

# MARKET SPOTLIGHT: THAILAND



**Kitiya Tavorn**  
Decarbonization  
Partnership Manager  
Innopower Company Limited



**Somboon Lertsuwannaroj**  
CEO  
Altervim

Tuesday, 29 April 2:45-3:30 PM



**Renewable Energy  
Markets™ Asia 2025**

Reimagine  
Your Power



## Thailand's FDI Magnet Strategy Through RE Policies

April 2025

**Somboon Lertsuwannaroj**  
*CEO, Altermim*

# Leading Clean Energy and Energy Transition Partner in APAC



## Altermim at a Glance



ALTERNVIM

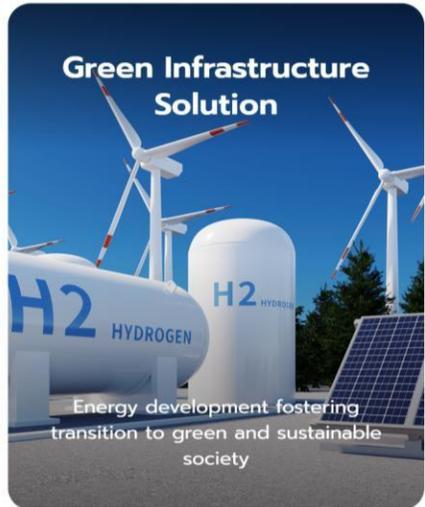
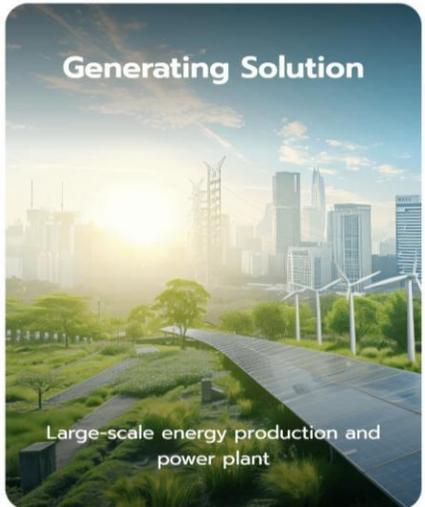
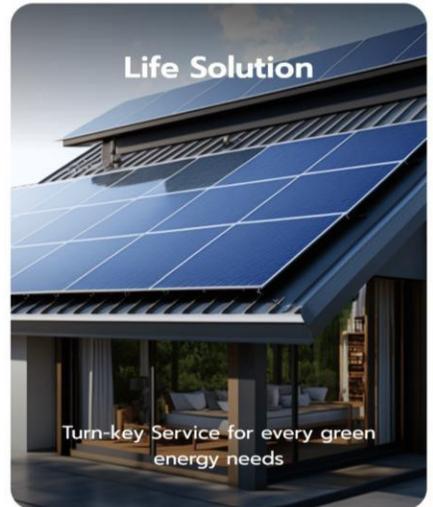
Altermim is a flagship renewable energy company under CP GROUP



**Powering Clean and Affordable Energy to Next Generations**



## OUR BUSINESS



## KEY INVESTMENT PORTFOLIO

Our team has extensive investment and development experience in new energy technology across Thailand and SEA including, solar, battery, energy efficiency, and digital energy solutions.



# Innovatively powering the business with our clean energy project and infrastructure

## Key Initiatives and Flagship Projects

### DC Super Fast Chargers



### Solutions for Datacenter



### Solar Home



### Green Micro Grid Solar + ESS + Biogas



### Large Scale Solar Farm



### Digital Energy



### > 3,000 Solar Rooftop, Floating, Carpark



# Today's Agenda



- 1) Thailand Power Development Plan**
- 2) Investment Magnet through Direct PPA Policy**



