PEA developed an Information Security Management System and certified following international standards ISO/ IEC 27001, covering all infrastructure in 12 regions. Additionally, within the year 2021-2022, PEA also planned to expand the scope of certification to the Critical Infrastructure of Computer Software Systems for PEA's primary business projects (Phase 2), and complete the Bill Printing and Payment Management project (BPM).

2020 Outstanding Performance [103-3]

There were 10 PEA offices certified with ISO/IEC 27001.



There was no complaint
of customer privacy violation and loss of customer data.

Surveillance officers were on duty to monitor for cyber attacks
for 24 hours and 7 days a week (24/7) and to alert parties involved.

• The PEA measured the information security management effectiveness by specifying the criteria to measure the information security effectiveness in the operational steps of the effective measurement, continuously monitored, and reported the status of the risk management plan of information security.

• Internal operations of the information security management system were audited by the Internal Audit and certified body on a yearly basis, the results were used to improve the operating process efficiency.

• The PEA participated in the Intensive Cybersecurity Capacity Building Program, Phase 1, to enhance the country's cybersecurity personnel development. The target group was the Critical Information Infrastructure (CII), both the public and private sectors and agencies involved in the implementation of the Cyber Security Act B.E. 2562 (2019), consisting of basic courses, expert courses, and executive courses.

• Developed a National Incident Response Plan and Incident Response Fundamentals with the Critical Information Infrastructure (CII).

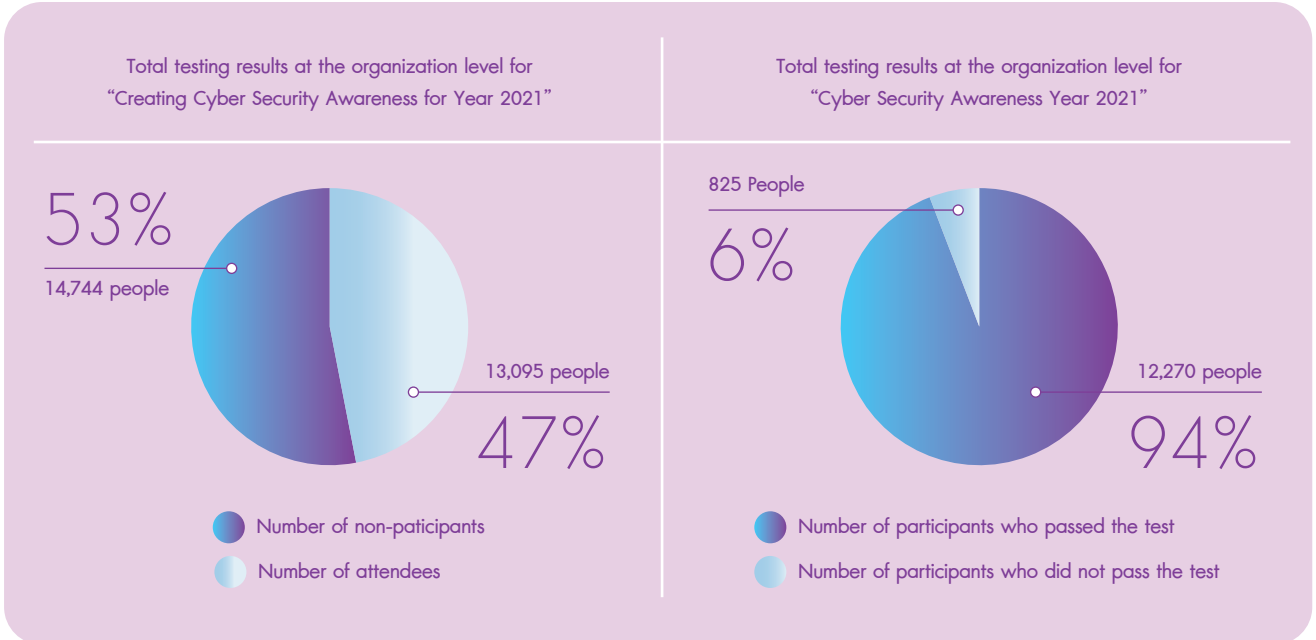
• The PEA had no cyber threat occurrences in 2021, according to the results of operations. However, the findings of the PEA's Cyber Security Operations Center's evaluation of cyber threat monitoring revealed that:

- 51% of the threats occurring in PEA came from malware.
- 22% was a threat that malicious people used PEA's information gathering search.
- 18% came from unauthorized access.
- 9% were other causes.

Therefore, PEA has established the following approach to avoid attacks based on these findings:

- Install protective detection equipment or software on the information system to prevent and detect malicious files, as well as to update the operating system and various software to the most recent version.
- Improve the cyberthreat response and response procedures
- Enhance the proactive operations of the cybersecurity operations center to protect against a threat event before it occurs.
- Reiterate the PEA's information security policy and security awareness training for employees.

• The result of promoting employees' knowledge to keep up with cyber threats from the training in the information security awareness course in 2021 found that a total of 13,095 employees attended the training, out of the target of 8,634 people, representing 47% of the total employees; 12,270 people passed the test, or 94 percent of all those who attended the training, out of a target of 6,704 people.

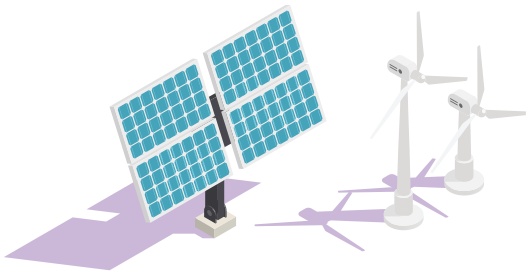


- From a simulation of a cyber threat attack (Cyber Drill) in the form of phishing emails that notify users to confirm their identification and the necessity to access the information system to update the database.

According to the diagram, The results were summarized by sending phishing emails to 500 employees, as a consequence of the following table:

Indicator	Sending a Phishing Mail	Opening a Phishing Mail	Opening and Click a Link within an E-mail	Opening Click a Link, and Sending information
Number of people	500	41	36	33
Percentage	-	8.20%	87.80% of total employees, who opened a phishing mail	91.67% of total employees, who clicked a link

In conclusion, the PEA found that the organization was at high risk of phishing mail, so PEA has set up activities to create greater awareness among employees by organizing training courses and communicating for identifying potential threats, observation, countermeasures, prevention, and an action plan to test phishing mail attacks through PEA employees.



Improvement Plan for Future Operation

- The PEA intends to proactively monitor potential cyber threats to prevent future risks by utilizing the technology to help find and collect threat Intelligence, threat analytics tools, and automation tools to deal with the threat (Incident Response), which is expected to be completed within the year 2022.
- Improving cyberthreat rehearsals by cooperating with the country's main regulator to cover all 12 districts.
- Establish a structure and operational guidelines ready to support surveillance operations in 2022 through the development of a Security Operation Center (SOC).

Customer Privacy (3-3)

In accordance with The PEA's services planning with the goal of becoming a "Digital Utility" entails challenges via data driven within the year 2022, PEA is a large organization that holds data in responsibilities involving procedures and contractors processing large amounts of personal data. Therefore, PEA consider customers' personal data issue to be critical in our business and has emphasized the importance of personal data protection and privacy violations in building trust for stakeholders. Focus on utilizing customer data based on the objective associated with customers has consented for and not processed over the operated task. PEA has committed to executing the data protection guideline and provided policies in accordance with the Personal Data Protection Act B.E. 2562 (2019) or abbreviated as PDPA for customer data processing, data storage, and data leakage prevention. Nonetheless, if there is a customer privacy violation, PEA will ensure the investigation process to find the cause and be responsible according to the relevant law. In addition, PEA will continuously improve policies and guidance manuals to prevent the impact on customer privacy and enhance the organization's management of customer personal data.

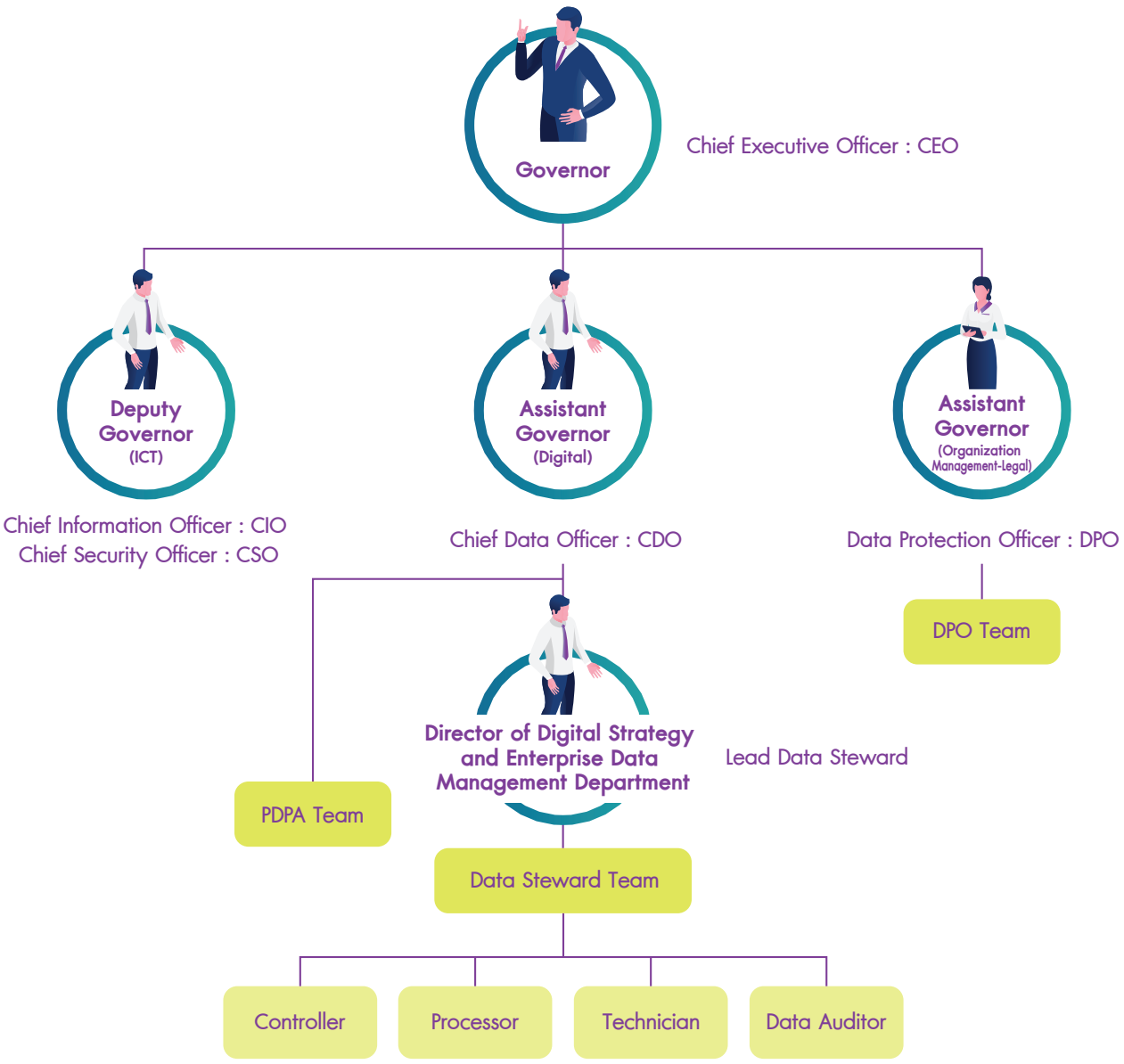
Target (3-3)

- Being certified with ISO/ IEC 27001 for Information security management to cover the head office and 12 areas.
- Raising employees' awareness of data usage and customer privacy by providing guidelines, organized meetings, and training through online courses. The number of participating in training courses on data governance and personal data protection must be at least 90% of employees.
- At least 90% of employees have passed the Data Governance and Personal Data Protection training courses. (Passing score of 80%)

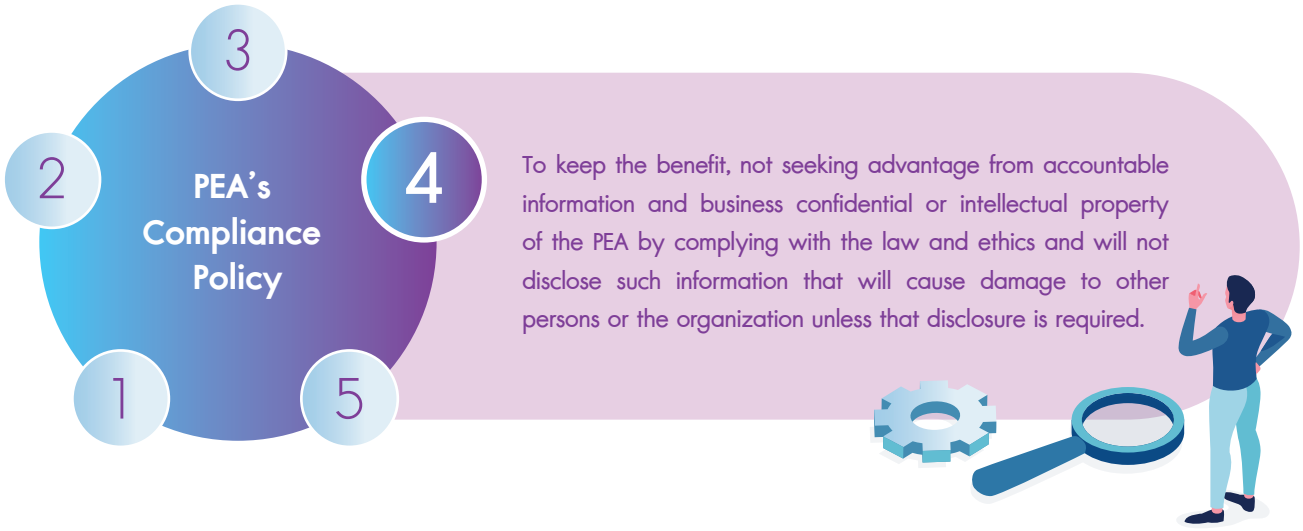
Strategy (3-3)

According to the focus on customer privacy, The PEA has started performing on the protection of personal data within the organization since the Personal Data Protection Act B.E. 2562 (2019) has published in the Government Gazette (27 May 2019). PEA has established policies, regulations, and related practices to control the PEA's customer privacy operation following PDPA laws and relevant standards. Also, always equip our employees and workers with knowledge and understanding of personal data protection policies and practices. PEA has assigned individuals, agencies and working groups that are directly responsible for personal data protection.

PEA Privacy Policy, 2021



- **Determine PEA's compliance policy** for executives and employees to adhere to the principle of achieving their duties and ensure that PEA strictly operates business comply with the laws, regulations, orders, and announcements both from inside and outside the organization.



- **Provide an announcement on governance policy for data and guidelines of the PEA 2019** to be adhering to Digitalization of Public Administration and Services Delivery Act, B.E. 2562 (2019) covering management and integration of data. Therefore, the policy detail has comprised as follows:
  - General Domain
  - Data Creating Storage and Quality Control
  - Data Processing and Use Domain
  - Data Request Exchange and Integration Domain
  - Data Disclosure and Confidentiality Domain
  - Data Archive and Destruction Domain
- **Provide an announcement on policies and practices on personal data protection of the PEA 2020** for data owners such as employees, workers, customers, and business partners of PEA has acknowledged and understand PEA's personal data protection policy and practice. The policy has been composed of details covering the following content:
  - Personal Data Collection, use or disclosure
  - Personal Data Security
  - Personal Data Ownership
  - Data Limitation
  - Personal Data Protection Policy Review

Customer Privacy's Management Approach (3-3)

PEA has gathered personal data processes within the organization to control the operation in line with the PDPA law and for agencies or sectors to assess the privacy impact of their various activities or responsibilities for handling the potential negative impact on customers. PEA equips guidelines for data privacy management for employees to operate as follows:

1. Work Manual on Personal Data

- Procedures and workflow in case of general personal data complaints, personal data leakage complaints or data violation reports.
- Data Subject Access Request (DSAR).
- Determination of any operation or activity where personal data is processed must be required to sign Data Processing Agreement (DPA).

