การเปลี่ยนผ่านโครงข่ายไฟฟ้าและทรัพยากรพลังงาน
: ความท้าทาย โอกาส และมาตรการรองรับ

(Transition of the Power Grid and Energy Resources:
Challenges, Opportunities and Mitigation Measures)

IEEE PES Dinner Talk 2025

วันพุธที่ 12 พฤศจิกายน 2568

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Electricity Generating Authority of Thailand (EGAT)

EGAT Thailand Accelerates Net Zero Target to 2050

Net Zero 2050: Thailand's New Goal

2030	2035	2040	2045	2050	2055	2060	2065	2070
Barbados Bhutan Dominica Maldives Mauritania	Finland	Antigua and Barbuda Austria Iceland	Nepal Sweden Germany Denmark	Australia Brazil EU UK Japan Singapore Malaysia Vietnam	Turkey	Bahrain China Indonesia Kazakhstan Russia Saudi Arabia Ukraine		India Ghana

---- 111 Countries ----

On September 29, 2025, Prime Minister Anutin Charnvirakul advanced Thailand's Net Zero goal from 2065 to 2050. Reducing greenhouse gas emissions is not an option, but a necessity for Thailand's future economic.

Ref: https://www.sdthailand.com/2025/10/thailand-new-target-net-zero-20250/

Quick Big Win in Energy Sector

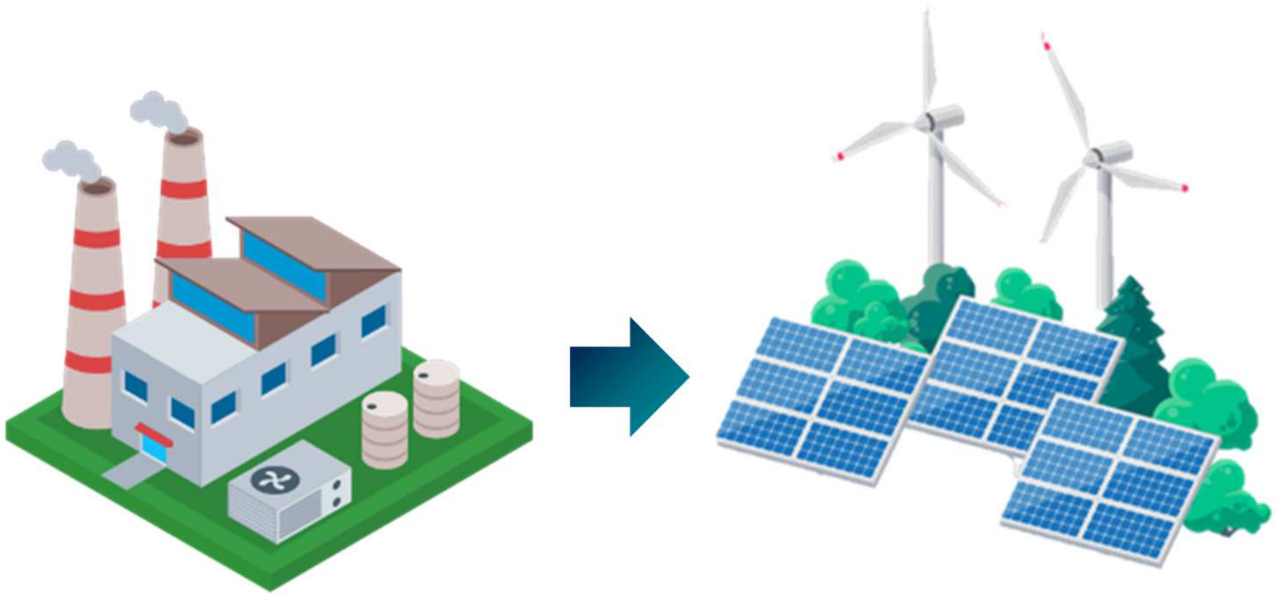
Community Solar Project
- Community solar farms project of 1,500 MW
- Solar water pump for agricultural purpose
- EGAT's Floating solar power plant

