

# Ignite Thailand

*Invest in Endless Opportunities*

*"Driving Investment  
for Transition to New Industries"*



**Dr. Prasert Sinsukprasert**  
Permanent Secretary of the Ministry of Energy

# 3

## *STEP of Ministry of Energy*

*in Preparing for New Global Investment Challenges*

**1** *Energy plan with clear energy transition goals*

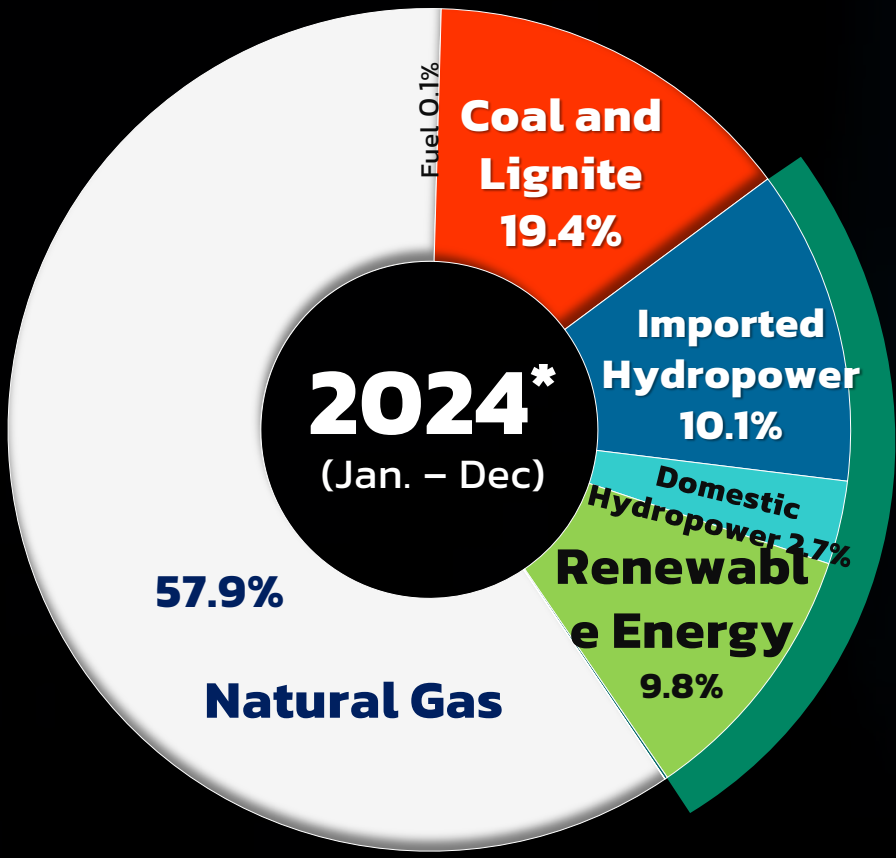
**2** *Energy infrastructure development to support green investment transition*

**3** *Policies to drive clean energy production and consumption in the country*

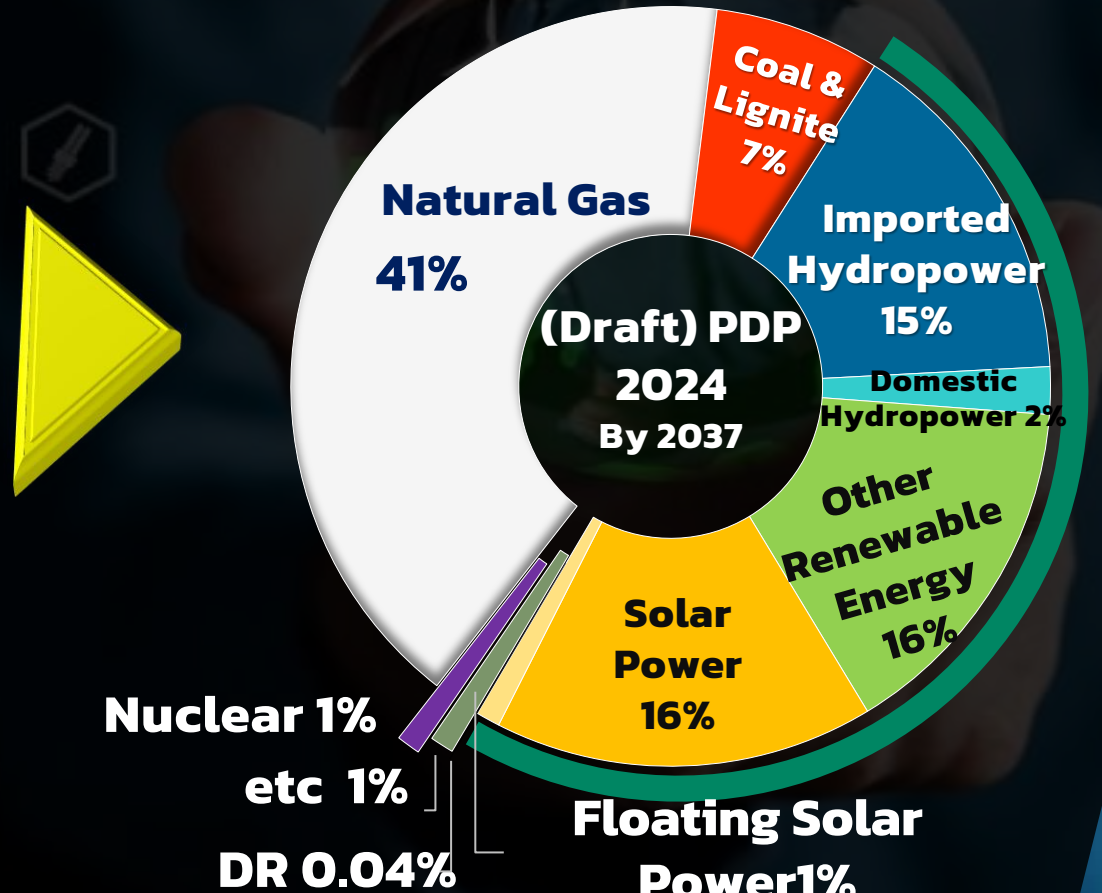
# Energy Plans with Clear Energy Transition Goals According to the new PDP draft