2. Public relations, clarification meetings and training on the processing of personal data

- Create a personal information webpage that contains relevant policies, regulations, and guidelines for employees to learn, conscious and understand. Broadcasting personal data awareness through media or communication channels within the organization such as screen savers, posters, and e-posters.
- Organize clarification meetings such as a meeting on personal information protection via online channels or onsite for employees.
- Provide training and define a criterion of the level of awareness for data governance and personal data protection.

3. The Privacy Policy is reviewed annually by reporting the results of the organization's performance appraisal to the executive or governor of PEA to be operated and improved the policy, then enforced within all responsibilities areas.

4. Compliance with the international standard for Information Security Management Systems (ISO/ IEC 27001) which covers risk assessment, data security and management design. It has been recognized as a management approach to support the secure storage of both digital and documented data.

5. Procedures or details of management when receiving complaints of violation of personal data or customer data leakage.

Customer Privacy's Outstanding Performance

PEA has set the criteria for creating knowledge and understanding of personal data protection for employees. In 2021, all employees were required to attend training on data governance and personal data protection and provide plans to assemble additional courses including setting a criterion in 2022 as well. For assembling records of personal data processing activities within the organization, PEA will specify indicators that all areas must have analyzed and record the details of personal data processing in their responsible assignment. The significance of customer privacy performances is as follows:

- Employees attending and passing the training course on data governance and personal data protection (Personal Data Protection) at least 90%.

Data Governance Course

Participants
97.23%

Passed the test
97.00%

Personal Data Protection Course

Participants
96.70%

Passed the test
96.31%

- There was no complaint of customer privacy violation. (418-1)
- There was no customer personal information has been leaked or the number of breaches of the customer's personal data. (418-1)

Improvement Plan for Future Operation (3-3)

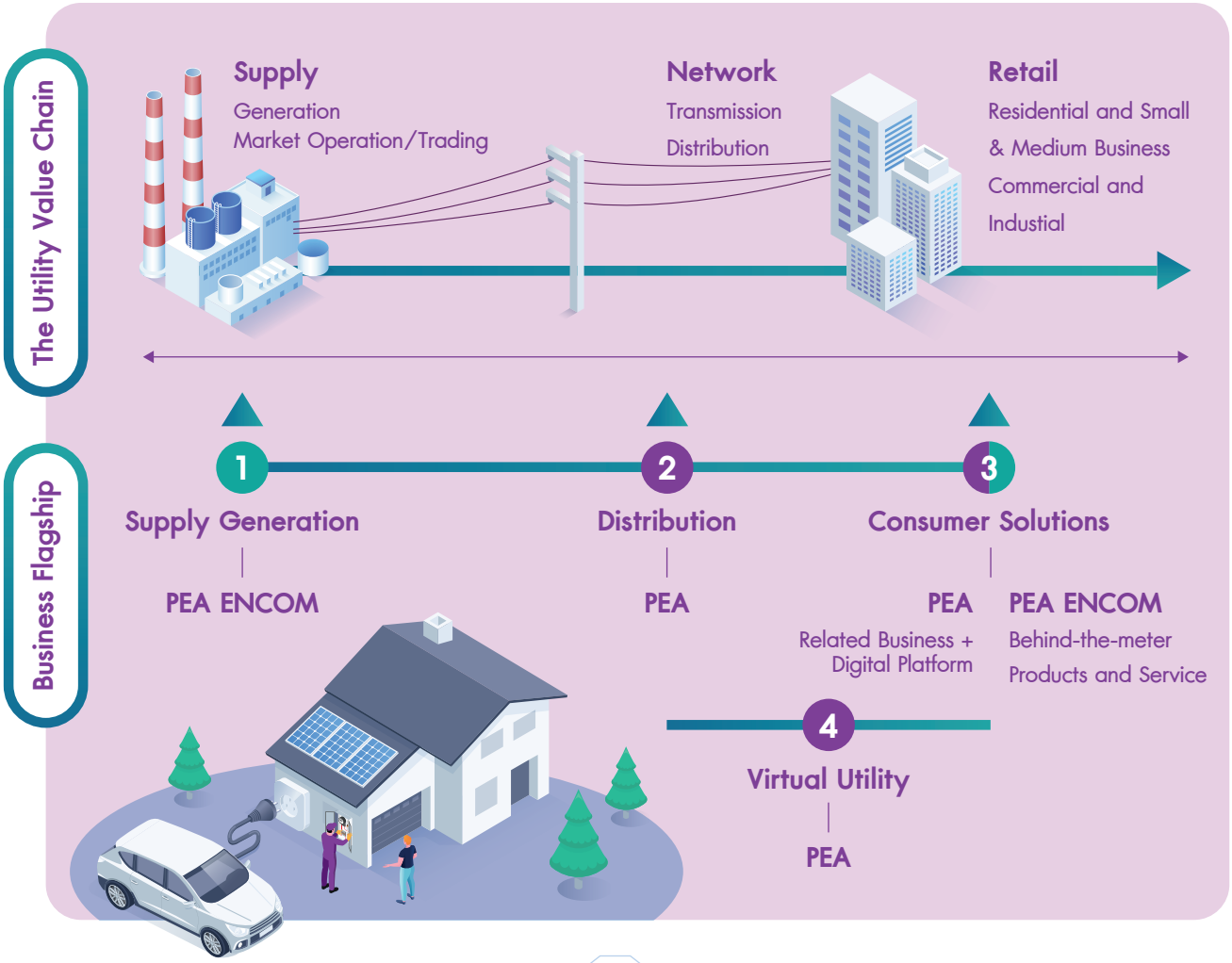
- PEA's data protection committee to manage the utilization of data within the organization.
- Provide detail of the Record of Processing Activity (ROPA).
- Raise awareness of PEA's personal data protection continuously through public relations media such as screen saver, poster, and intranet.
- Arrange to conduct training on the implementation follow a plan when a leak or breach of customer information occurs.

Economic Performance (3-3)

The current energy industry situation has been driven by Digital Technology including developing the Energy Trading Platform Project in various experimental areas, which can reduce the role of energy suppliers/ traders and create more choices for electricity users in the future. Moreover, promoting competition in price and service and the change in the role of electricity business operators can affect the structure of energy industry sector, rules, electricity tariff structure, and electricity distribution. This is considered the main income of PEA. To adapt, mitigate changes and maintain the condition of the business to operate continuously, PEA has implemented the strategic plan by managing with a prudent monetary and looking for opportunities to expand new business including preparation for the upcoming liberalization of the electricity business. In addition, in 2021, PEA has increased awareness of greenhouse gas emissions in businesses to build carbon credit and further create sustainable value for the community and society.

PEA's revenue comes from 4 operations as follows:

1. Income from the acquisition of shares in the energy business (Supply generation).
2. Income from electricity distribution services in 74 provinces of Thailand.
3. Income from consumer solution services and related business such as supplementary business, digital platform & solutions business, and behind meter products/ services business.
4. Income from the management of energy trading/ exchange (virtual utility) such as energy trading etc.



Target (3-3)

- Affiliates have a business model, governance structure, and earnings recognition in a portfolio manner.
- Develop the National Energy Trading Platform (NETP) and extend to other digital platforms for commercialization and market leadership.
- Achieve both targets of output and outcome of organization transformation into a Digital Utility.
- Supply and install 190 charging stations for electric vehicles (2nd phase) in 2022-2023.
- Revenue from related businesses 6,720 million baht within 2025.
- Productivity Ratio is level 1 in 5 state enterprises.

Operational strategies (3-3)

- Determine the policy and direction of the operations of the affiliates clearly.
- Implement the PEA Portfolio Management plan.
- Enhance organizational performance and provide cost accounting between regulated business and non-regulated business, including activities cost accounting (ABC Costing).
- Supervise and monitor operations effectively.
- Ensure all units understand the overall role and relationship of the Energy Trading Platform and are appropriate for their duties.
- Review the laws, rules, and regulations to support the operations in related businesses, including directing the operations of affiliated companies to create synergies.

Management Approach (3-3)

- **Prepare and operate according to the Asset Management Roadmap,** which defined the policy framework, objectives, strategy, and operational guidelines in asset management of the organization throughout the process of acquisition, utilization, maintenance, and distribution. Thus, the lifetime costs are at an optimized point.
- **Determine the policy and business model between the PEA and affiliates.** There is a meeting to discuss with related parties and a workshop of the PEA Board of Directors and high-level executives to determine the policy, business model, business portfolio design, and business flowchart of PEA and its affiliates. Each year, target plans, business performance, and the timeline for delivering the business are identified. Once completed, it will be communicated to relevant departments and then use as a framework for the affiliated companies' plans.
- **Improve the organizational structure and develop a Service Level Agreement (SLA)** by allowing all units/ departments to consider the work system and work processes to analyze sub-processes that may need improvement as well as bringing digital technology to solve problems, such as real-time operating system, providing customers service through Digital Service, etc. Thus, structure improvement and SLA development can increase operational efficiency and reduce unnecessary costs caused by rework or sub-process and make the organization's operations more efficient and faster. In addition, the organization's operational manuals are reviewed, and the appropriate delivery time is set for each process.

• **Provide cost accounting clearly** according to the changing structure of the electrical industry by providing Regulated Business cost accounts. It will consider the cost-effectiveness, economic benefits, and reasonable costs according to the electricity tariff structure set by the Energy Regulatory Commission (ERC). For the non-regulated business will consider the opportunities of related business that can be value-added and enhance the business performance of PEA for sustainable growth.

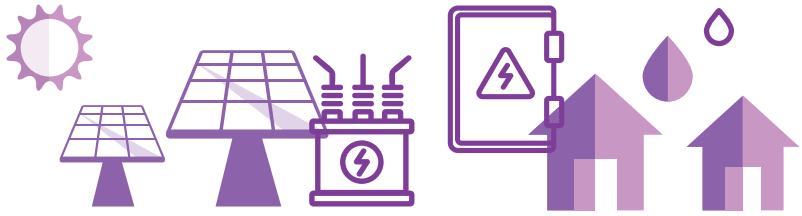
- Regulated Business is an investment in a project according to government policy and electrical system development plan during the 10-12 plan, including urgent and necessary policy projects, such as the project to expedite the expansion of the electrical system for households without electricity, projects for the development of electrical systems covering remote areas and island areas, etc.

- Non-Regulated Business is an investment project to reduce the burden of government investment and accommodate changes in the electricity industry structure, such as electricity trading among the people, alternative energy with the surrounding communities, using blockchain technology in "peer-to-peer" energy trading, and creating a new business model in the energy business, such as purchasing electricity through an intermediary (Supply and Load Aggregator) and electricity users business (Behind the Meter), etc.

• **Examine laws, ministerial regulations, cabinet resolutions, and new laws, prepare or improve/ contribute to improvements in regulations, rules, regulations, rules, and guidelines for operations** to support the PEA operations and related businesses, such as compensation or humanitarian assistance to third parties. In addition, there is providing the prevention of conflict regulation between personal and public interests includes appointing relevant working groups.

• **Design the Energy Trading Platform system to suit the role of the PEA.** The study and design of the Energy Trading Platform system for the opening of free electricity business are set by a working group, including hiring a consultant to study the relationship between the platform and the relevant parts, mechanisms design, systems information, and management systems. In addition, there is Peer-to-Peer (P2P) energy trading project from the Solar Rooftop on buildings in the PEA headquarters area.

Core business

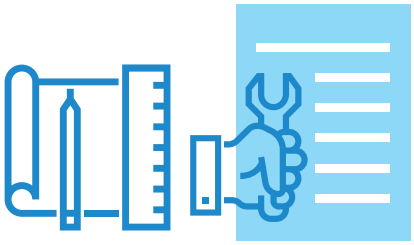


Procuring power supply from power producer network system and distributing to various groups of electric power users though four regional agencies in North, Northeast, Central, and South regions.

- Provide a Strong Grid Development Plan.
- Develop eletrical systems to support the Smart Grid system.
- Develop Third-Party Access (TPA) services.
- Improve the process of meter reading (Billing).
- Provide a key account relationship plan and use a Digital CRM system to support customer service.

Business continuity consists of

Related Business



Supportive business that enhances PEA's power distribution service both domestically and internationally or support PEA's customer service such as construction work for users, inspection, repair and maintenance work, and asset rent or utilization.

- Specify traget and metrics to relevant agencies.
- Provide strategies for related business services.
- Allocate resources in accordance with business operations, such as budget, human resources, tools, organizational structure, etc.
- Follow up and analyze the performance of services.

New Business

Service business in response to rapidly changing technologies (Disruptive Technology), such as Electric Vehicle, Solar Rooftop, Smart Meter, Smart Home, etc.

- Study internal and external factors related business.
- Establish scope, business guidelines, and a business model.
- Study the feasibility of new business and provide a business plan to propose to management approval.
- Improvement/ development of new business services, such as PEA HERO platform development.
- Follow up, evaluate, and summarize the performance.

Outstanding Performance

Obtained corporate credit rating at **"AAA"** level for the 4th consecutive year from 2018 – 2021

Return On Asset (ROA) was **2.98**
Net Profit Margin was **2.90**

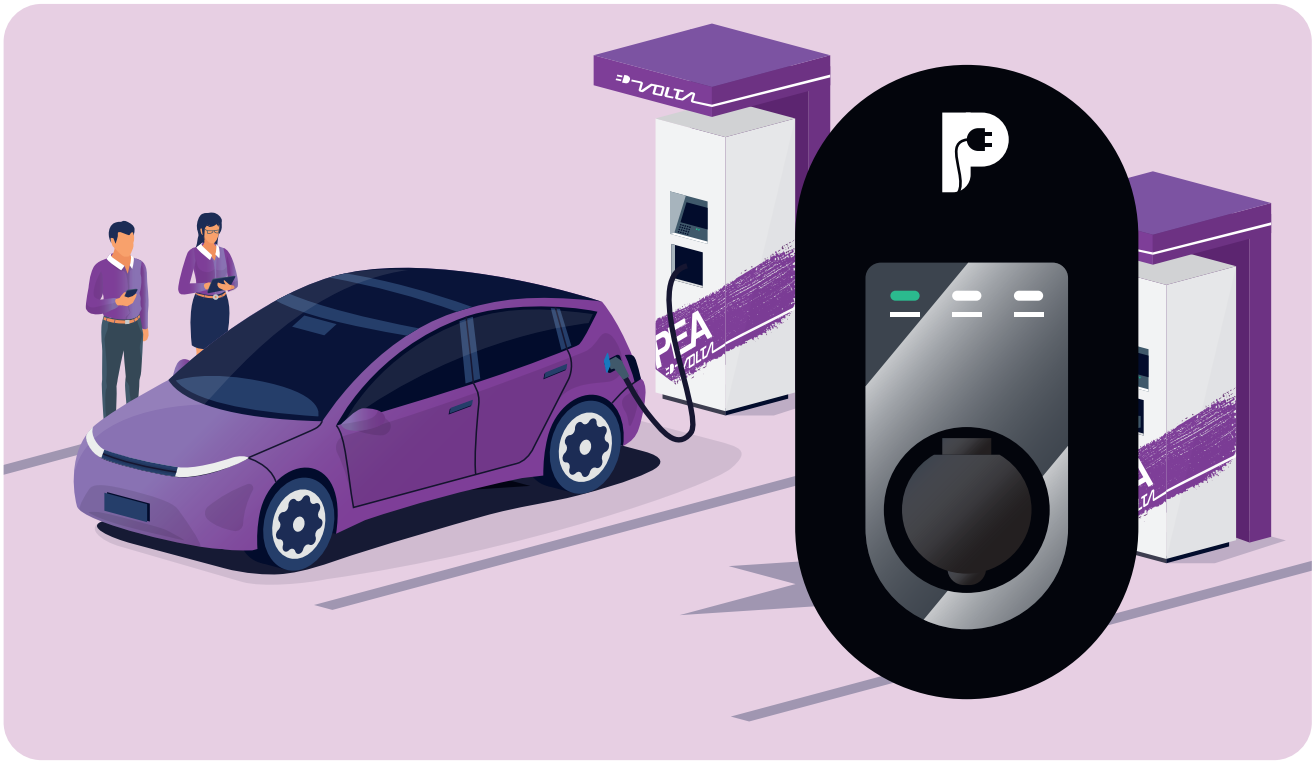
Current Ratio was **1.46**
Total Assets Turnover was **1.08**

Percentage of loss in distribution system was **5.45**

Total revenue [201-1] was **509,368.53 million baht**
Economic value distributed was **502,614.45 million baht**
Economic value retained was **6,754.08 million baht**
Revenue increased **3.93%** compared to the previous year.