Infrastructure Development to Support Industrial Sector
- Direct PPA
- Support power demand of digital industry in EEC

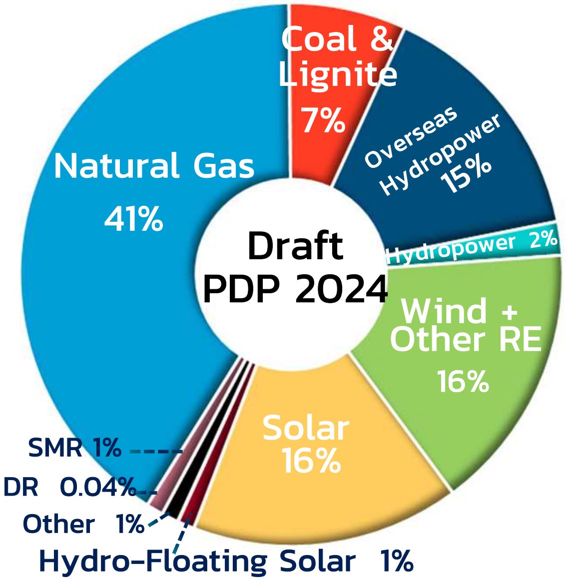
Building Long-Term Sustainability toward Net Zero 2050
- Revising PDP
- Initiating CCS projects

EGAT Trend of Power Generation in Thailand

Energy Transition from Fossil Fuels to Renewables



Draft PDP2024



RE > 50%

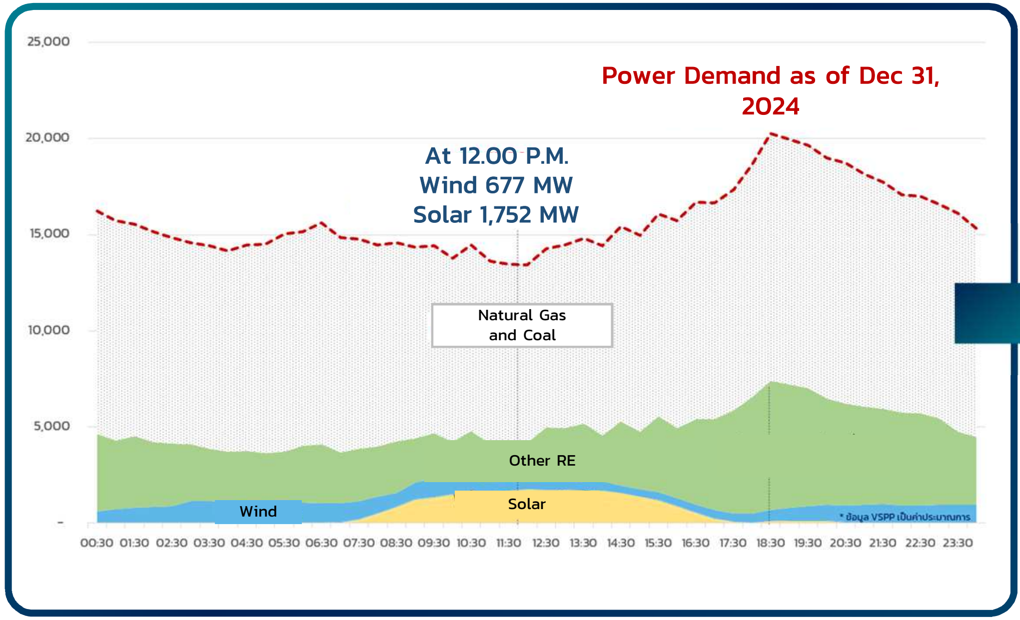
- RE growth
  Fossil fuels decline
- RE accounts for 70–90% of global electricity generation by 2050.
- RE accounts for over 50% of total generation by 2037.