Setting a target for electricity production from clean energy to **exceed 50%**

**Clean Energy 22.6%**  
Current



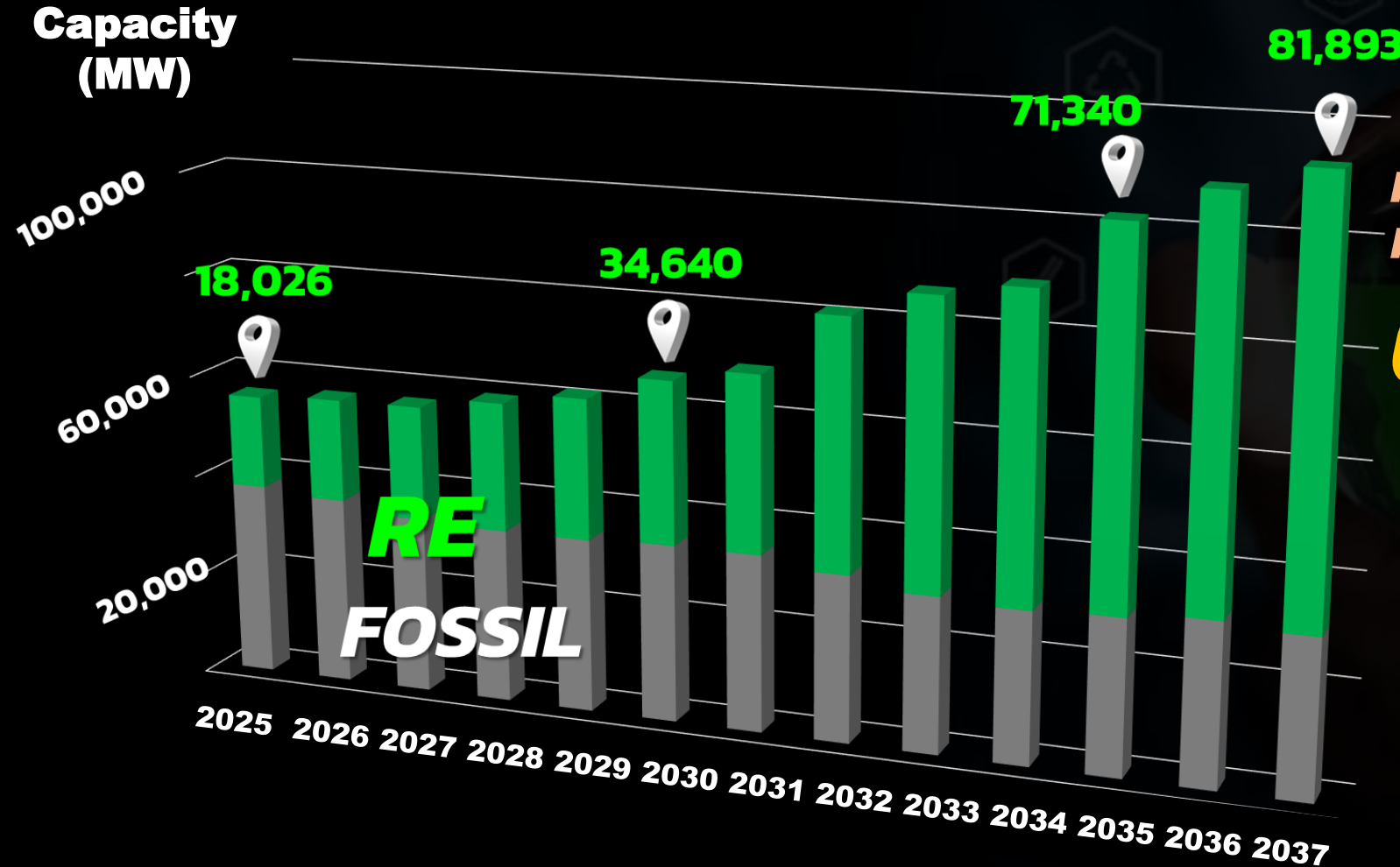
**Clean Energy 51%**  
By 2037



Source: Draft PDP from public hearings as of June 2024

# 1 Energy Plans With Clear Energy Transition Goals

## Electricity Production Capacity of the Three Electricity Authorities



According to the new PDP, the target for electricity production from clean energy" by 2037

Increased from the Current Level by More Than"

**63,867 MW\***

**Creating Significant Opportunities for Investment in New Forms of Energy Industries**

# 2 Developing Energy Infrastructure to Support Green Investment Transition

## Adopt AI Technology to Elevate Thailand's Energy System for New Industries

### Flexible Power Plant

Dispatch effectively and rapidly to support Fluctuation of VRE generation.

### Flexible Grid

Smart grid integrate with communication system to monitoring the grid data and install STATCOM for enhance power system stability.

### Grid-Scale Energy Storage

Install Pump Storage and Battery Energy Storage System as the Grid – Scale Energy Storage to maintain grid's stability and resilience contributing to VRE penetration.

### Virtual Power Plant (VPP)

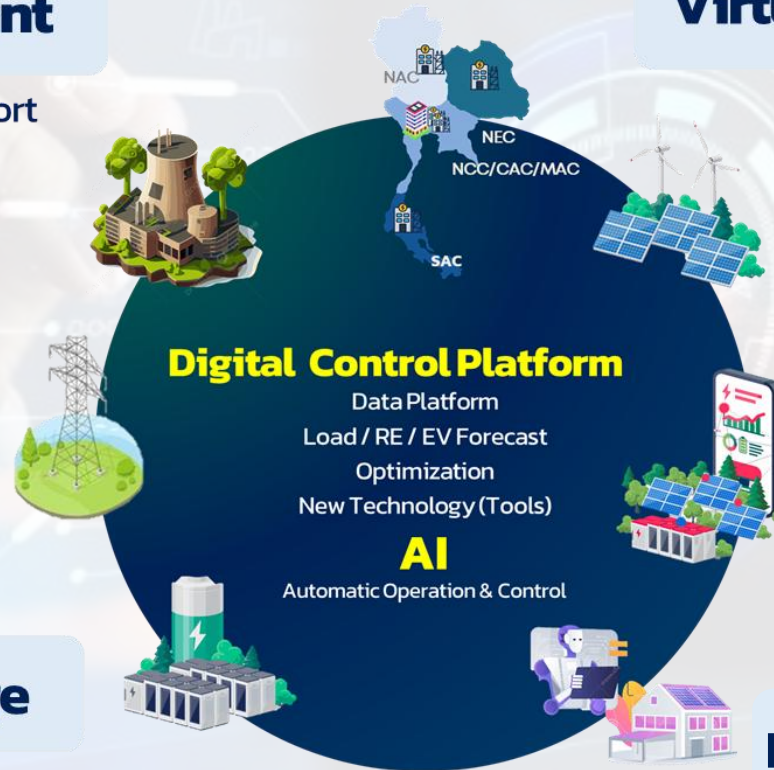
Refer to platform that Integrated all multi type of renewable power plant to dispatch according to the demand, utilizing the strengths of each type to ensure continuous operation.

### RE Energy Forecast Center

Organize 5 RE Forecast Center at RCC (REFC) countrywide.

### Demand Response Control Center

The pilot project involves a 50 MW load reduction With MEA and PEA serving as LAs.



# 2 Developing Energy Infrastructure to Support Green Investment Transition

## Technology in Infrastructure for Grid modernization

### Smart Substation

Substations become more flexible and smarter, accommodating RE fluctuations and the future introduction of EVs, enabling more efficient maintenance planning

### Distribution System Automation

Automated distribution system control to efficiently support large numbers of DERs (Distributed Energy Resources)

### SCADA/EMS/DMS

Used for monitoring status and analyzing electricity distribution situations, helping to efficiently manage and control voltage in electricity distribution with quality and safety

### FACTS Devices

(Flexible AC Transmission System : FACTS)  
Increases capability in controlling and delivering electrical power

### AMI

(Advanced Metering Infrastructure)

Is an essential Enabling Technology for accessing DERs and implementing DE

### VSP Data Integration

Enables visibility, forecasting, and commanding of VSP, as well as appropriately commanding other system components, and extracting data for beneficial use in the system

### PMU

(Phasor Measurement Unit)