PEA's new businesses

- A platform for providing PEA Care and Services is a business operation of the PEA with a smartphone application called "PEA CARE & SERVICE". It has 2 services, including indoor electrical inspection services and air conditioning cleaning service, which those services are operated by technicians trained or certified by PEA. Customers can choose the service and schedule the service 24 hours a day via the platform. The revenue from this business consists of service changes and product fees in the Care and Services Application.

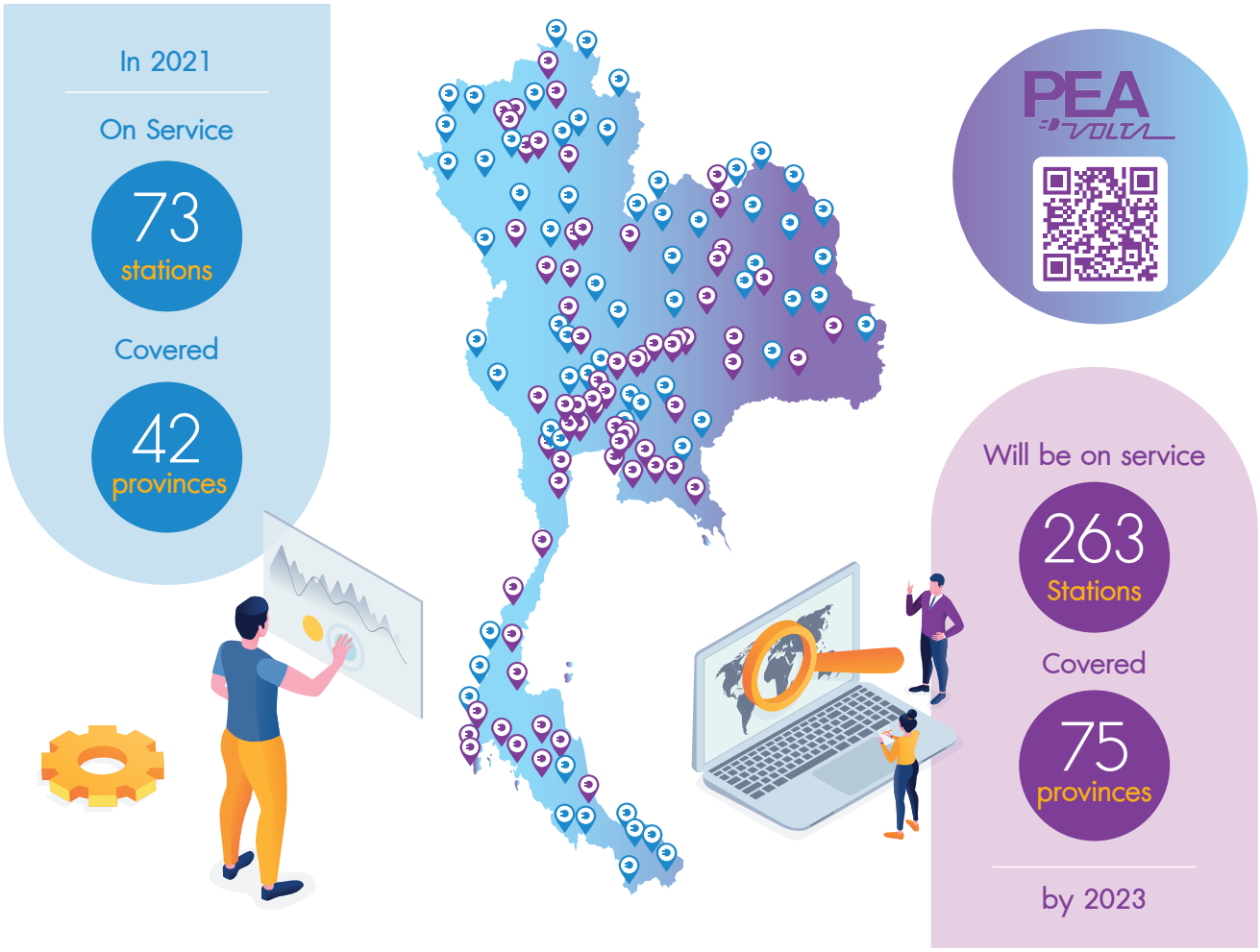


- **PUPAPLUG Business** is an innovation as a socket for the electric vehicle that can use in conjunction with the charger supplied of the electric vehicle. Utility of PUPAPLUG can be applied to both the driver's side of the electric vehicle and the entrepreneur side by transformation empty spaces into electric vehicle charging stations. PEA has cooperated with Scenery Technology Co., Ltd. to produce PUPAPLUG products. Currently, it is processing of customers preorder, which can order and pay at a price of 6,500 baht / device (including VAT). There are many customers interested in booking products, both general people and various business sectors such as hotels, resorts, condominiums, etc. If interested, you can find more details at https://www.pupaplus.com/

- **PEA VOLTA Charging Station Business** provides PEA VOLTA charging stations to support charging services (Fast Charge or Quick Charge) for electric vehicles along main roads across the country and major tourist attractions. In 2021, 73 charging stations have been on service. PEA recognizes income in 2 categories 1. Customers prepaid (Jan - Dec 2021) was 3,466,547.11 baht (including VAT), and 2. Charging service (Jan. - Dec. 2021) was 2,364,788.03 baht (including VAT).

Information channels for PEA VOLTA Charging Station

- https://www.facebook.com/peavolta
- @PEAVOLTA
- PEA VOLTA Application
- 1129 PEA Contact Center
- www.peavoltaev.pea.co.th



- New structure of electricity trading market business “Peer-to-Peer Energy Trading” or a system for purchasing electricity among people and people or between renewable energy power plants and surrounding communities. This will reduce the loss of electricity in the transmission line and reassure the public. In 2021, PEA has studied blockchain technology to support “Peer-to-Peer Energy Trading”.
- Develop the competence and expertise of employees in business operations through activities such as a business model contest at the departmental and central levels.

Improvement Plan for Future Operation (3-3)

- In 2022, PEA expects to open 90 additional PEA VOLTA charging stations and 100 more charging stations in 2023. PEA will complete EV charging station network as targeted totaling 263 stations by 2023.
- Increase the efficiency of asset utilization, such as the adoption of Enterprise Asset Management (EAM) Software to obtain asset management certification (Asset Management Standard: ISO 55000) in 2022.
- Integration of databases and systems for complete customer support (Fully Completed CRM), for example, developing customer relationship management systems on Smart Phones (CRM Mobile Workforce and PEA Smart Care) to create benefits in customer service. Making market, customer Data Analysis and other services that meet the needs/expectations of future customers to generate revenue for PEA.

PEOPLE

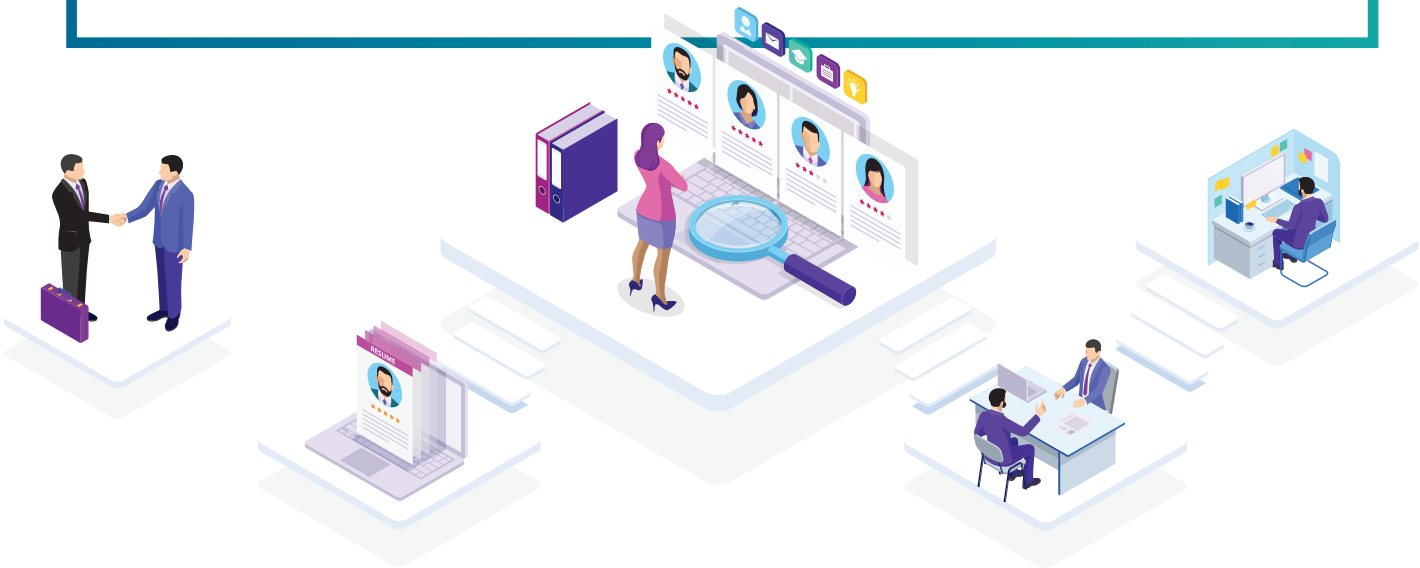
Equal treatment of employees (3-3)

Employees are the key to driving an organization's operations. The PEA is committed to treating all employees equally, and non-discriminatory by focusing on manpower planning, the recruitment, and selection process which will emphasize knowledge, competence, intention, and the potential to drive the organization toward sustainability. Moreover, PEA attached great importance to compensation management and employee retention, resulting in the conduct of an audit and risk assessment in each work line on forced labor, child labor, and gender discrimination, as well as creating a safe environment conducive to health and well-being. This leads to satisfying all employees' needs and expectations, providing employees with morale until their retirement, and enhancing the satisfaction and engagement of employees.

PEA believes that if employees and workers are happy at work for the organization, it will result in higher work efficiency. At the same time, PEA will be able to make employees remain loyal and can induce higher profits for the organization. This allows customers to receive excellent products and services while supporting the sustainable growth and development of the organization.

Target (3-3)

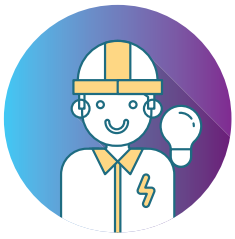
- Reduce discrimination complaints against the personnel recruitment and selection process.
- Increase the level of satisfaction of new employees with the recruiting and selection process as well as the level of supervisor's satisfaction with new employees.
- Reducing the employee turnover rate.
- Promoting employees' sense of belonging and commitment to the organization.
- Personnel development training to be aware of non-discrimination and also training to deliver employees with knowledge, abilities, and determination to work for PEA in the digital age.



Strategy (3-3)

- Operate strictly in accordance with PEA's compliance policy.

- Developing criteria such as recruiting, selection, and salary advance to be equitable. Provide rewards such as outstanding employee and best worker awards to establish guidelines regulating the salary deferral process and the selection committee specify the suitable criteria to avoid discrimination in the selection.
- Adherence to the law by pursuing human rights policy and supporting the investigation and avoidance of human rights violations, especially on women and children, people with disabilities, indigenous peoples, and migrant workers.
- PEA has a policy on benefits and welfare for employees and workers as well as constantly monitoring and improving with the relevant regulations. PEA operates under the State Enterprise Labor Relations Act such as not supporting forced labor, anti-child labor, monitoring and complying with international standards while respecting the employee's right to express their professional opinion.
- Promote awareness of diversity in workplace as well as planning of collaboration between agencies or individuals to be expanded and applied with employees at all levels.
- Organize activities to create a positive working environment and positive experience for employees and workers throughout their time working at PEA which will promotes employee well-being, a strong sense of self-worth, and the willingness to do the best work for PEA.



Equal Treatment of Employees' Management Approach [3-3]

- Allowing equal employment opportunities with a transparent selection process regarding knowledge, abilities, and qualifications as essentials for the organization.
- Offering job opportunities for people with disabilities under diverse operation policies and guidelines. Giving those fair employment rights, and welfare equally to general employees to promote better quality of life for disability person.
- Promote employees following their eligibility without considering race, gender, religion, or other discrimination involved in the selection process.
- Corporate management aligns with the principles of good governance which highlights the rule of law, ethics, transparency, participation, responsibility, and cost-effectiveness in development and improvement of relevant regulations or practices.
- Carrying out supervision, training, notification, and communication to operate as the same standard throughout the organization. Organize a meeting to explain the practice guidelines covering all 12 areas and deliver media to broadcast to the employees.
- Allowing opportunities for employees to gather and organize the Labor Unity of PEA to act as representatives of the employee in negotiating with the employer and protecting the welfare and benefits of employees including advising members who were not been treated unfairly.
- Equip personnel with development training to encourage non-discrimination behavior in the workplace and enable constant learning for the development of personnel potential and continuous life quality improvement.
- Manage public relations and the media such as circular letters, banners on an intranet, video clips, and line open chat, and PEA email as a channel for inquiries. Organize a public forum on the performance following the plan at the line level/ office level/ provincial electric utility level via an online platform to exchange opinions, experiences and learn together to enhance engagement in each agency.

The Labor Unity of PEA

- Promote a good relationship between employees and employers and between employees.
- Support members throughout their complaints.

- Seek and protect their welfare and benefits related to the working conditions of employees.
- Cooperate to achieve efficiency and preserve the interests of state enterprises.

For employee management, PEA will evaluate employee satisfaction and engagement through the process as follows:

1. Cooperate woth the working group to conclude the satisfaction and engagement survey approach, besides improving the survey and propose to the working group for approval.

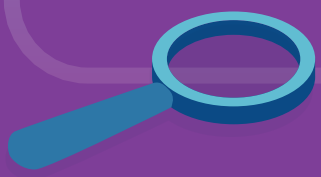
2. Provide more media to build an understanding and motivate survey responses by completing surveys though the online platform.

3. Interpret survey results and display information via the online platform within the organization.

4. Organize small group discussions and summarize qualitative information.

5. Arrange a meeting to inform the survey results with the agency responsible for the organization's work plan to determine the satisfaction enhancement plan.