What is going to be in the new PDP?

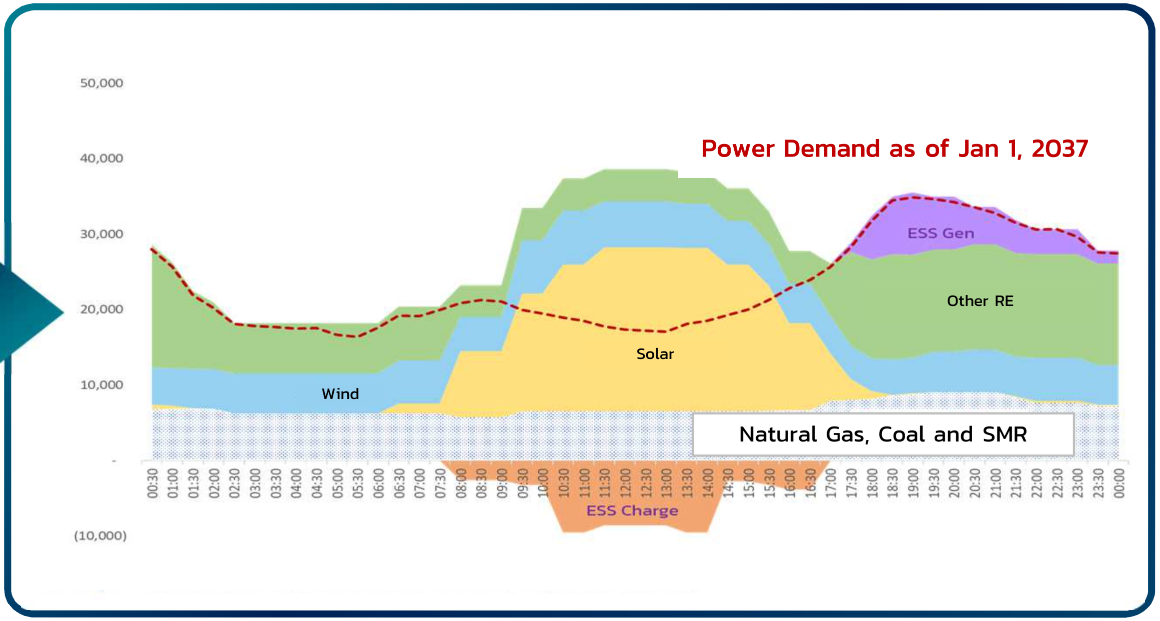
Sources : 1. World Energy outlook 2024, IEA
2. Public hearing on the draft Power Development Plan of Thailand 2024-2037 (Draft PDP2024)

Power System Stability Challenges

Thailand's Current Power System



The Future Power System



EGAT Vision, Mission, and Values

INNOVATE POWER SOLUTIONS FOR A BETTER LIFE

Scope of Vision

Power Security
Operational readiness for imminent changes in the power system due to the evolving context of the nation's energy Industry.

Innovate Solution
Creating energy products/services that meet the needs and expectations of EGAT's key customers and stakeholders

Better Environment
Develop green energy projects to reduce environmental pollution for sustainable quality of life improvement in Thailand

Better Society
Enhance organizational productivity to meet key stakeholders' needs and expectations

GRC Driven Organization
Drive organizational governance with integrated GRC management for sustainable growth and societal acceptance

Mission

Be the country's main organization to secure the power reliability and enhance competitiveness of the nation through innovation for Thai happiness

Organization Values

S – Synergy
รวมพลังประสาน

P – Proactive Approach
รุกงานก้าวไกล

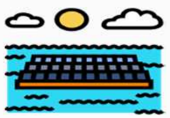
E – Empathy
ใส่ใจสร้างมิตร

E – Entrepreneurship
คิดแบบผู้ประกอบการ

D – Digitalization
ขับเคลื่อนงานด้วยดิจิทัล

EGAT Clean Energy Development Projects

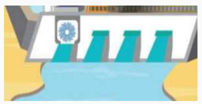
EGAT's Capacity Addition (Draft PDP2024)