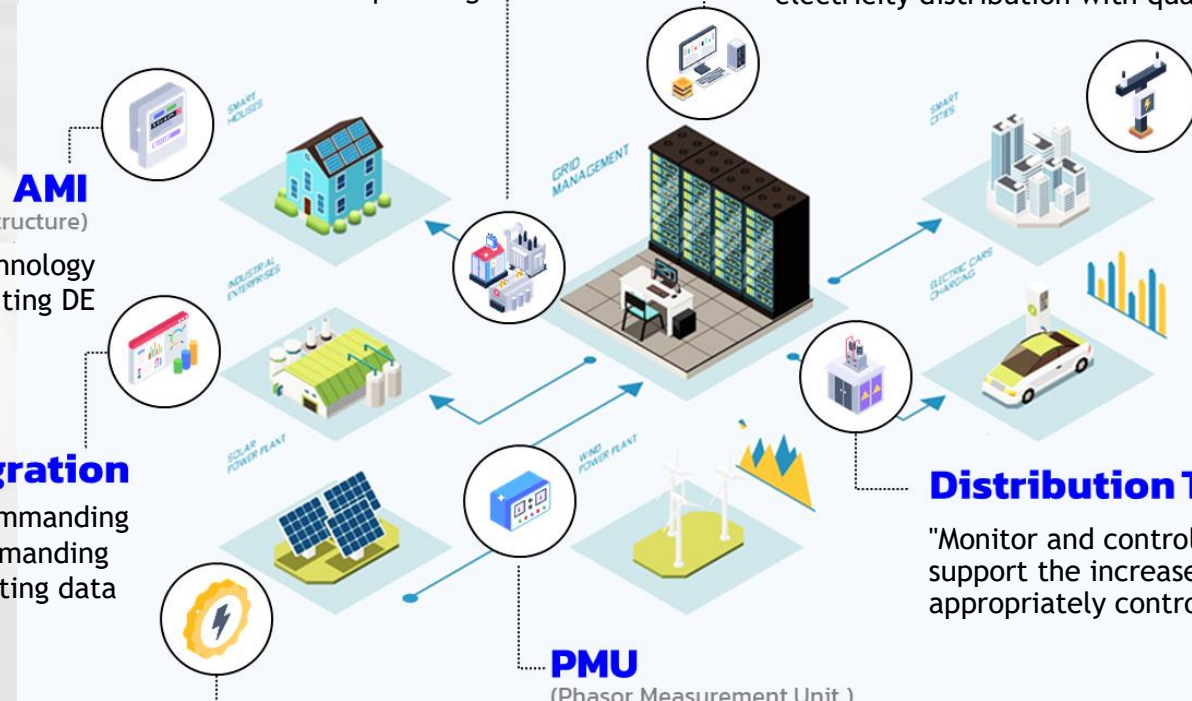
"Increases quick, detailed, and accurate visibility in the electrical system, enabling rapid problem-solving commands"

### RE Integration

"Enables the RE system to support very high proportions by allocating appropriate, sufficient, and affordable Flexibility Resources"

### Distribution Transformer Monitoring

"Monitor and control individual distribution transformers to support the increase/decrease of RE proportions and appropriately control EV charging"



# 2 Developing Energy Infrastructure to Support Green Investment Transition

## ICT Technology for Grid Modernization

### 5G

A new wireless communication network that has been improved and developed in terms of speed for data transmission between **"human-to-human"**, **"human-to-device"** and **"device-to-device"**

Example: Using 5G in electrical grid operations, such as distribution feeder automation systems, real-time electrical system control, collection of electricity usage data from users, distribution of power sources, etc.

### Blockchain

Opportunities for using Blockchain in the energy industry

For example, the use of platforms for electricity billing and net energy metering, peer-to-peer (P2P) trading platforms, trading of Renewable Energy Certificates (RECs), international energy trading, electric vehicles and Vehicle-to-Grid (V2G), and customer management, etc.

### Big Data & AI

It is a technology for collecting and analyzing large data sets, which involves the application of Big Data & AI in the energy sector.

For example, improving operational efficiency, analyzing home energy usage, RE (Renewable Energy) Prediction, Customer Analytics, etc.



# 2 Developing Energy Infrastructure to Support Green Investment Transition

## Policy Direction for **GRID INFRASTRUCTURE**

Accelerating the **"Roll Out Smart Meter"** to Cover all Electricity Consumer Groups



### Current Installation Completed

- Large electricity users **10.8%**
- Small electricity users **0.5%**

### Installation completion planned by 2027

- Large electricity users **100%**
- Small electricity users **21.3%**



### Current Installation Completed

- Large electricity users **92.1%**
- Small electricity users **0.6%**

### Installation completion planned By 2027

- Large electricity users **100%**
- Small electricity users **0.6%\***

*PEA plans to complete installations for more than 5.3 million small electricity users after 2027, equivalent to 25%*



# 2 Developing Energy Infrastructure to Support Green Investment Transition



Accelerating the development of **“Digitalize/Smart Substation”** to support Energy Transition