6. Present the survey and operation result to the board of directors and relevant executive committee.



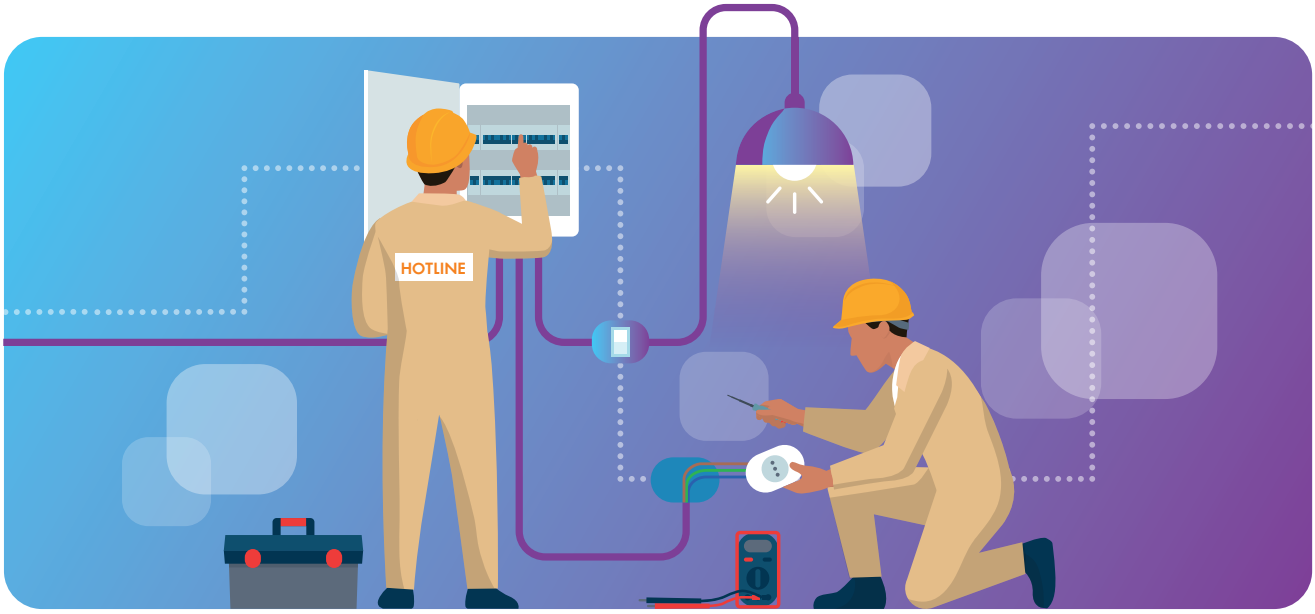
7. Complete the final report and the master infographic format to employee engagement the survey results at the corporate level.

Equal treatment of employees' Outstanding Performance

- None of unfair personnel recruitment and selection nor discrimination was detected. (406-1)
- The level of satisfaction in the personnel recruitment and selection process of new employee was 4.61 out of 5 points, at a high level.
- The average of employee commitment was 4.60 out of 5 points.
- The average of employee well-being was 4.53 out of 5 points.
- The level of employee sense of belonging was 4.60 out of 5 points.
- The willingness to do the best for work was 4.68 out of 5 points.
- The employee turnover rate accounted for 0.11% with a decrease from 0.02% in 2020.
- The worker turnover rate was 14.97% with an increase from 11.63% in 2020 due to the increase in the proportion of recruiting employees from the PEA's workers group.

Improvement Plan for Future Operation (3-3)

- Improving the resignation form and process by having a procedure or channel for supervisors and employees to discuss before taking resignation decisions and by allowing collection of resignation information for further analysis and solving employee care plans.
- Organize various forms of rights of equality and non-discrimination for public relations.
- Comparison of collected data with other agencies to make a practical plan in 2022.
- The employee satisfaction and engagement survey will aim at seeking the critical factors in assessing satisfaction through a focus group or in-depth interviews with employees and stakeholders. Then interpret to provide plans for enhancing employee's engagement as well as continuously creating a good experience in the future.



Occupational Health and Safety in the Workplace [3-3]

Apart from commitment to treat all employees equally and non-discrimination, the PEA also deliberates on building a safe environment conducive to health and well-being and motivating employees (Cultivate a Motivating Workplace Environment). There was an accident due to PEA's power system operations such as electric shock, falling from height, a car accident while working, and affect the employee loss of service in operation. Therefore, PEA is committed to reducing threats to health and the environment that affect employees' lives and properties. Emphasize safety, occupational health, and working environment of employees and considered as one of the critical factors that enable the operation of PEA drive efficiently. In this regard, PEA provides and develops the prevention of dangers that may occur during the work to be as comprehensive and secure as possible, both in terms of relevant law, regulations, and strategies of Thailand's safety support agency and international safety operating standards.

Target [3-3]

- The disability injury index measurement and reduces the threshold for injury by 5% every year.
- Reducing the number of accidents causing absence from work in 2021.
- Reducing the number of accidents causing fatalities from work in 2021.
- Reducing accidents rate causing absence from work in 2021.
- Reducing accidents rate causing fatalities from work in 2021.
- Continuously reducing work-related rates of sicknesses and diseases every year.
- Promote a safety culture and aim to zero accidents by setting the Disabling Injury Index (DI) as a criterion and collecting statistics of accidents that occurred with all sorts of electricity authority, PEA, and PEA offices in Head Office to provide a plan and prevent possible accidents.

Strategy [3-3]

PEA is committed to operating safety, occupational health, and working environment continuously to a minimum or eliminating accidents and incidences while operating strictly in accordance with PEA's Compliance Policy.

For PEA Master Plan 2021-2025, the objective of the SO1 strategy is to enhance integrated governance in a sustainable way and PEA has formulated an operating plan to enhance the process of safety following the international standard. Establish the standards and procedures that support safety operations as well as create a safety culture in the organization (PEA Safety Culture). PEA also has Occupational Health Safety and Environment Master Plan 2020 - 2024 to supervise under the concept of PEA Safety for All as follows: [403-6, 403-7]

1. Elevate the safety management system of PEA (PEA safety management system: PEA-SMS) as a standard for implementation throughout the organization as well as in public. Develop safety standards seriously and continuously aim to be an organization with an international safety management system.

2. Directors, employees, and operators of PEA must be aware and participate in elevating the occupational health, safety, and working environment including cooperation with the safety work network.

3. Budget and resources support on operations on occupational health, safety, and working environment.

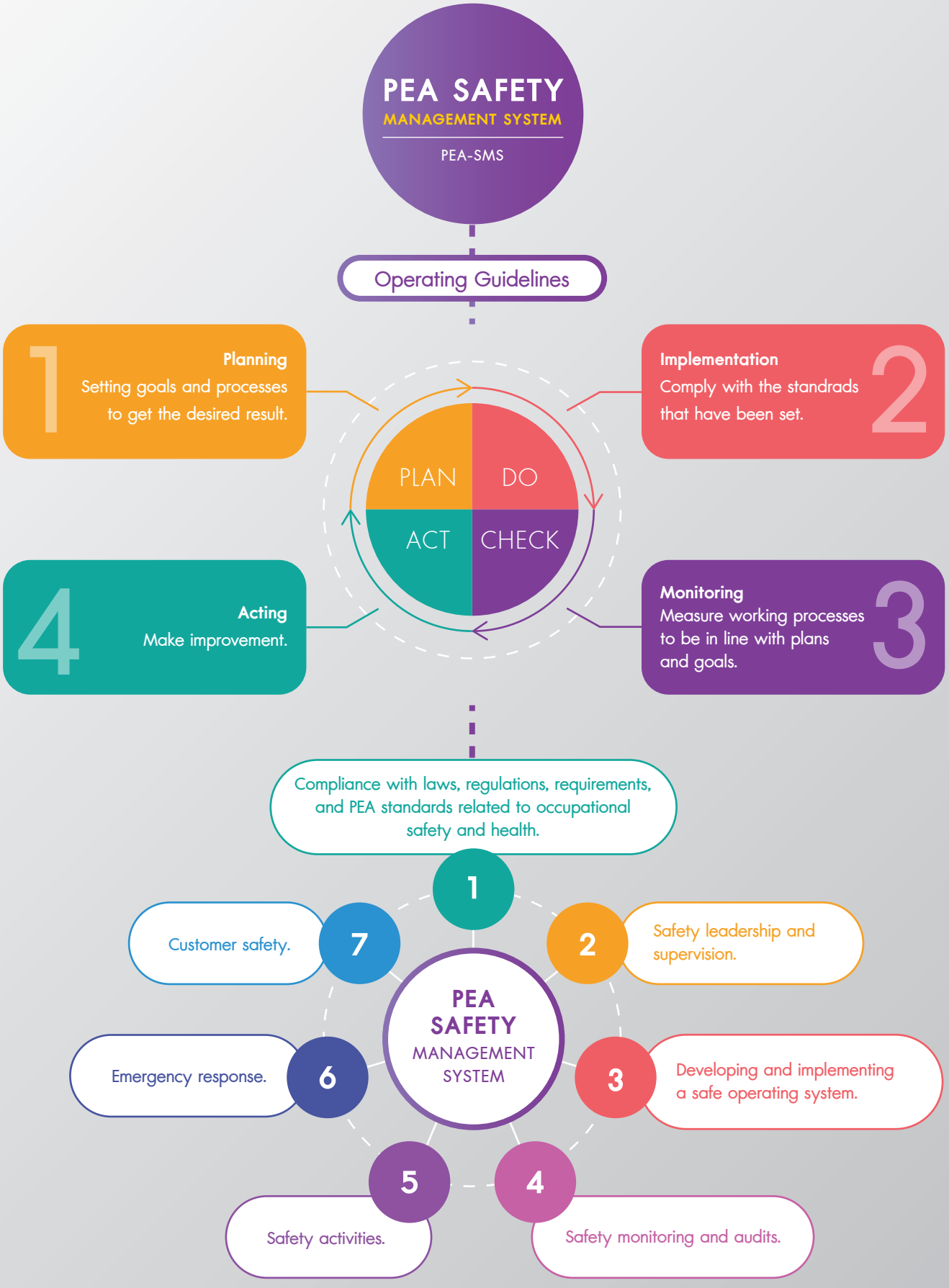
4. Expanding knowledge proficiency in occupational health, safety, and working environment. Also, enhancement (Up-Skill) and skill review (Re-Skill) in the operation line include encouraging the operators to pass the training under the law and the course prescribed by PEA.

5. Develop innovation and apply digital technology for better occupational health, safety, and work environment of the organization.

6. Focus on zero accidents and reduce the risk of sickness from work. Consider the procedures and standards of operation with safety first and strictly controlling both the performance and the operations of the contractors of PEA.

Moreover, PEA is dedicated to developing digital technology as a tool for overseeing operations that increase convenience and speed as well as decrease the risk of hazardous incidents to employees. PEA has developed the PEA safety management system (PEA-SMS). [403-1] PEA has developed the PEA safety management system (PEA-SMS) which is the standard for the occupational health, safety, and working environment approach. There are seven operational standards, covering compliance with applicable regulations or laws, operator, operating system usage, safety audit, activities emergency response, and the safety of people.

PEA Safety Management System (PEA-SMS) (403-2, 403-3)



Occupational Health and Safety's Management Approach [3-3]

Occupational health and safety strategies are put into practice by executing the action plan to support the operational goals for each strategy. PEA determines the person in charge, goals, and time frame in all activities and operate in accordance with PEA Occupational Health Safety and Environment Master Plan 2020 - 2024. PEA also developed the PEA Safety Management System (PEA-SMS) to conform to the Safety, Occupational Health, and Environment at Work Act, B.E. 2554 (2011) in pursuit of occupational health and safety management system certification (TIS 18001/BS OHSAS 18001) and prevent accidents covering employees, contractors, and consumers.

Construction of a working group to consider establishing a system for supervising work processes under the laws, regulations, occupational health, and safety practices related to employees, partners, contractors, and contractors, or the Occupational Health, Safety and Working Environment Committee, Headquarters. [403-4]

PEA has a safety culture with weekly safety talks before beginning work and applies the KYT safety training system to manage accidents caused by employees while working. KYT is a method for analyzing or predicting the potential hazards at work as well as establishing measures or procedures for managing those hazards to ensure safety. PEA also conducts training and development courses to promote safety with follow-up and measurement in order to continually improve the training courses.

Employees communication channels to operate safety management (403-4)

Communication channel	Frequency	Relevant person
1. Employees		
• Meeting to report on the Disability Injury Index (√DI)	Once a quarter	PEA (Area) Safety and Occupational Health Section
• Health and safety subcommittee meeting	At least Once a quarter	Assistant Governor (Organization Management-Human Resource) as a chairperson
• Accident prevention committee meeting	Once a quarter	- PEA Governor as a chairperson - Deputy Governor and Assistant Governor of 12 areas and related parties as a committee
• Occupational safety, health, and environment committee meeting	Once a month	Technical Officer (Safety Officer, Professional Level) as a meeting secretary, Deputy Governor (Organization Support) as a chairperson for head office and Assistant Governor area as a chairperson for PEA (Area), and Manager of PEA as chairperson for PEA Office
2. Contractors		
• Training on safety awareness for operation	4 courses per month	Technical Officer (Safety Officer, Professional Level)

Occupational Health and Safety's Outstanding Performance

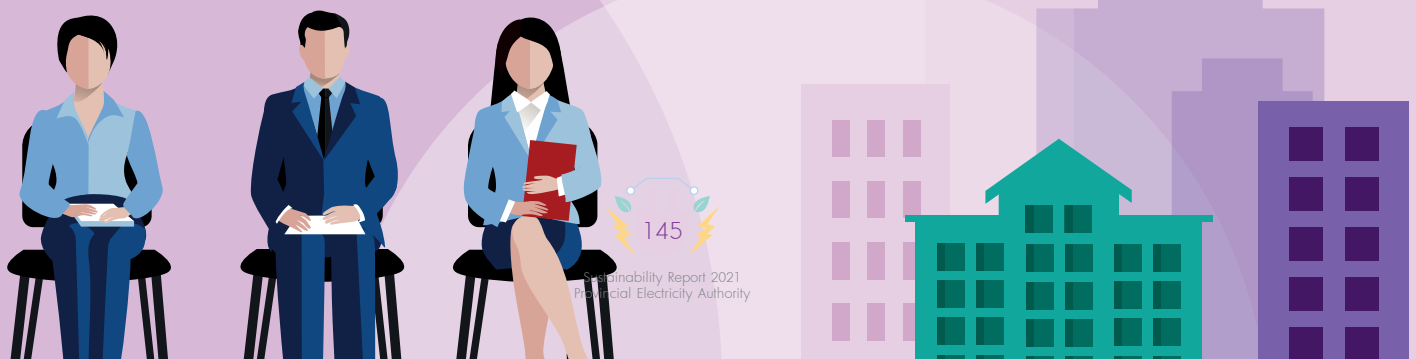
- TIS 18001 standard has been certified for the 12 additional PEA offices.
- The success of safety and occupational health operation was rated at 100%, with the goal at 100%.
- The Disabling Injury Index (√DI) was at 0.1663 at level 1 with the goal at 0.0929 out of level 5.
- Occupational health and safety training was divided into courses in engineering techniques and types of law, 178 employees and 275 workers of PEA were participating which represented 0.766 percent of all employees and workers. (403-5)

The Number of Employees/Workers Covered by an Occupational Health and Safety Management System (403-1, 403-8)

Employees/workers covered by an occupational health and safety management system					
Employees and workers		Workers who were not employees		Contractors	
Persons	%	Persons	%	Persons	%
29,492	49.91	6,489	10.98	23,106	39.11

Employees/workers covered by an occupational health and safety management system that is verified by the organization					
Employees and workers		Workers who were not employees		Contractors	
Persons	%	Persons	%	Persons	%
29,492	49.91	6,489	10.98	23,106	39.11

Employees/employees covered by occupational health and safety management systems that are audited or certified by external agencies.					
Employees and workers		Workers who were not employees		Contractors	
Persons	%	Persons	%	Persons	%
-	-	-	-	-	-



Work-Related Injuries (403-9)

Rates of fatalities and injuries	Number of the injury (by type of injury) (persons)				
	Burns	Electric shock	Vehicles	Falling from great heights	Other (specify), being hit by objects, slips
Fatalities and injuries (employees and workers)					
Work-related fatalities and injuries	0	4	0	0	0
Work-related high-consequence injuries (excluding fatalities)	4	5	6	3	3
Recordable work-related injuries (including fatalities)	4	9	6	3	3
Fatalities and injuries of workers who were not employees but whose work and/or workplace was controlled by the organization (contracted workers)					
Work-related fatalities and injuries	1	8	5	1	0
Work-related high-consequence injuries (excluding fatalities)	2	18	10	16	15
Recordable work-related injuries (including fatalities)	3	26	15	17	15

Total (persons)	Work Hours	Fatalities/ injuries (calculated based on 200,000 work hours)
4		0.01222
21	65,485,420	0.06414
25		0.07635
15		0.07134
61	42,052,920	0.29011
76		0.36145

Note: *The number of 200,000 or 1,000,000 working hours is the standard working hours according to OSHA (Occupational Safety and Health Administration) which is part of the United States Department of Labor and has administrated by the Assistant Secretary of Labor for Occupational Safety and Health. This standard is to set the same working hours across the organization (the number of working hours is usually different depending on each office). Thus, PEA decides to report the working hours equal to 200,000 working hours.*

Improvement Plan for Future Operation (3-3)

- Upgrading the occupational health and safety process to the ISO 45001 standard in the year 2022 for concrete products, hotlines, and electrical systems.
- Apply an innovation or modern technology to support the efficiency of occupational health, safety, and environment by using the WeSafe program which is to be used nationwide by 2022.
- Development of Personal Voltage Detector (PVD) for safety helmets for detecting leakage current points which can alert the operator.
- The development of safety innovations such as lifesaving rope and safety-harness to prevent falling from electric poles or high places while working and adjusted to have a hook that can be attached to the top of the electric pole.
- PEA-SMS (Online Platform) development as a tool for safety management by emphasizing the safety of contractors in charge of an electrical system, also testing the PEA-SMS Monitoring program.
- International standards review and upgrade certificate from TIS 18001 to ISO 45001, in two phases of goals as follows:
  - Phase 1: requesting approval for the part of concrete product and hotline (all 4 regions, 1 place per region).
  - Phase 2: requesting a certificate in the field of electrical systems.