Hydro Floating Solar

Combined Cycle Thermal

Pumped Storage



Mini Hydro

Potential on Small Modular Reactor (SMR)

SMR
600 MW

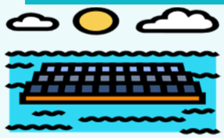
Key Advantage

1. **Security** : 24/7 electricity generation
2. **Economy** : Low production cost
3. **Ecology** : Emission free

EGAT as the SMR Developer

- Proven expertise
- Institutional knowledge on nuclear preparation
- Operation under governmental law and regulation

Potential Renewable energy development projects



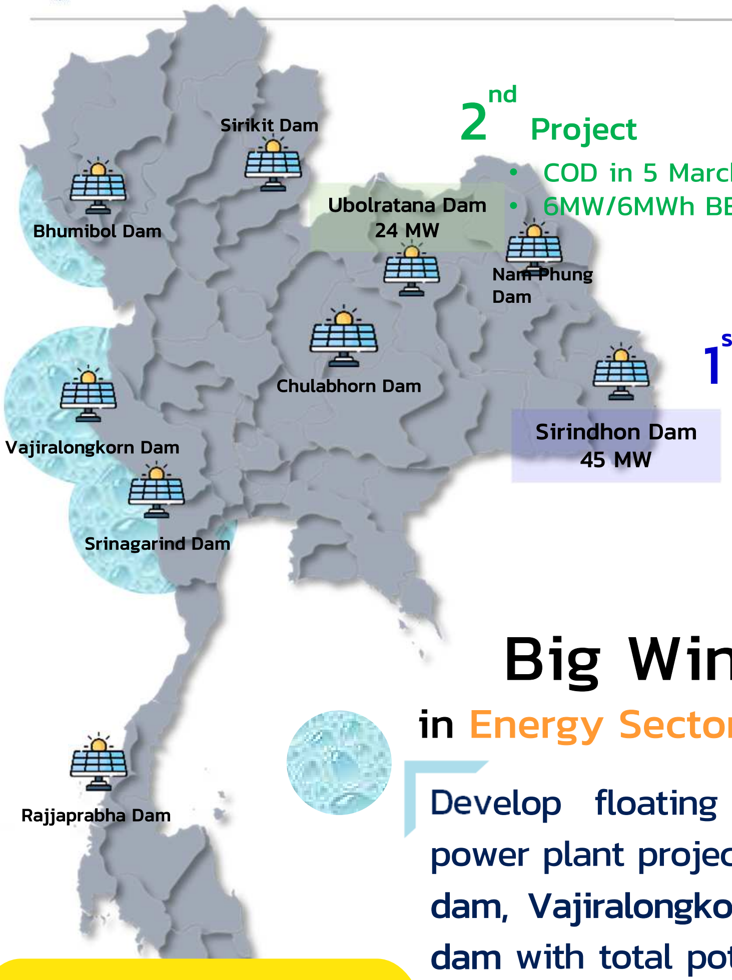
Hydro Floating Solar

Pumped Storage

Grid scale Battery Energy Storage System (BESS)

Solar Farm + Battery

EGAT Floating Solar PV with Hydro Power Plant Project



2nd Project

- COD in 5 March 2024
- 6MW/6MWh BESS

1st Pilot Project

- COD in 31 October 2021
- Using Energy Management System (EMS) and Weather Forecast System
- Connected with existing 115 kV Substation

Big Win

in Energy Sector

Develop floating solar PV with hydro power plant project in 3 areas of Bhumibol dam, Vajiralongkorn dam and Srinagarind dam with total potential capacity of **1,638** MW