Currently **Completed 100%**



To be completed 100% by **2027**



To be completed 100% by **2031**

# 2 Developing Energy Infrastructure to Support Green Investment Transition

## Infrastructure Investment for **Electric Vehicle**

Investment Target for Electric Vehicle Charging Station Development & Promoting Batteries for EV Production



Fast Charge  
12,000 Dispensers



Battery Swapping  
1,450 Stations

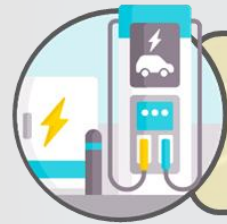
Number of Chargers in Urban Areas: 1,085 Units, Battery Swapping Stations: 960 Stations

Number of Chargers in Urban Areas: 1,189 Units, Battery Swapping Stations: 1,797 Stations

Number of Chargers in Urban Areas: 1,364 Units, Battery Swapping Stations: 1,780 Stations

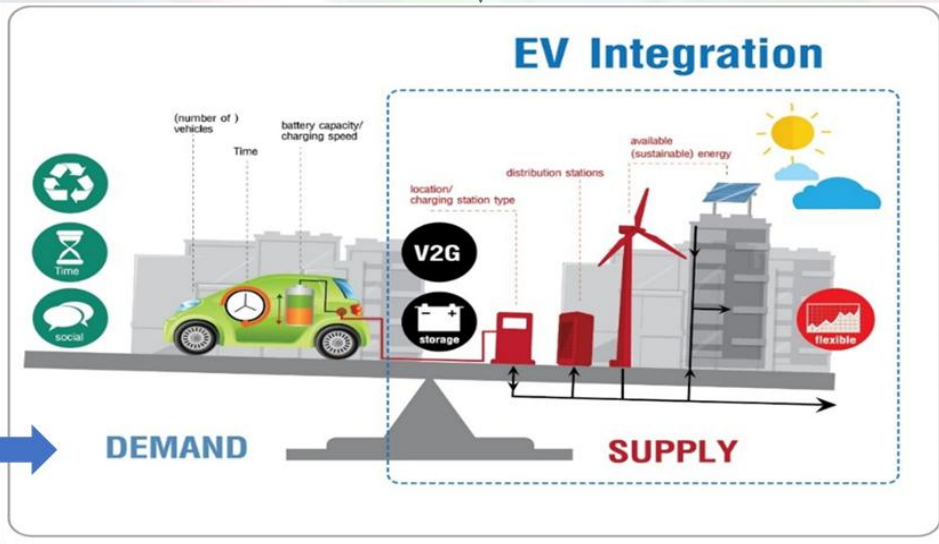
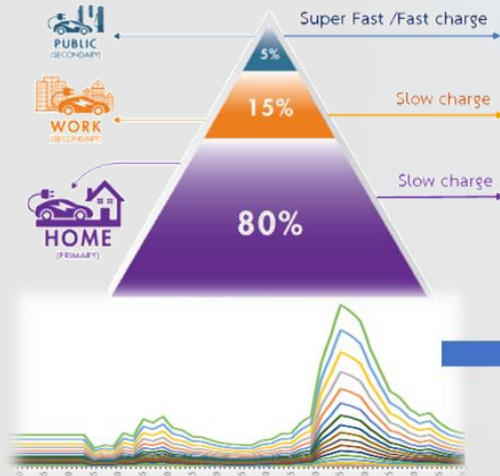
Number of Chargers in Urban Areas: 3,670 Units, Battery Swapping Stations: 3,131 Stations

จำนวนเครื่องอัดประจุในพื้นที่เมือง 919 เครื่อง สถานีสลับแบตเตอรี่ 623 สถานี



### Public Charging Station Investment

sufficient and not burdensome for electricity users



# 3 Policies to Drive Clean Energy Production and Consumption in Thailand

## Direct PPA with Electricity Transmission through Utility Grid Networks

The Ministry of Energy is currently studying and considering guidelines for Direct Power Purchase Agreements (Direct PPA) with two models as follows:

**UGT: Utility Green Tariff**  
 One-stop service and an alternative option for consumers who need to use green electricity or certified renewable energy electricity. The utility functions as an intermediary in procurement and aggregation of green electricity for consumers through the utility grid network under the oversight of the Electricity Generating Authority of Thailand (EGAT).



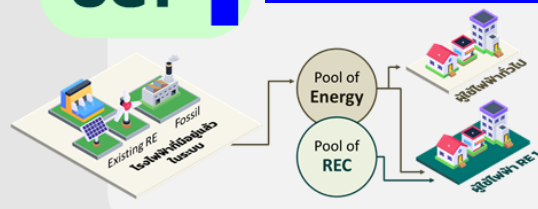
**UGT = Electricity from renewable energy sources that do not emit CO<sub>2</sub>**

Such as solar, wind, hydro, and biomass power.