Consideration of Electric Power User Health and Safety (3-3)

As electrical hazards caused damage to both lives and properties of electric users, the PEA acknowledges that the safety of electricity users is the most important issue. PEA is highly regarded for the operation of the electric power system, it must be secure, stable, certain, and harmless to our users. PEA has carried out surveys, improvements and records related to the safety of electric users, for example, the impact from PEA electric power systems on electric power users such as broken power poles, power poles falling, power lines close to the building, damaged power lines, electrical exploded and short circuit in the system. This data will be used to improve and develop a safe electrical installment procedure. PEA has also set standards to ensure public safety, such as safety distance standards for the electrical installment process. Providing knowledge to electric power users in various projects such as the PEA Safe Community Project for each district to instruct user on the safety of PEA's electric power system and advice on safety rules for working with electrical equipment. Regardless, if there is an accident or hazard from the electrical system, PEA has set approaches for managing the assessment and treatments for those who have been harmed. Additionally, assembling causes and possible risks of all accidents to enhance the electrical system and facilitate the health and safety of customers and communities in responsible areas as much as we can.

Target (3-3)

- Reducing user accidents from PEA electric power systems by 5%.
- The target impact of PEA electric power systems on electric power users is equal to 0.0262 (at level 5).

Strategy (3-3)

- Set a plan to inspect the electrical system in the responsible area (Safety Patrol).
- Adopting the occupational health and safety management system (TIS 18001) to monitor, inspect, and improve operations on safety matters continually.
- Solving problems of close spacing between power lines and buildings or structure following the PEA standard.
- Using the 7th standard of PEA-SMS (PEA safety management system) on user safety. Implementing in accordance with PEA's Master Plan on Safety, Occupational Health and Working Environment 2020-2024.

Regardless, PEA has set a policy on the health and safety of consumers in the Safety, Occupational Health and Work Environment Policy under the concept of PEA Safety for all. Enhance the safety management system (PEA-SMS) as a standard for work across the organization and safety for electrical users. Develop a safety culture strongly and constantly with an aim to be an organization that has an international safety management system, where all executives, employees and operators of PEA must acknowledge and participate in encouraging and supporting the operation.

Electric Power User Health and Safety's Management Approach (3-3)

Electric Power User Safety's Management Approach is detailed as follows:

1. Monitor and assess all risk areas that have the potential to affect electricity consumers at 100%.

2. Monitor and assess the safety standards configuration, its quality and the installation of equipment used in power transmission and distribution systems accountable for 100% of all products and services. The monitor will be annually reviewed and PEA in each area responsible for preparing a report on the planned remedial action result every 3 months. (416-1)

3. Random checks in every service area regularly. If there is any index that unmatched the operational guidelines or standards, it must be adjusted to be followed the standard. Furthermore, planned to correct or proceed with the workflow and inform the safety department for a further acknowledgment (Safety Patrol).

4. Operation complies with the safety, occupational health and working environment policies of the PEA. Review the results of the improvement by cases obtained from surveys or received complaints and fixing the distribution system that was undone. All services are performed by following the 7th standard of PEA-SMS (PEA safety management system) and PEA's Master Plan on Safety, Occupational Health and Working Environment 2020-2024.

5. Conducting public relations to inform electricity users on a notification in case users have noticed that the distribution system of PEA was uncertain or unsecured. The notification channels are 1129 PEA Call Center, Line Application, Facebook, PEA Website and the PEA office on your local. Additionally, organize a project to promote electric safety for the consumers as well.

PEA CARE &SERVICE

PEA CARE & SERVICE

(Digital Platform)

Comprehensive electrical maintenance service. Assemble of qualified technician team to fix household electrical issues which has passed PEA standard certification training. Easily available with 24-hours booking.

Implementation plan for managing the safety of electric power users

1

Developed a plan to inspect the electrical system in the area (Safety Patrol).

When an operation that does not meet the standards of PEA is detected, the relevant staff must inform the superior agency to request a budget and create plans for further improvements.

Voice-based Channel
1129 PEA Contact Center

2

PEA in each area reports the impact of electrical systems to the Division of Occupational Safety and Health of PEA.

Quarterly reports are as follows:
- The number and cause of the impact.
- Damages that PEA must take action.

3

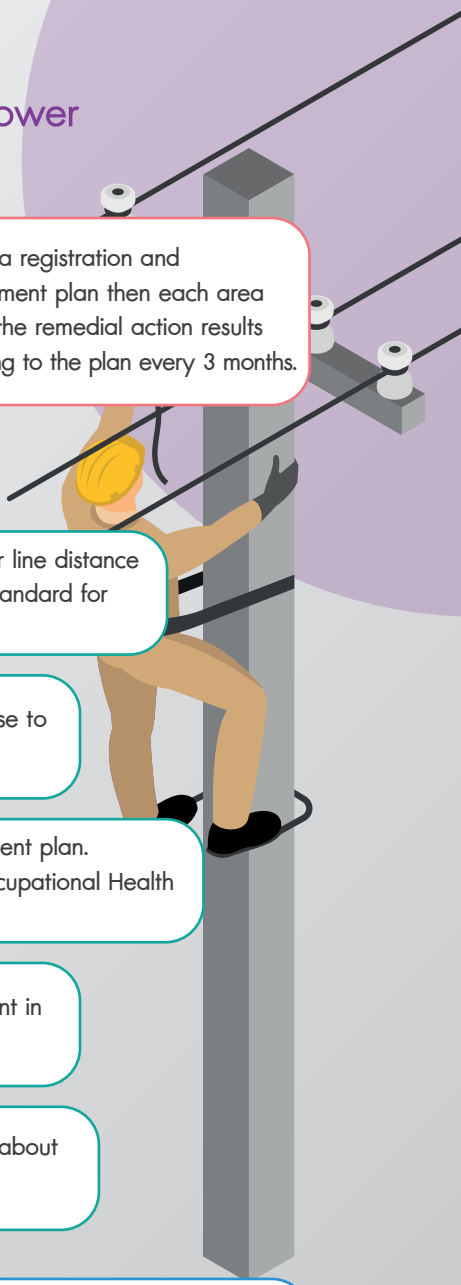
Submit the report to the meeting of the Accident Prevention Committee.

The Governor of PEA as the chairman and commander-in-chief of the 12 areas as a committee member to be informed in order to find solutions and create a prevention plan in the future.

Implementation plan for managing the safety of electric power users for each case

Power lines close to buildings or structure

- PEA conduct a high-voltage line survey in their responsible area. Checking on the power line distance from the building should follow the safety distance standard for construction and demolition site installations.
- Provide a registration and improvement plan then each area reports the remedial action results according to the plan every 3 months.



High voltage electrical injuries

- PEA conducts a high-voltage line survey on the power line distance from the building. Does it follow the safety distance standard for construction and demolition site installations?
- Provide action plans to improve high voltage lines close to building or construction every year.
- PEA in each area monitors the results of the improvement plan. Compile reports and send them to the safety and Occupational Health Division every 3 months to brief the governor.
- Regularly monitor/maintain power lines and equipment in the distribution system both high and low voltage.
- Equip public relations or campaigns to inform people about the dangers and safety of electricity use.

Electrocuted injuries

- PEA provides a survey on the power line distance from the building under the safety distance standard for construction and demolition site installations at least once per month.
- In case of power lines is close to the building or inconsistent with the PEA standards, those responsible for that area must take corrective action as soon as possible and report the results to the Division of Occupational Safety and Health every 3 months to determine appropriate measures then later report to the Governor.
- Regularly monitor/maintain power lines and equipment in the distribution system, especially during the monsoon season and in risky areas.
- Equip public relations or campaigns to cooperate with people if they notice any abnormalities in the electrical system as well as publicize the dangers and using electricity safely.

Electric Power User Health and Safety's Outstanding Performance

- Total number of complaints of non-compliance with regulations or voluntary concerning the health and safety impacts of PEA's electric power system in 2021. (416-2)

The number of complaints	All complaints have been resolved successfully.

The total remuneration, administrative expenses, or all humanitarian expenses were equal to 2,401,881 baht

- Power lines close to buildings or structure of 145 out of 222 places were fixed and improved. The details of operations to improve power lines close to buildings or structures in accordance with PEA standards were summarized as follows:

Particulars	Number (place)	Operation Budget (bath)
1. Improvement was done.	145	14,188,185.90
2. Budgets were approved, and operations were carried out.	10	2,327,028.36
3. The plan was created, and budgets were pending for approval.	12	405,335.00
4. Under the process of creating a plan.	55	674,609.00
Total	**222**	**17,595,158.28**

- The impact from PEA electric power systems on electric power users.

The number of accidents per consumer was equal to 8 times

The impact of uncertainty in the system on consumers. was equal to 0.0039

Which was at level 5 accounting for 14.88% of the criteria at level 5

- PEA Safe Community Project to acquaint people with the value of energy efficiency and safety.

People and PEA's employees attended the PEA safe community project

The number of participants onsite in online platform was 595 personnel, and 600 personnel of participants onsite.

Improvement Plan for Future Operation [3-3]

- Increase the frequency of surveys on potential risk areas and urgently complete improvements of power lines close to buildings or structures in accordance with PEA standards and work plan

Access management of electrical system [3-3]

Access to electric power systems is considered an Infrastructure for both the public and business sectors to support the growth of business and industrial sectors in both urban and rural areas, achieve economic value, increase employment, reduce income inequality, and spread prosperity to the regions and rural areas. In addition, the allocation of the electricity system can be made equally for the people, especially people in remote areas to have a better life. Although access to electricity has positive impacts on the economic and social dimensions, expanding the scope of operations in some areas may have a slight negative impact on the environment. PEA paid attention on the impacts and conducted an environmental impact assessment and defined measures before the operation on a regular basis.

Target [3-3]

- Expanding the electrical system for 141,960 households without electricity.
- Expanding the electrical system in agricultural area where need electricity for 16,500 Farm owners.

Operational strategies (3-3)

• Expanding the electrical system to meet the demand of the people and spread to all remote areas such as rural areas, islands, and areas outside the grid, etc.

• Implementing other projects to increase access to the electrical system, such as a project to reduce the burden of electricity, etc.

• Developing the potential of the Smart Grid distribution system.

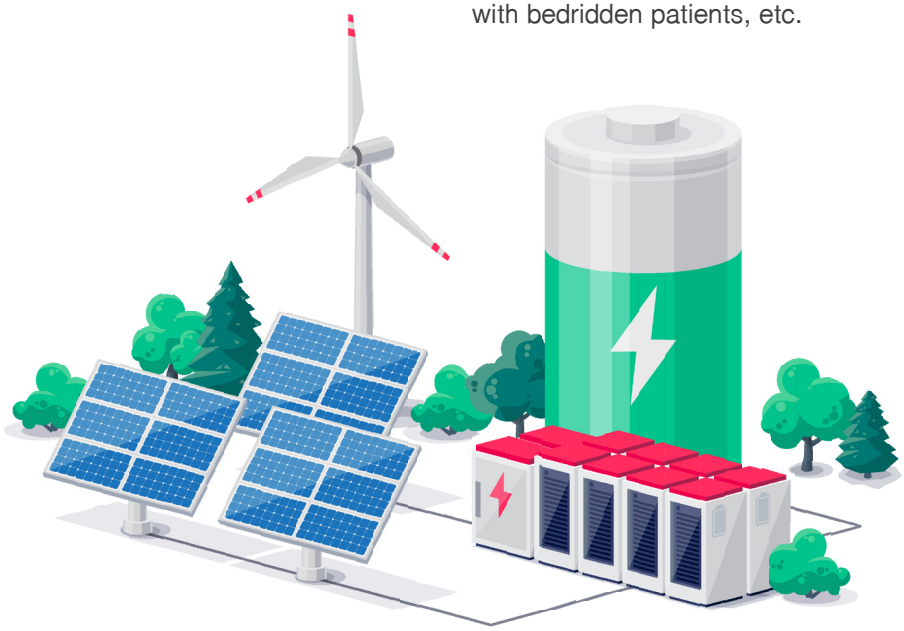
Management Approach (3-3)

• Implement New Rural Households Electrification Project (phase 2) to increase the electrical service area. Households included in the Project must have qualifications such as permanent household registration, not located in any government restricted area, etc.

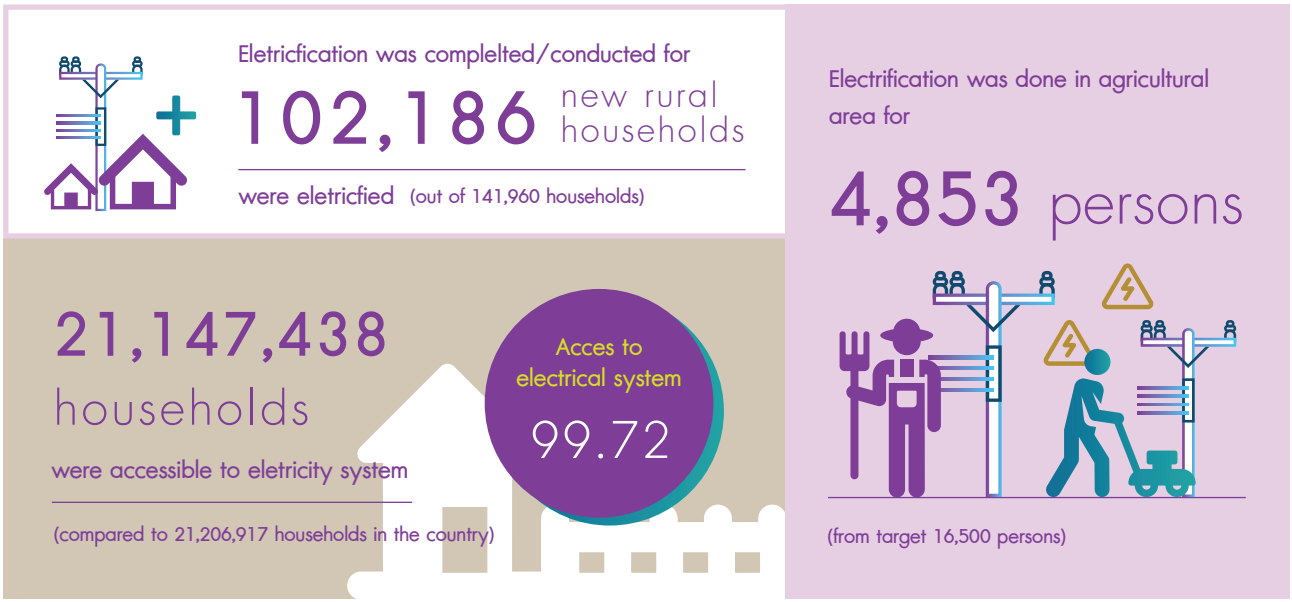
• Implemented Accelerated Plan to Extend Distribution System for Agricultural Area (2021-2022) (phase 2, 2021-2022) to support the electricity consumption of farmers, reduce production costs, and mitigate expenses during the COVID-19 outbreak. Farmers who request the system extended to their land must meet the criteria and qualifications as specified by the project.