2,725 MW

Project implementation during 2021-2030 (According to Draft PDP 2024)

✓ Securing power system with clean energy
ecology friendly and leveraging community quality of life

EGAT T/S Development to Support Energy Transition

Transmission system development support industrial sector in EEC

Support data center power demand in EEC

3 Implementation Phases during 2025-2037 with **total budget of 33,500+ MTHB**

Economic benefits of **580,000 MTHB** with **4,580 jobs employment**

Grid Modernization enhancing system flexibility to support RE

Digital Control Platform

Automated power system control accommodating variation of RE generation

Infrastructure Expansion Planning & Development

Infrastructure planning to develop **long-term strategy on RE management**

New Agreement New Business

Contractual Flexibility driving mitigation mechanism of RE generation variation

Transmission Protection Control Monitoring and Asset Management

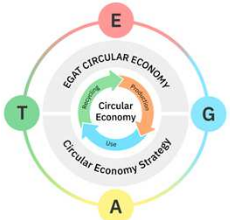
Develop power system protection, control & monitoring and asset management **to ensure system security and reliability**

Support

Develop **Platform** for data analyzing with focus on **cyber security**

EGAT Pathway Toward Sustainability

Credit: lih.com



Circular Economy : maximizing resource efficiency and creating value through sustainable design

Utilization of electricity generation by product i.e. cement production from fly ash and Humic acids

Thailand Voluntary Emission Reduction Program (T-VER)

Sustainability

Environment
- Circular Economy
- Bio-Circular-Green (BCG) Economy

EGAT Operations
- Carbon Footprint
- Green Community

Society and Community
- Increased income
- Higher sales
- Lower costs

Biological Way of Life for Sustainable Development

Utility Green Tariff (UGT)

Green Learning Society

Renewable Energy Certificate (REC)

Energy Management and Optimization

Support Thailand's EV Ecosystem

Energy Efficiency - Label No. 5 (appliances, homes and buildings)

Khok Nong Na Model

CSR: Corporate Social Responsibility
CSV: Creating Shared Value


กฟผ.
นวัตกรรมพลังงานไฟฟ้าเพื่อชีวิตที่ดีกว่า
INNOVATE POWER SOLUTIONS FOR A BETTER LIFE
โรงไฟฟ้าพระนครเหนือ
NORTH BANGKOK
POWER PLANT
SMR
EleX

รอบที่ 2 ความท้าทาย และความหวัง

- สิ่งที่ท่านมองว่ายังเป็นปัญหาอุปสรรคหลักในการเปลี่ยนผ่านโครงข่ายไฟฟ้าและทรัพยากรพลังงานของประเทศไทย และต้องการความร่วมมือ/การสนับสนุนอย่างไร
- สิ่งที่ท่านอยากเห็นเกิดขึ้นกับองค์กร และการพัฒนาประเทศโดยรวม

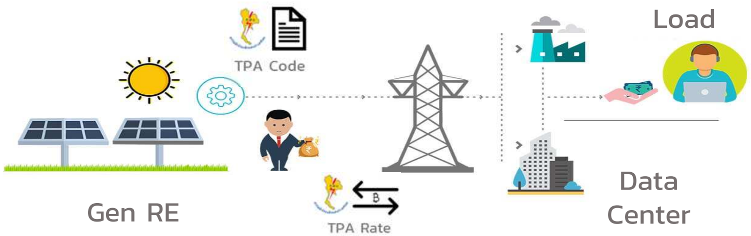
EGAT Challenges & Measures during Energy Transition

Thailand accelerate Net Zero Greenhouse Gases Emission goal from 2065 to 2050.