This means electricity consumers don't need to directly enter into electricity purchase agreements with power plants.

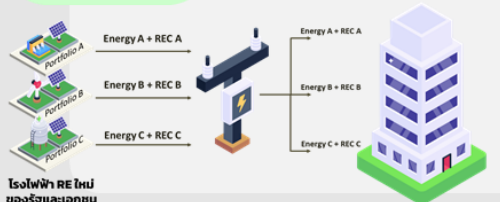


### UGT 1 Existing RE Power Plants (no specific location)



**Rate UGT1 = Normal electricity rate + REC certification premium**  
**Covering REC certification costs**

### UGT 2 New RE Power Plants (specific location)



**Rate UGT2 = Green electricity rate from selected sources + REC certification + Grid service fee**

**UGT service rates for both categories reflect the actual cost of providing green electricity service:**

- Standards are internationally recognized
- Investment allocation system covers public utility costs
- Fair to all consumer groups

**Expected implementation timeline:**

- UGT1 rates in 2024
- UGT2 rates in 2025

# 3

## Policies to Drive Clean Energy Production and Consumption in Thailand

### Direct PPA with Electricity Transmission through Utility Grid Networks

The Ministry of Energy is currently studying and considering approaches for Direct PPA with 2 models as follows:

#### 2 TPA

##### TPA: Direct PPA through Third Party Access

Opening access for private entities to use the electricity grid system (Third Party Access: TPA) to transmit electricity to their own customers (Direct PPA), which will require paying TPA service fees to the grid owners according to established regulations.



The Ministry of Energy, through the Energy Regulatory Commission, is currently studying criteria and guidelines for establishing TPA regulations, including supervision guidelines and service rates that cover various costs such as:

- Wheeling charges
- Connection charges
- Ancillary services charges
- Imbalance charges
- Policy expenses

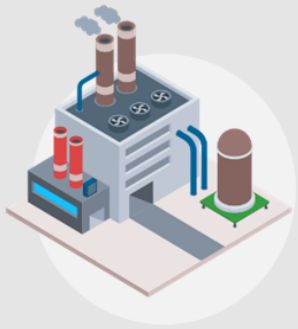


Pilot Project for Electricity Trading from Renewable Energy in Direct PPA Format Through TPA service for 2,000 MW in the Data Center business sector, as approved by the National Energy Policy Committee on June 25, 2024.



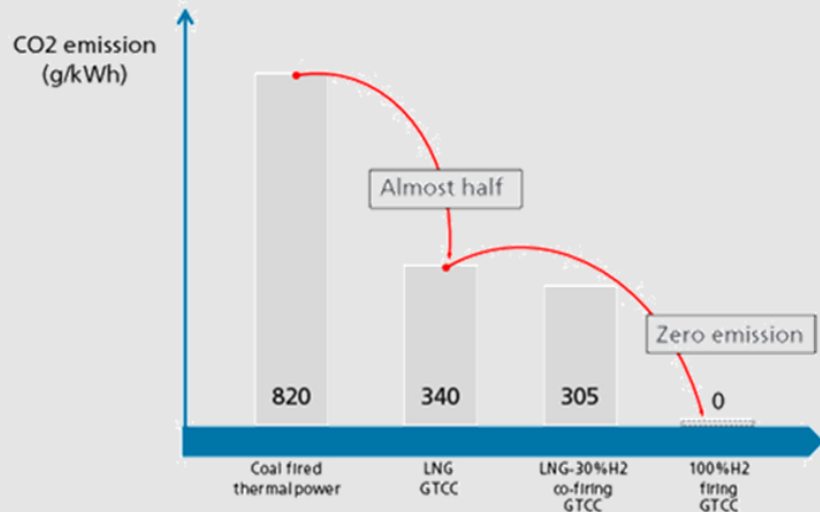
# 3 Policies to Drive Clean Energy Production and Consumption in Thailand

Policy to promote electricity production from clean energy/alternative technologies to help reduce CO<sub>2</sub>