• Develop Renewable Energy (RE) or Micro-Grid to generate electricity for households located in restricted areas, remote island areas, or other areas located outside the power grid by setting up a cable pole. PEA has classified residents, customers/ households, into 2 groups including 1) residents that are not located in the first watershed areas. PEA will operate by renewable energy as Mini-Grid, 2) residents that are in the first watershed areas. PEA will operate using a Solar Home System.

• Implemented Projects to help low-income customers or vulnerable groups for their better accessing to electricity. The Free Electricity Consumption Project was implemented. During February-June 2021, the first free 90 units of electricity consumption was provided for type 1.1.1 users (residents) and the first free 50 units of electricity consumption was provided for type 2 users, small businesses excluding government agencies and state enterprises. The project was continuously conducted in July - December 2021 that the first free 100 units of electricity consumption was provided for the users. In addition, there was a measure of electricity fee reduction for type 1.1.2 users, residential houses, and a measure that do not cut off electricity for households with bedridden patients, etc.



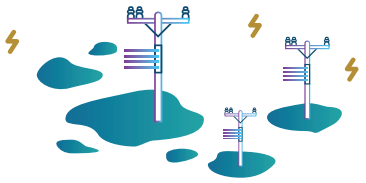
2021 Outstanding Performance



• PEA has studied the suitability of electrical system development projects on 12 islands, namely Kham Yai, Chik, Phayam, Lon, Por, Hang, Mak Noi, Lipe, Nok Tapao, Katen (Taen), Mai-Pai and Chang. Currently, the feasibility study report of Chik island project is under submission for approval from PEA committee. The Initial Environmental Examination report (IEE) has been finished for Kham Yai island project and other 10 islands projects are in the process of studying the environmental impact and comparing suitable investment options. In addition, PEA is studying feasibility of electrical system reinforcement by submarine cable to electrified 4 additional islands, namely Si Chang, Samet, Kho Khao, and Phi Phi Don.

Provide electrical system development projects on **12 unelectrified islands and will expand the submarine cables to 4 additional islands.**

Total 16 islands



Improvement Plan for Future Operation (3-3)

• In 2021, the electrical system expansion plan for unelectrified households (Solar Cell) has been conducted in the pilot area of Mae Hong Son province by selecting 5 villages, namely Ban Huai Hung, Ban Sao Hin, Ban Mae Samong Tai, Ban Sala Chiang Tong and Ban Sampeng Tai. The plan is currently in the process of requesting permission from the area owner which is expected to be granted and will be completed by 2022.

• Continually expanding the electrical system to complete the target of 141,960 new households by 2023 (2018-2022), as well as preparing a plan to expand the electrical system for the increasing households in the future.

• Expanding the electrical system to unelectrified households using renewable energy for 238 households in 2021 and will expand to approximately 18,659 households by 2025.

PLANET

Greenhouse Gas Emission (3-3)

The PEA's primary business focuses on the distribution and service of efficient electric power through various operational processes that necessarily require the continuous use of natural resources and energy in various forms, both directly and indirectly. These are the main factors of greenhouse gas emissions into the environment that contribute to climate change, which are currently important and urgent national and international issues. Furthermore, these can impact the environment, society, people, and the long-term sustainability of PEA's operations.

The PEA recognizes the significance of this issue and is committed to being environmentally and socially responsible by participating in the greenhouse gas emissions reduction and contributing to effective reduction measures. Moreover, we defined energy consumption management, monitoring and analyzing any operational problems or vulnerabilities to drive and control for more potential. However, PEA has considered the operation impacts from the power generation process, the transmission of electricity, and the distribution of electricity to consumers. In addition, PEA also thoroughly communicates the significant operations and outcomes to internal and external stakeholders through multiple communication channels. Additionally, PEA openly receives and listens to opinions from various stakeholders by providing communication channels and bringing recommendations to evaluate and improve the efficiency of the organization's greenhouse gas emissions management.

Target (3-3)

- The PEA can perform an eco-efficiency assessment and obtain a level 5 criterion for proving PEA's efficiency in using various resources and ability to regulate greenhouse gas emissions from PEA's business activities, as determined by the State Enterprise Policy Office (SEPO).
- Improvements in chiller system efficiency result in a 579.962 tCO_2e reduction in greenhouse gas emissions.
- Green Offices Policy implementation result in a 200.00 tCO_2e reduction in greenhouse gas emissions.

Strategy (3-3)

The PEA applied the National Economic and Social Strategic Plan No. 12, 2017-2021, to achieve the objective of raising PEA's greenhouse gas emission reductions and returning more value to society and the people, comprising:

1. Enhancing the efficiency of energy and resource consumption sustainably, covering from the corporate level and corporate partners to the level of electricity consumers that consist of the Greenhouse Gas Reduction Management or ISO14045 standards and according to the criteria set by the State Enterprise Policy Office (SEPO).

2. Carbon balance development to be a low-carbon organization utilizing Thailand Greenhouse Gas Management Organization's GHG offset measure (Public Organization).

3. Educating organization personnel and partners to raise awareness of the effects of climate change problems, resulting in changes in the behavior of personnel and stakeholders at all levels.

Management Approach (3-3)

Eco-efficiency Assessment

Eco-efficiency evaluations are employed to assess the effective use of various resources within the organization that generates greenhouse gases into the atmosphere. The PEA has developed a working plan to consistently regulate and monitor its performance to achieve the State Enterprise Policy Office's 2021 eco-efficiency indicators, set at level 5, or an eco-efficiency (Factor X) of 1.0486.

Additionally, the PEA utilizes the assessment results to develop approaches to improve eco-efficiency in the next phase, providing information to government authorities about the organization's plans to improve eco-efficiency and conform with the country's policies and priorities. This assessment covers all of PEA's operations in supplying electrical services in all 74 provinces across the country.

Criteria for measuring the level of success in the implementation of eco-efficiency in 2021

Criteria Level	Value of Factor X
Level 1	Factor X = 0.9980
Level 2	Factor X = 1.0120
Level 3	Factor X = 1.0242
Level 4	Factor X = 1.0364
Level 5	Factor X = 1.0486

In 2021, the PEA has been monitoring and collecting data on the organization's resource and energy usage and greenhouse gas emissions monthly, using five environmental indicators from 11 main activities and resources. PEA also gathered information on the organization's economic indicator or the total number of power distribution units to determine the level of Factor X. The table shows the results of gathering the organization's consumption information for each indicator.

Economic Indicator

Activity	List of Usage	Quantity	Unit
Economic indicators	Power distribution units	143,899	million units

Environmental Indicators

GHG Emission Indicator	List of Usage	Quantity	Unit
1. PEA's electricity generation	Diesel fuel	8,122,485.33	liter
2. Maintenance of power stations, electrical systems, and engineering	Transformer oil	1,683,400	liter
	Sulphur Hexafluoride, SF6	480	kilogram
3. Production and electricity pole usage	Self-made electric poles	22,542	ton
4. PEA's services	A4 paper	132,538	ream
	Thermal paper	6,351,278	piece
	Tap water	1,580,738	cubic meter
	Office electricity (302-1)	142,813,195	Kw/h
	Refrigerant leakage (R-12, R-410A, R-134a and R-32)	956.76	kilogram
5. Vehicle fuel consumption	Diesel fuel	19,780,029	liter

Green Office Policy

The Green Office Policy aims to encourage awareness among all employees in the using resources and energy efficiently, as well as raise workplace standards to eco-friendly operations that can minimize the rate of environmental negative impact, particularly in greenhouse gas emissions by annually monitoring and assessing the positive results that occur following the policy goals. Furthermore, the PEA set a goal for 2021 to expand the green office project to cover all of the country's power, increasing from 195 in 2020 to 210 offices.

The PEA has communicated and publicized the policy comprehensively through various channels, such as Green Office website, and has organized the Green Day activities to raise awareness and disseminate relevant knowledge on the potential impacts of climate change on the environment, society, and business for employees at all levels in 2021. The following are the six essential components of the policy:

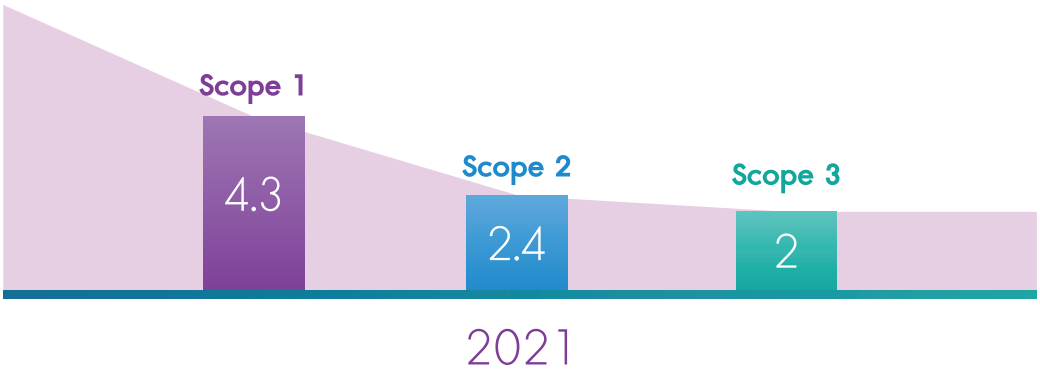
- Encourage all employees to follow the requirements for operating in an environmentally friendly office.
- Waste management and reuse initiatives to minimize greenhouse gas emissions caused by all office actitvities.
- Communicate and raise environmenttal awareness among executives, employees, and public by engeging them in suitable activities and channels
- Encourage regular monitoring of the working area to make a positive, secure, and comfortable working environment.
- Create awareness of resources and energy consumption to maximize efficiency and benefits.
- Promote the procurement of products and services as environmentally friendly.

2021 Greenhouse Gas Emission Performance

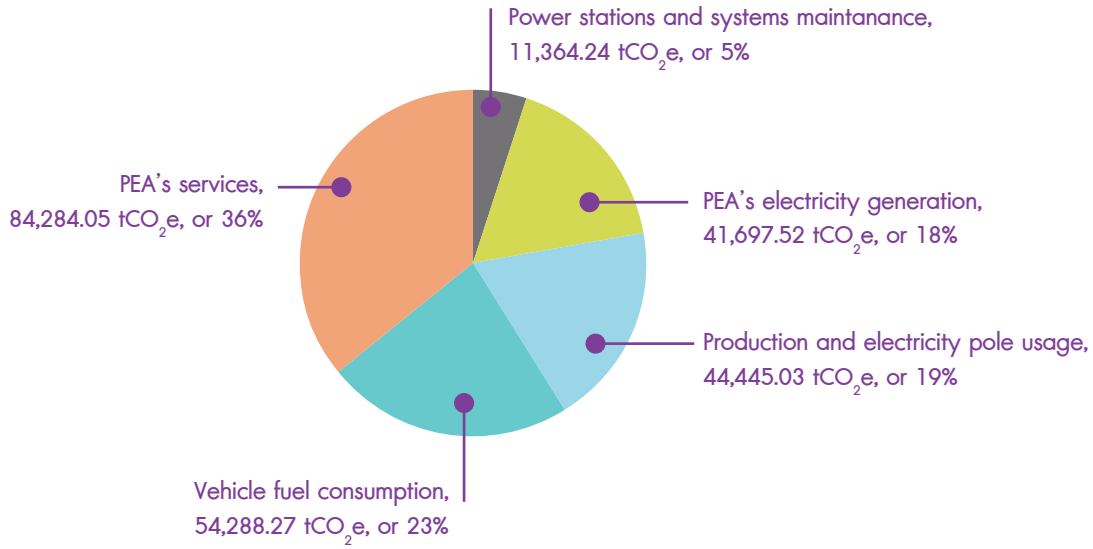
Eco-efficiency Assessment

To continue improving the potential of resources used in various organization activities and to achieve goals in terms of reducing greenhouse gas emissions and the determined eco-efficiency goal, the data on important indicators of The PEA's environment by resources used in 11 items are collected and used to assess and report on the total of greenhouse gas emissions monitoring results monthly. As a result, PEA's overall greenhouse gas emissions from its five primary business operations were 236,079.11 tons of carbon dioxide equivalent (tCO_2e), and the scope of its carbon footprint emissions could be divided into three scopes (305-1, 305-2, 305-3), as shown in the charts.

GHG Emission (tCO_2e)

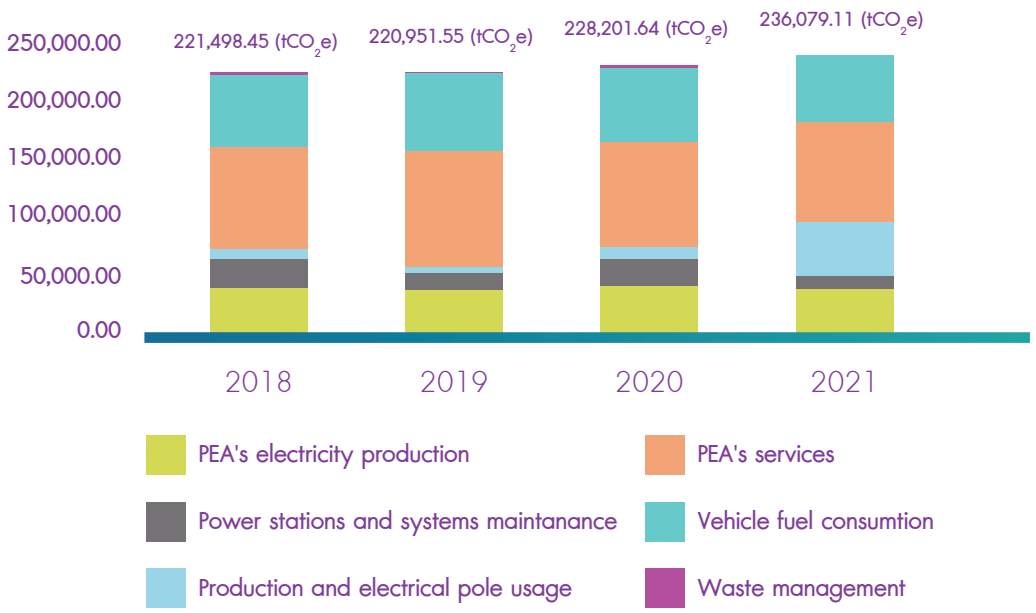


The assessment of the amount of greenhouse gas emissions in each of the main activities of PEA (tCO_2e)



When comparing the assessment results of the greenhouse gas emissions in 2021 to the results from the years 2018 to 2020, it was found that the total greenhouse gas emissions of the PEA tend to continuously increase from 2019 until 2021 since the promotion of higher vehicle fuel consumption from improved service efficiency. However, PEA has projects and activities to reduce greenhouse gas emissions, such as green office operations, installation of solar roofs in all PEA's offices, etc.