Quick Big Win in Energy Sector

- Community Solar Project
- Infrastructure Development to Support Industrial Sector
- Building Long-Term Sustainability toward Net Zero 2050

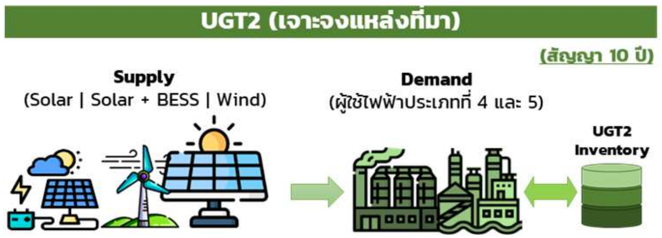
Direct PPA



Direct Contract for buyers and sellers without intermediary or through TPA

3 Utilities will announce TPA Code in December 2025

Utility Green Tariff 2 (UGT2)



- UGT2 tariff rate are under consideration by ERC
- UGT2 is commencing in the 1st Quarter of 2026

Infrastructure Preparation for Industrial Sector

Accommodate an expansion of digital industry with Data Center demand

EGAT Nuclear Power Project Development

Small Modular Reactor (SMR)

Small Modular Reactor (SMR) nuclear power plants with a total capacity of 600 megawatts, scheduled for commercial operation in 2037

(Drafted PDP 2024).

IMPLEMENTATION

- Established a dedicated project preparation committee and specialized working groups.
- Conducting preliminary site studies, preparing human resources, and reviewing relevant legal and regulatory frameworks.
- Collaborating with both domestic and international stakeholders.
- Providing technical data to the Ministry of Energy, preparing nuclear infrastructure to support future deployment, and continuously engaging in public outreach to promote understanding and acceptance of nuclear energy in Thailand.

EGAT Carbon Capture, Utilization, and Storage

EGAT CARBON NEUTRALITY **2050**

2040 **COD of CCUS FULL-SCALE PLANT**

Refer to EGAT's carbon Neutrality Policy

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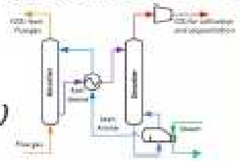
FEASIBILITY STUDY PHASE

CAPTURE

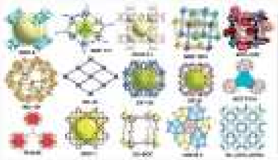
Study on 3 Carbon Capture technologies that are appropriate for EGAT's power plants.

Absorption
(Liquid, Amine-based)



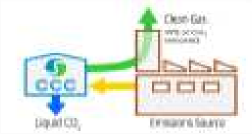
Feasibility study for a post-combustion carbon capture system installed with 600 MW power plant 4 million tons CO2/year

Adsorption
(Solid, MOF)



Cooperate with Thai researchers to study and develop MOF for CO_2 capturing

Cryogenic



Preliminary study on implementing the CCC technology with our existing power plant

CCUS PROJECT START at 2023

UTILIZATION

- In-house research on $CaCO_3$ from Gypsum FGD and Bottom Ash.

STORAGE

- Study a potential **CO_2 onshore underground** storage in **Lampang province,**
- Study the alternative technologies for storage such as **basalt rocks.**

รอบที่ 3 Concluding Remarks

- Key takeaway message from the governor
- สิ่งที่อยากสื่อสารเพิ่มเติม อยากฝาก อยากเชิญชวน

Our *Strong Commitment* on achieving sustainable energy transition

EGAT, as the nation's energy security pillar, is ready to tackle challenges from new innovations and technologies by developing modern and stable power system management approaches that simultaneously address energy security needs.



ENERGY SECURITY

Develop the national power grid to ensure stability and resilience, enabling regional electricity trade and exchange while enhancing the stability of renewable energy integration into the system.

ECONOMY

Collaborate with the government/ stakeholders to manage fuel resources, **optimize electricity production costs, and ensure appropriate investments** in the power system to avoid burdening the public with higher electricity bills.

ENVIRONMENT

Increase the proportion of electricity generation from renewable energy, upgrade power plants and systems with new technologies, and promote participation from all sectors in efficient and environmentally friendly energy usage.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