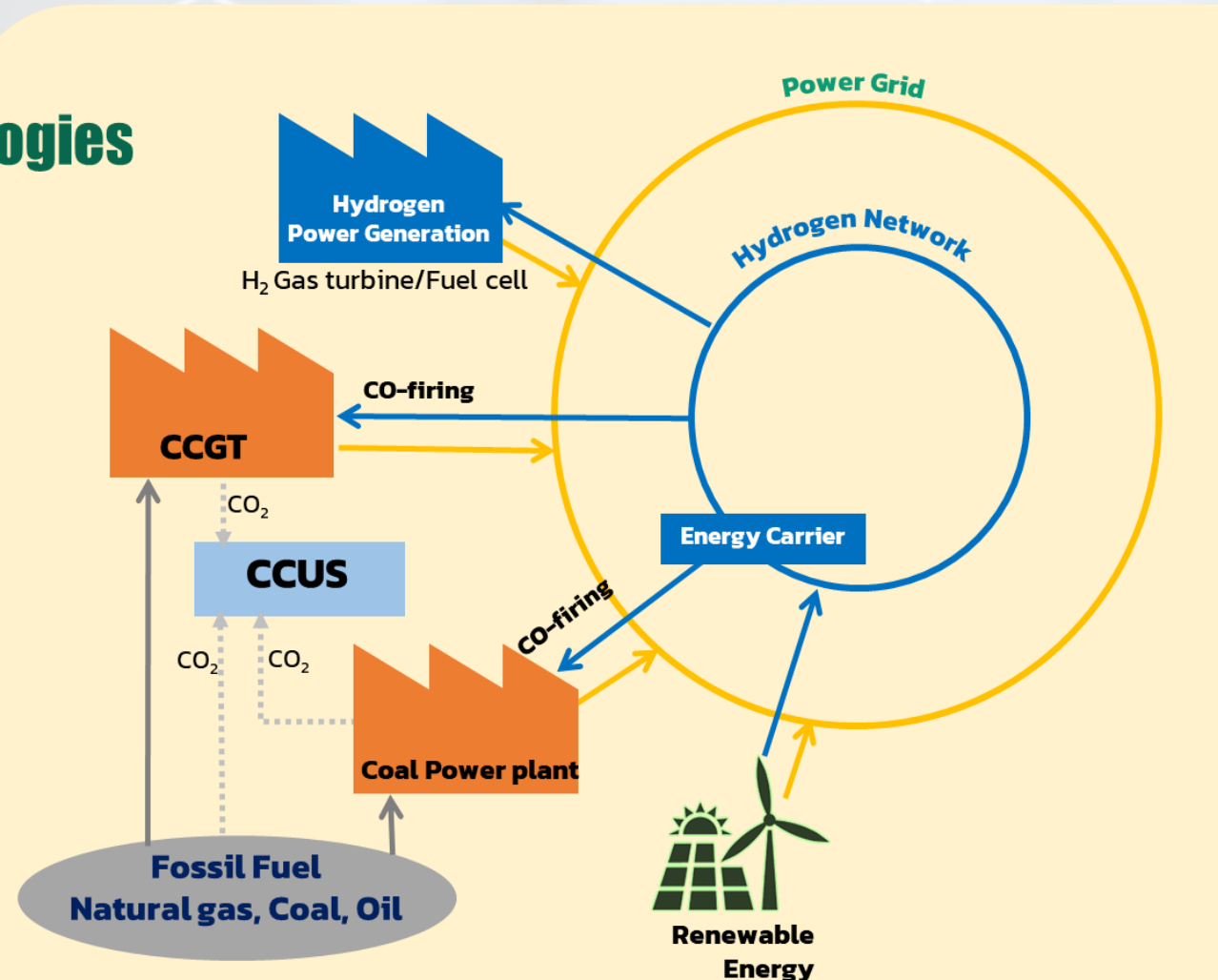


## Fossil Fuel with low carbon technologies

- ★ Co-firing NG & H<sub>2</sub>
- ★ Co-firing Coal & NH<sub>3</sub>
- ★ CCUS



ที่มา : power.mhi.com



# 3 Policies to Drive Clean Energy Production and Consumption in Thailand

Policy to promote electricity production from clean energy/alternative technologies to help reduce CO<sub>2</sub>

## Clean & Green Energy



- ★ Hydro Power Plant (Imported)
- ★ Renewable Power Plant
  - ▶ Solar  
(Solar Farm/Solar Rooftop/Solar Floating)
  - ▶ Other RE  
(Wind/Small Hydro/Biomass/Biogas/Waste)
- ★ RE+BESS
- ★ SMR / μ-SMR / Advanced SMR
- ★ H2 Gas Turbine
- ★ Fuel Cell

### NEXT DECADE



Modern renewable energy



Hybrid Solar Floating



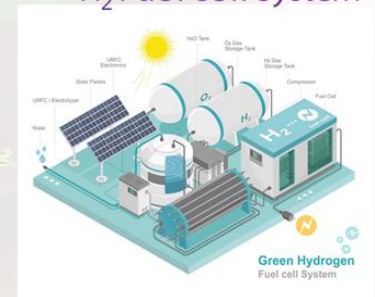
RE+BESS

### FUTURE

SMRs Estimated Timeline of Deployment



H<sub>2</sub> Fuel cell System



H<sub>2</sub> Gas Turbine

# 3 Policies to Drive Clean Energy Production and Consumption in Thailand

## The application of RECs to promote RE

### Increase efficiency in RE power generation development



- Increase the value of electricity produced from RE
- Develop RE power generation projects that don't necessarily depend on government support, have greater independence, and can expand beyond the framework set by the government

### Increase efficiency in cost management of RE power generation



- Separate expenses for supporting RE power generation (partially) from electricity costs and directly pass them on to target groups (Matching)
- Can manage to distribute the cost burden appropriately to target groups through mandatory mechanisms