Comparative plot of greenhouse gas emission from mian activities of PEA



Remark: *Calculate total greenhouse gas emissions from six activities in 2018-2020, including the PEA waste handling. Due to its very small greenhouse gas emissions and insignificant in the assessment, there was no evaluation in 2021, however, the total outcome still tends to raise greenhouse gas emissions.*

Furthermore, the results of the 2021 assessment revealed that the activities with the highest levels of greenhouse gas emissions were, respectively:

- No. 1 PEA's services accounted for 36 percent
- No. 2 Vehicles fuel consumption accounted for 23 percent
- No. 3 Production and electric poles usage accounted for 19 percent
- No. 4 PEA's electricity production accounted for 17 percent, and
- No. 5 Maintenance of power stations, electrical systems, and engineering accounted for 5 percent

The PEA has used ranking results to develop a better resource utilization strategy to minimize total greenhouse gas emissions. As a result, PEA has already provided an action plan to minimize such impacts, especially with PEA's services in case of electrical consumption at PEA offices, and potentially reduce overall greenhouse gas emissions from this activity by 6,498.978 tCO_2e through three primary actions [305-5], including

• The PEA has installed solar power generating equipment in 204 places, reducing greenhouse gas emissions by 1,255.848 tCO_2e from the target of 1,200 tCO_2e.

• PEA's operations implementing the Green Office Policy can reduce overall greenhouse gas emissions by 5,234.13 tCO_2e from a target of 200.00 tCO_2e. Furthermore, the initiative has expanded the coverage of electricity entities throughout the country to 200 locations, above the objective of 210.

• The centralized air conditioning system (Chiller) improvements can reduce total greenhouse gas emissions by755.60 tCO2e from the target of 579.962 tCO_2e.

As a result, when calculating Factor X, or PEA's eco-efficiency in 2021, it was revealed that the result was equal to 626,792 units / 1 tCO_2e, which means that 626,792 units of electricity distribution caused 1 tCO_2e in greenhouse gas emissions, and when comparing to PEA's operating activities in 2018 (base year), PEA's operations were 1.0522 times more efficient than in 2018. On the other hand, PEA achieved the SEPO determination at level 5 criterion or factor X is 1.0486 by following the ISO14045 guidelines for providing the goal, scope of environmental assessment, economic value, and eco-efficiency evaluation.

Improvement Plan for Future Operation (3-3)

From the operating results in 2021, the PEA has utilized the results of the eco-efficiency evaluation (Eco-Efficiency) to develop guidance for enhancing operations and a greenhouse gas reduction work plan for the year 2022 as follows:

Improvement Plan for year 2023	GHG Reduction Target in (tCO_2e)
1. Transfer the vehicle fuel consumption of PEA's operation by transfer PEA's vehicle fuel use, which includes expanding E20, E85, and B10 consumption to 50 percent of all PEA vehicles.	2,000
2. Green Office Performing	1,000
Total GHG Reduction	3,000

Electric power user number forecast, Categorized by user types (EU10)

Information	Existing values	Forecasted values (Users)						
	2021	2021	2022	2023	2024	2025	2026	2027
Residences	18,757,812	18,734,495	19,103,952	19,465,991	19,828,612	20,192,701	20,560,486	20,930,009
Increase/(Decrease) percentage	2.45	2.32	1.97	1.90	1.86	1.84	1.82	1.80
Small businesses	1,720,379	1,716,504	1,759,515	1,805,512	1,854,476	1,906,763	1,960,643	2,015,369
Increase/(Decrease) percentage	2.32	2.09	2.51	2.61	2.71	2.82	2.83	2.79
Medium businesses	83,122	83,479	85,314	87,378	90,048	93,028	96,260	99,421
Increase/(Decrease) percentage	0.62	1.06	2.20	2.42	3.06	3.31	3.47	3.28
Large businesses	7,614	7,611	7,696	7,837	8,028	8,251	8,483	8,721
Increase/(Decrease) percentage	2.16	2.12	1.12	1.82	2.45	2.78	2.80	2.80
Specific businesses	11,941	12,471	13,247	13,956	14,452	14,856	15,266	15,687
Increase/(Decrease) percentage	(12.76)	(8.89)	6.22	5.35	3.55	2.80	2.76	2.76
Non-profit organizations	1,000	1,009	1,031	1,037	1,045	1,054	1,066	1,079
Increase/(Decrease) percentage	(5.93)	(5.10)	2.22	0.56	0.75	0.91	1.11	1.24
Water pump for agriculture	5,627	5,859	6,008	6,169	6,331	6,486	6,624	6,758
Increase/(Decrease) percentage	(4.16)	(0.20)	2.55	2.67	2.63	2.46	2.13	2.02
Temporary electric power	397,788	394,202	413,355	434,776	457,338	481,253	506,208	531,883
Increase/(Decrease) percentage	7.10	6.13	4.86	5.18	5.19	5.23	5.19	5.07
Total	20,985,283	20,955,630	21,390,120	21,822,655	22,260,330	22,704,394	23,155,037	23,608,927
Increase/(Decrease) percentage	2.51	2.36	2.07	2.02	2.01	1.99	1.98	1.96

Remark: *The forecast of all electric power users does not include free electric user types such as street and public lights.*

Power units sold forecast, Categorized by user types (EU10)

Information	Existing values	Forecasted values (Giga watt-hour: GWh)						
	2021	2021	2022	2023	2024	2025	2026	2027
Residences	38,519	37,892	38,547	39,442	40,432	41,525	42,590	43,691
Increase/(Decrease) percentage	3.64	1.95	1.73	2.32	2.51	2.70	2.57	2.58
Small businesses	13,964	14,058	14,443	14,904	15,420	15,998	16,558	17,138
Increase/(Decrease) percentage	0.38	1.06	2.74	3.19	3.47	3.75	3.50	3.50
Medium businesses	21,708	21,938	22,640	23,406	24,256	25,199	26,122	27,080
Increase/(Decrease) percentage	0.71	1.78	3.20	3.38	3.63	3.88	3.66	3.67
Large businesses	58,310	57,612	58,759	59,971	61,646	63,501	65,329	67,221
Increase/(Decrease) percentage	6.58	5.30	1.99	2.06	2.79	3.01	2.88	2.90
Specific businesses	2,530	2,498	3,495	4,044	4,451	4,642	4,764	4,889
Increase/(Decrease) percentage	(18.21)	(19.26)	39.94	15.68	10.07	4.30	2.63	2.63
Non-profit organizations	71	72	76	81	87	94	101	108
Increase/(Decrease) percentage	(0.20)	1.60	6.11	6.69	7.19	7.70	7.25	7.25
Water pump for agriculture	398	447	473	487	502	519	536	553
Increase/(Decrease) percentage	(4.59)	7.19	5.80	2.96	3.17	3.39	3.20	3.20
Temporary electric power	896	917	946	1,012	1,087	1,174	1,262	1,356
Increase/(Decrease) percentage	(3.17)	(0.91)	3.26	6.92	7.44	7.96	7.50	7.50
Total	136,396	135,433	139,380	143,346	147,882	152,651	157,262	162,036
Increase/(Decrease) percentage	3.45	2.72	2.91	2.85	3.16	3.22	3.02	3.04
Free electric power use	3,291	3,186	3,324	3,541	3,789	4,074	4,363	4,672
Increase/(Decrease) percentage	9.05	5.56	4.32	6.53	7.02	7.52	7.08	7.09

Purchased units forecast (EU10)

Information	Existing values	Forecasted values (Users)						
	2021	2021	2022	2023	2024	2025	2026	2027
Purchased Quantities from Electricity Generating Authority of Thailand (EGAT)								
Electric Energy (GWh)	136,255	135,098	138,913	142,815	146,940	151,388	156,141	161,089
Maximum Electric Power (MW)	21,282	21,282	21,315	21,707	22,339	23,017	23,729	24,471
Purchased Quantities from Department of Alternative Energy Development and Efficiency								
Electric Energy (GWh)	71.1	74.4	74.4	74.4	74.4	74.4	74.4	74.4
Maximum Electric Power (MW)	3.70	3.70	5.30	5.30	5.30	5.30	5.30	5.30
Quantities Generated by Provincial Electricity Authority of Thailand (PEA)								
Electric Energy (GWh)	87.0	93.3	93.3	93.3	93.3	93.3	93.3	93.3
Maximum Electric Power (MW)	4.56	4.56	6.33	6.33	6.33	6.33	6.33	6.33
Purchased Quantities from Very Small Power Producers (VSPPs)								
Electric Energy (GWh)	11,324	11,266	11,769	12,288	13,223	14,117	14,542	14,968
Maximum Electric Power (MW)	912	912	929	983	1,085	1,183	1,222	1,262
Total								
Electric energy (GWh)	147,737	146,532	150,850	155,272	160,330	165,672	170,851	176,224
Increase/(Decrease) percentage	3.55	2.70	2.95	2.93	3.26	3.33	3.13	3.15
Maximum electric power (MW)	22,202	22,202	22,256	22,702	23,435	24,211	24,963	25,745
Increase/(Decrease) percentage	6.00	6.00	0.24	2.01	3.23	3.31	3.11	3.13

Reference to the discrepancy of forecast data

With reference to the discrepancy in forecast data, the 2021 - 2027 forecast is a forecast for short-term electricity demand used to prepare the 2022 - 2023 budget of the PEA. The scope and assumptions used in forecasting electricity demand are as follows:

1) Thailand's economic projection from Gross Domestic Product (GDP) by NESDC on 19 August 2021. The Thai economy growth rate between 2020 to 2027 will decrease by 0.37% compared with figures of 5 June 2020 (the value of Thailand's budget estimation in 2021-2022).

GDP estimate	Exiting values			Forecasted values							Growth rate average (%)
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
5 June 2020	4.2	2.3	-6.1	4.5	3.0	3.2	3.5	3.7	3.5	3.5	3.57
19 August 2020	4.2	2.3	-6.1	1.0	4.0	3.2	3.5	3.7	3.5	3.5	3.20

2) Use of the Electricity Demand Forecast Model for Long-Term Energy Conservation, improved by the Faculty of Economics, Thammasat University, which consists of

2.1 End - Use Model from the Department of Alternative Energy Development and Efficiency (DEDE), and household appliance and building and controls factory survey data.

2.2 Econometric Model.

3) The Power Generation Forecast of Very Small Power Producers (VSPPs) is divided into two parts:

3.1 Existing projects and projects with government commitments. These are projects that already have a Commercial Operation Date (COD), projects that have a power purchase agreement and are waiting for a COD and projects that have already accepted the purchase of electricity (excluding the status of submitting a request, but not accepting the purchase) for PEA Self-Generation and the part that has been purchased by DEDE, taking into account the currently available value.

3.2 Alternative Energy Development Plan (AEDP).

4) Representative data of power generation characteristics of VSPPs (typical gen. profile) in 2018 from the results of the Dependable Capacity Factor study conducted by EGAT from March - May 2014, and the FIT data proposed by the EPPO to the NEPC in 2014.

5) Load Profile in 2017 will be determined as the base year due to electricity used data in 2018, was a subnormal value from the trade war between US and China. Electricity used data in 2019 was higher than usual due to higher temperatures.

6) Determination of the unit loss as 5.4% (five-year average) over the entire forecast year. The scope and assumptions used to forecast the number of electricity power users are as follows:

1. Calculation of the historical units of electricity used per user per year.
2. Forecast of units of electricity used per user per year, fixed for the entire forecast year.
3. Calculation of the forecast value for the number of electricity users with an energy demand forecast per unit per user per year.

PEA Power loss

Type of loss	Percentage of power loss in transmission and distribution system				
	2017	2018	2019	2020	2021
Total target loss	5.28	5.18	5.20	5.54	5.40
Total loss	5.12	5.36	5.37	5.47	5.45
Technical Loss	3.81	3.83	3.96	4.11	4.02
Non-Technical Loss	1.31	1.53	1.41	1.36	1.43

Index of electrical system stability (SAIFI & SAIDI) (EU28, EU29)

Type of System Average Interruption Frequency Index (SAIFI) value and the System Average Interruption Duration Index (SAIDI) value	2017	2018	2019	2020	2021
Target value of SAIFI	4.61	3.86	3.17	2.74	2.25
Result value of SAIFI	4.50	3.81	3.10	2.65	2.19
Target value of SAIFI in 12 major cities	1.314	1.120	1.174	1.036	0.893
Result value of SAIFI in 12 major cities	1.232	1.174	1.036	0.893	0.661
Target value of SAIDI	118.85	87.08	75.78	57.58	44.80
Result value of SAIDI	118.70	89.82	73.82	57.52	44.51
Target value of SAIDI in 12 major cities	18.446	14.784	14.853	13.364	10.558
Result value of SAIDI in 12 major cities	16.528	14.853	13.364	10.558	8.522

Remarks: - *The SAIFI and SAIDI indices of PEA exclude the three southern border provinces.*

- *The SAIFI and SAIDI indices of 12 major cities include only electricity interruptions and blackouts, and performance of emergency work caused by the operation of protective equipment at the source station (circuit breaker).*
- *The target value of SAIFI and the target value of SAIDI come from the evaluation criteria for state-owned enterprises.*
- *The target value of SAIFI in 12 major cities and the target value of SAIDI in 12 major cities are provided by PEA.*

Direct Economic Value Generated and Distributed* (2-2, 201-1)

Detail of business	2018 (Million Baht)	2019 (Million Baht)	2020 (Million Baht)	2021 (Million Baht)
(1) Direct Economic Value Generated				
Revenues	499,253.86	519,767.94	490,109.53	509,368.53
(2) Economic value distributed				
Operating costs	451,684.60	475,679.05	453,831.40	469,500.88
Employee wages and benefits	23,849.55	27,397.41	22,264.78	21,961.61
Payments to providers of capital	2,903.44	2,657.44	2,740.18	3,061.99
Payments to government	13,350.00	6,715.00	7,300.00	7,854.00
Community Investment	262.09	739.36	777.17	235.97
(1) - (2) Economic value retained	7,204.18	6,579.68	3,196.00	6,754.08

** Economic performance is only reported by the PEA and its affiliates.*

The number of employees with disabilities in 2021

Framework for supporting the disabled	Female (persons)	Male (persons)	Total (persons)
Employees with disabilities	14	92	106
Provide projects and services locations for assisting people with disabilities or their caregivers	51	73	124
Total (persons)	65	165	230

Quality of life development project with electrical access (Former EU6)

Ongoing project	Objectives	Operation details	Investment Budget (Million Baht)	Targets	Operation results
Transmission and Distribution Development Project, 1st Stag.	To develop electrical system to efficiently distribute power supply and serve increasing demand.	- Construct 115 kV transmission lines system. - Construct loop lines - Construct 22/33 kV high-voltage distribution system. - Construct low-voltage distribution system.	62,678.71	PEA operates in 4 regions, each region divided into 3 area offices, with the total of 12 PEA area offices. Each PEA area office has its PEA province offices under its responsibility.	- Construct 115 kV transmission lines system (Project progress 76.78%, there are 910.63 circuit-km.) - Construct loop lines. (Project progress 52.4847.95%, there are 78.4854.52 circuit-km.) - Construct 22/33 kV high-voltage distribution system. (Project progress 88.64%, there are 6,017.82 circuit-km.) - Construct low-voltage distribution system (Project progress 100%, there are 3,353.00 circuit-km.) (Status at December 2021)
Expansion of electrical system to new household Project, 2nd Stage.	To expand the electricity system to new household thoroughly following the government policy.	- Expand the electricity services to 141,960 new households.	6,565	PEA operates in all unelectrified house-holds in PEA service area of 74 provinces.	- Expand the electricity services to 102,186 new households (Project progress 71.98%) (Status at February 2022)
Budgets for ongoing projects				**69,243.71 million Baht**	

Planned initiatives in the next 3 years	Objectives	Operation details	Investment Budget (Million Baht)	Targets	Operation results
Transmission and Distribution Development Project, 2nd Stage.	To develop electrical system to efficiently distribute power supply and serve increasing demand in the future.	- Construct 115 kV transmission lines system. - Construct loop lines - Construct 22/33 kV high-voltage distribution system. - Construct low-voltage distribution system.	77,334	PEA operates in 4 regions, each region divided into 3 area offices, with the total of 12 PEA area offices. Each PEA area office has its PEA province offices under its responsibility.	- The cabinet approved the transmission and distribution system development project on 26th May 2020. - In the process of constructing 115 kV transmission lines system. - In the process of constructing loop lines - Construct 22/33 kV high-voltage distribution system. (Project progress 5.43%, there are 576.43 circuit-km.) - Construct low-voltage distribution system (Project progress 38.57%, there are 20,549.30 circuit-km.) (Status at March 2022)
New Rural Household Electrification Project Phase 3 (NHEP.3)	To expand the electrical system to new household thoroughly following the government policy.	- Expand the electricity services to 128,000 new households.	6,500	PEA operates in all unelectrified house-holds in PEA service area of 74 provinces.	- In the process of preparing a project feasibility study report.

Planned initiatives in the next 3 years	Objectives	Operation details	Investment Budget (Million Baht)	Targets	Operation results
Electrical System Reinforcement by Submarine Cable to Electrified Island Project.	- To develop the electrical system to increase capacity and stability of power distribution on the island which is a significant tourist attraction and important to the economy. - To reduce the business loss due to power outage.	- Construct 22/33 kV submarine cable. - Construct the power distribution system on islands. - Improve the existing power distribution system on islands.	2,507	Increasing the stability of power distribution on islands and reliable distribution of electricity to serve increasing demand.	- In the process of preparing a project feasibility study report.
Power System Development on Islands Project.	To develop electrical systems to increase capacity and stability of the electricity supply to meet the demand of islands, tourist attractions, where have a relatively high economic growth rate.	- Construct 22/33 kV submarine cable. - Construct the power distribution system on islands. - Improve the existing power distribution system on islands.	6,630	Construct submarine cables to the islands to increase capacity and stability of the electrical system on the islands.	- In the process of preparing a project feasibility study report.
Budgets for planned initiatives in the next 3 years				**92,971 million Baht**	
Grand Total				**162,214.71 million Baht**	

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ABOUT THIS REPORT

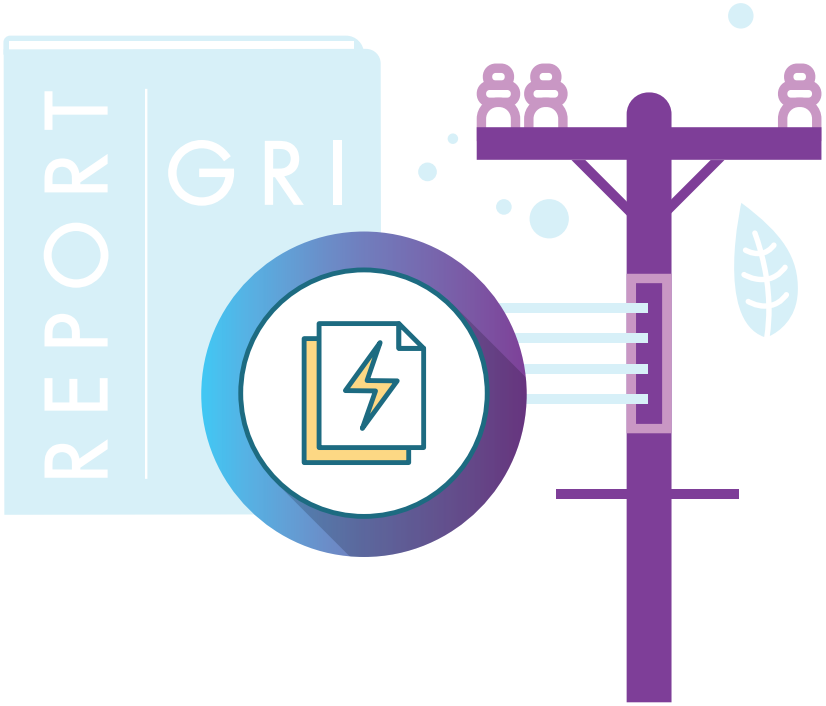
History of the Report (2-3)

The PEA has generated a sustainability report annually and continuously, which is the fifth edition. The sustainability report 2021 has been delivered in accordance with GRI Standards to disclose corporate sustainability performance in the terms of economic, social and environmental dimensions, with annual reporting period from 1st January to 31st December 2021. Moreover, PEA also has adopted the reporting guidelines of the Electric Utilities (EU) Group of the Global Reporting Initiative (GRI) to provide more clarity and relevance to business operations.

Additionally, in order to show our commitment to sustainable development, PEA has also linked its operations with the 17 Sustainable Development Goals (SDGs) of the United Nations and compiled them into this report.

Scope of the Report (2-2)

Disclosure in this report is showing the information and impacts of operations throughout the value chain of PEA with the reporting scope covering the head office, provincial sectors, power plants, and power stations, including relevant stakeholders. However, this performance excludes affiliates of PEA.



External Assurance for the Report

The Board of Directors and high-level executives of PEA have a role to play in monitoring, auditing, providing advice as well as approving important information disclosed in this report in order to ensure the inclusiveness and completeness of the content in the report and create shared values for all groups of stakeholders. (2-14)

Furthermore, in this report, PEA has assigned experts from the third party to verify and endorse to increase the confidence in the reporting process (External Assurance) in order to increase the credibility of the report and in accordance with the reporting guidelines of the GRI Standards. (2-5)

Upgrade of the Quality of the Report

All groups of stakeholders are able to comment on the sustainability report 2021 through the readers' questionnaire. Those opinions, PEA will analyze to apply in the development and upgrade for the further sustainability report in the future. This is to make the report more relevant and respond to the demands of stakeholders effectively.

Inquiry for information (2-3)

If you have any additional suggestions or inquiries for information, you can directly contact the Corporate Social Responsibility Department at PEA Head Office, LED Building.

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GRI

GRI Content Index

CONTENT INDEX ESSENTIALS SERVICE 2022

For the Content Index - Essentials Service, GRI Services reviewed that the GRI content index is clearly presented, in a manner consistent with the Standards, and that the references for disclosures 2-1 to 2-5, 3-1 and 3-2 are aligned with the appropriate sections in the body of the report. The service was performed on the English version of the report.

Statement of use	Provincial Electricity Authority (PEA) has reported in accordance with the GRI Standards for the period start 1 January and end of 31 December 2021.
GRI 1 used	GRI 1: Foundation 2021
Applicable GRI Sector Standard	Electric Utilities

GRI Standard / Other Source	Disclosure	Location	Omission	
			Reason	Explanation
General Disclosures				
GRI 2: General Disclosures 2021	2-1 Organizational details	21,33		
	2-2 Entities included in the organization's sustainability reporting	170, 175		
	2-3 Reporting period, frequency, and contact point	175-176		
	2-4 Restatements of information	-	Not applicable	No significant changes
	2-5 External assurance	176, 183-184		
	2-6 Activities, value chain and other business relationships	25, 27-31, 33		
	2-7 Employees	34		
	2-8 Workers who are not employees	34		
	2-9 Governance structure and composition	32		
	2-10 Nomination and selection of the highest governance body	40		
	2-11 Chair of the highest governance body	39		
	2-12 Role of the highest governance body in overseeing the management of impacts	42		
	2-13 Delegation of responsibility for managing impacts	42		
	2-14 Role of the highest governance body in sustainability reporting	42, 176		
	2-15 Conflicts of interest	41		

GRI Standard / Other Source	Disclosure	Location	Omission	
			Reason	Explanation
General Disclosures				
	2-16 Communication of critical concerns	46, 48-49		
	2-17 Collective knowledge of the highest governance body	43		
	2-18 Evaluation of the performance of the highest governance body	43		
	2-19 Remuneration policies	44-45		
	2-20 Process to determine remuneration	44-45		
	2-21 Annual total compensation ratio	-	Information unavailable	Data has not been collected. The report is expected to be reported by 2026.
	2-22 Statement on sustainable development Strategy	8-9		
	2-23 Policy commitments	82-85		
	2-24 Embedding policy commitments	82-85		
	2-25 Processes to remediate negative impacts	60-70		
	2-26 Mechanisms for seeking advice and raising concerns	46, 48-49		
	2-27 Compliance with laws and regulations	10		
	2-28 Membership associations	35		
	2-29 Approach to stakeholder engagement	93-101		
	2-30 Collective bargaining agreements	137		
Material Topics				
GRI 3: Material Topics 2021	3-1 Process to determine material topics	103-104		
	3-2 List of material topics	105		
Economic performance				
GRI 3: Material Topics 2021	3-3 Management of material topics	126-131		
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	11, 132,170		

GRI Standard / Other Source	Disclosure	Location	Omission	
			Reason	Explanation
General Disclosures				
Anti-corruption				
GRI 3: Material Topics 2021	3-3 Management of material topics	37-38, 53		
	205-1 Operations assessed for risks related to corruption	50		
GRI 205: Anti-corruption 2016	205-2 Communication and training about anti-corruption policies and procedures	50-51		
	205-3 Confirmed incidents of corruption and actions taken	51		
Advocate free and fair competition				
GRI 3: Material Topics 2021	3-3 Management of material topics	55-57		
GRI 206: Anti-competitive Behavior 2016	Disclosure 206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	-	Information unavailable	Data collection has not been collected because it is in the middle of a free electricity trade, so there is no mandatory law.
Reliability of the electrical system				
GRI 3: Material Topics 2021	3-3 Management of material topics	107-110, 113		
GRI Electric Utilities Sector	EU6 Management approach to ensure short and long-term electricity availability and reliability	108-110, 171-173		
	EU10 Planned capacity against projected electricity demand over the long term, broken down by energy source and regulatory regime	110, 165-167		
	EU28 Power outage frequency	111, 169		
	EU29 Average power outage duration	111, 169		

GRI Standard / Other Source	Disclosure	Location	Omission	
			Reason	Explanation
General Disclosures				
Access to the electrical system				
GRI 3: Material Topics 2021	3-3 Management of material topics	154-156		
	Number of new electricity users	156		
Customer health and safety				
GRI 3: Material Topics 2021	3-3 Management of material topics	148-154		
GRI 416 Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	150		
	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	153		
Customer privacy				
GRI 3: Material Topics 2021	3-3 Management of material topics	121-125		
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	11, 125		
Responding to Stakeholders				
GRI 3: Material Topics 2021	3-3 Management of material topics	93-101		
GRI 2: General Disclosures 2021	2-29 Approach to stakeholder engagement	93-101		
Greenhouse gas emissions				
GRI 3: Material Topics 2021	3-3 Management of material topics	157-160, 163		
GRI 302: Energy 2016	302-1 Energy consumption within the organization	159		
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	161		
	305-2 Energy indirect (Scope 2) GHG emissions	161		
	305-3 Other indirect (Scope 3) GHG emissions	161		
	305-5 Reduction of GHG emissions	162		

GRI Standard / Other Source	Disclosure	Location	Omission	
			Reason	Explanation
General Disclosures				
Occupational health and safety				
GRI 3: Material Topics 2021	3-3 Management of material topics	140-144, 148		
	403-1 Occupational health and safety management system	141, 145		
GRI 403: Occupational Health and Safety 2018	403-2 Hazard identification, risk assessment, and incident investigation	142		
	403-3 Occupational health services	142		
	403-4 Worker participation, consultation, and communication on occupational health and safety	143-144		
	403-5 Worker training on occupational health and safety	145		
	403-6 Promotion of worker health	141		
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	141		
	403-8 Workers covered by an occupational health and safety management system	145		
	403-9 Work-related injuries	146-147		
Non-discrimination				
GRI 3: Material Topics 2021	3-3 Management of material topics	135-139		
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	139		

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Independent limited assurance report

To the Governor of Provincial Electricity Authority ("PEA")

Conclusion

Based on the procedures performed, as described below, nothing has come to our attention that causes us to believe that the selected subject matters ("Subject Matters") identified below and included in the Sustainability Report 2021 (the "Report") for the year ended 31 December 2021 and reliability of Subject Matters, are not, in all material respects, prepared in compliance with the GRI standard as reporting criteria (the "Criteria").

Our Responsibilities

We have been engaged by PEA and are responsible for providing a limited assurance conclusion in respect of the Subject Matters for the year ended 31 December 2021 to be included in the Report below.

Our assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 *Assurance Engagements other than Audits or Reviews of Historical Financial Information*. These standards require the assurance team to possess the specific knowledge, skills and professional competencies needed to provide assurance on sustainability information, and that we plan and perform the engagement to obtain limited assurance on whether the Subject Matters are prepared, in all material respects, in compliance with the Criteria. We have complied with the independence and other ethical requirements of the International Ethics Standards Board for Accountants' *International Code of Ethics for Professional Accountants (including International Independence Standards)* (IESBA Code), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have not been engaged to provide an assurance conclusion on any other information disclosed within the Report.

Subject Matters

Subject Matters comprised of the following data expressed numerically or in descriptive text for the year ended 31 December 2021:

- GRI G4 (former EU6) Availability and Reliability
- GRI G4 (former EU23) Access

Criteria

The Subject Matters were assessed according to the following criteria:

- The Sustainability Reporting Standards of the Global Reporting Initiative ("GRI Standards");

Directors' and management's responsibilities

The directors and management of PEA are responsible for the preparation and presentation of the Subject Matters, specifically ensuring that in all material respects the Subject Matters are prepared and presented in accordance with the Criteria. This responsibility also includes the internal controls relevant to the preparation of the Report to ensure they are free from material misstatement whether due to fraud or error.

Procedure performed

In forming our limited assurance conclusion over the Subject Matters, our procedures consisted of making enquiries and applying analytical and other evidence gathering procedures including:

- Interviews with senior management and relevant staff at corporate and operating sites;
- Inquiries about the design and implementation of the systems and methods used to collect and process the information reported, including the aggregation of source data into the Subject Matters;
- Inquiries about managements practices and procedures related to identifying stakeholders and their expectations, determining material sustainability matters and implementing sustainability policies and guidelines;
- Site visit to 1 site; New head quarter building selected on the basis of risk analysis including the consideration of both quantitative and qualitative criteria;
- Agreeing the Subject Matters to relevant underlying sources on a sample basis to determine whether all the relevant information has been included in the Subject Matters and prepared in accordance with the Criteria.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

Inherent limitations

Due to the inherent limitations of any internal control structure it is possible that errors or irregularities in the information presented in the Report may occur and not be detected. Our engagement is not designed to detect all weaknesses in the internal controls over the preparation and presentation of the Report, as the engagement has not been performed continuously throughout the period and the procedures performed were undertaken on a test basis.

Restriction of use of our report

Our report should not be regarded as suitable to be used or relied on by any party wishing to acquire rights against us other than PEA, for any purpose or in any other context. Any party other than PEA who obtains access to our report or a copy thereof and chooses to rely on our report (or any part thereof) will do so at its own risk. To the fullest extent permitted by law, we accept or assume no responsibility and deny any liability to any party other than PEA for our work, for this independent limited assurance report, or for the conclusions we have reached.

KPMG PHOOMCHAI AUDIT LTD.

KPMG Phoomchai Audit Ltd.

Bangkok

26 July 2022

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Questionnaire