### Target for applying RECs

### Enhance economic potential from opportunities to access electricity produced from RE

- Attract and respond to the needs of entrepreneurs who want to conduct sustainable business practices (ESG) in Thailand
- Strengthen the competitiveness of Thai entrepreneurs in the international market, which has a tendency to change according to the Sustainable Development Goals (SDGs)



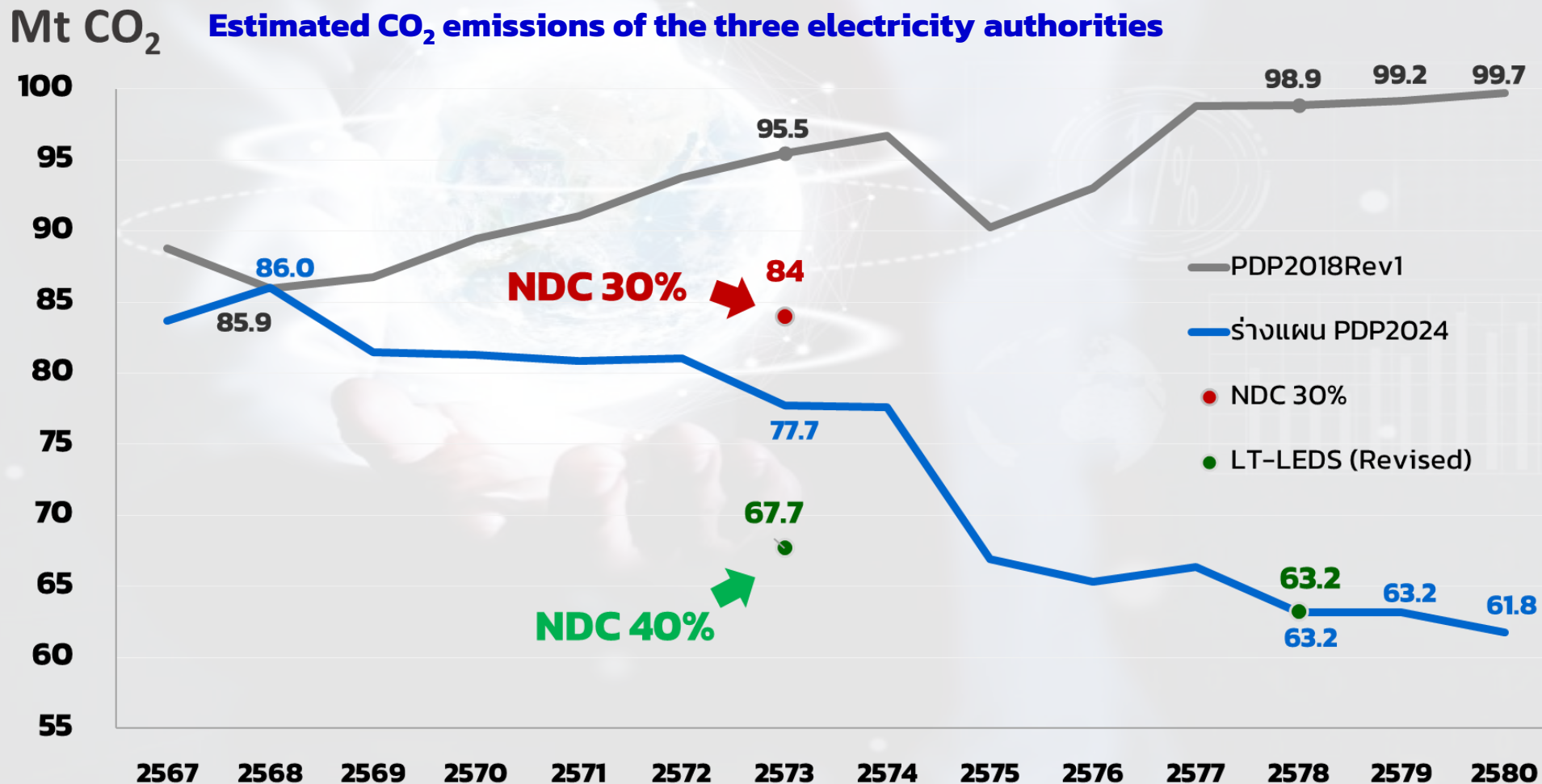
### Elevate capabilities in achieving AEDP targets and Carbon Neutrality

- Increase opportunities to reduce greenhouse gas emissions from electricity generation with RE
- Elevate clarity and transparency of RE electricity production data to be internationally accepted
- Enhance potential in data management and progress tracking by preventing double counting

# 3

## Steps of the Ministry of Energy in preparing to meet new challenges in the global investment world

### Moving towards important global goals achieving carbon neutrality **by 2050**



Source: Draft PDP plan for public hearing as of June 2024

\*Considering CO<sub>2</sub> with 5% hydrogen blend



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# Thank you