# Today's Agenda

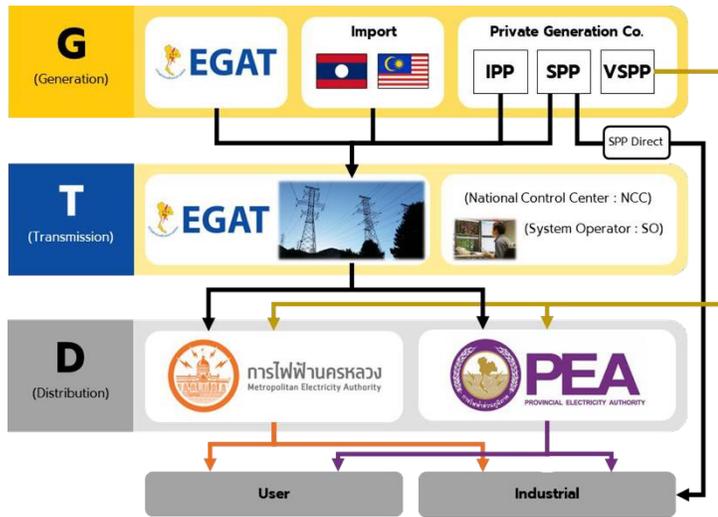
**1) Thailand Power Development Plan**

2) Investment Magnet through Direct PPA Policy

# Thailand's Electricity Market is fully regulated through with opportunities for private participation through FiT and behind-the-meter scheme

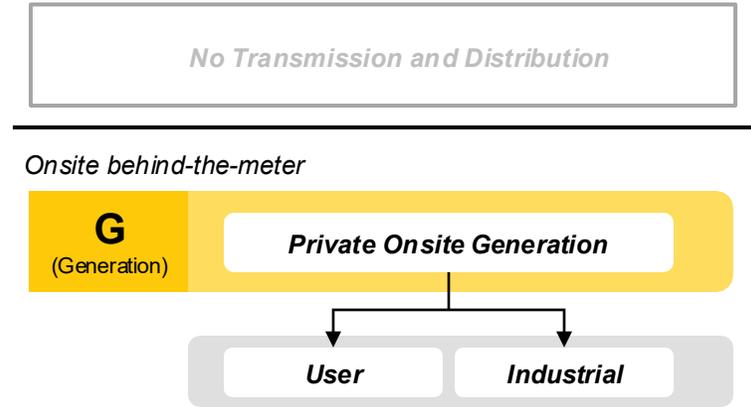
## Current Thailand's Electricity Business Models

### Enhanced Single Buyer Model



Participation opportunities for private sector through Feed-in-Tariff scheme

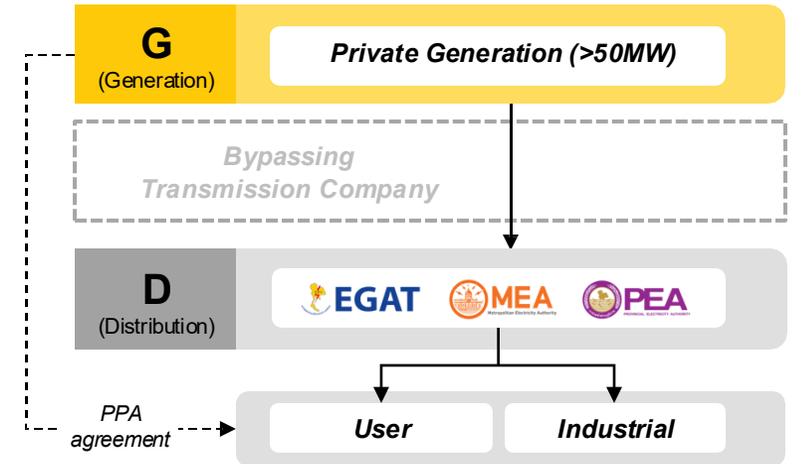
### Onsite Behind-the-Meter Model



Onsite RE generation through private connected distribution lines

### Direct PPA Model (pending)

More details in the next section



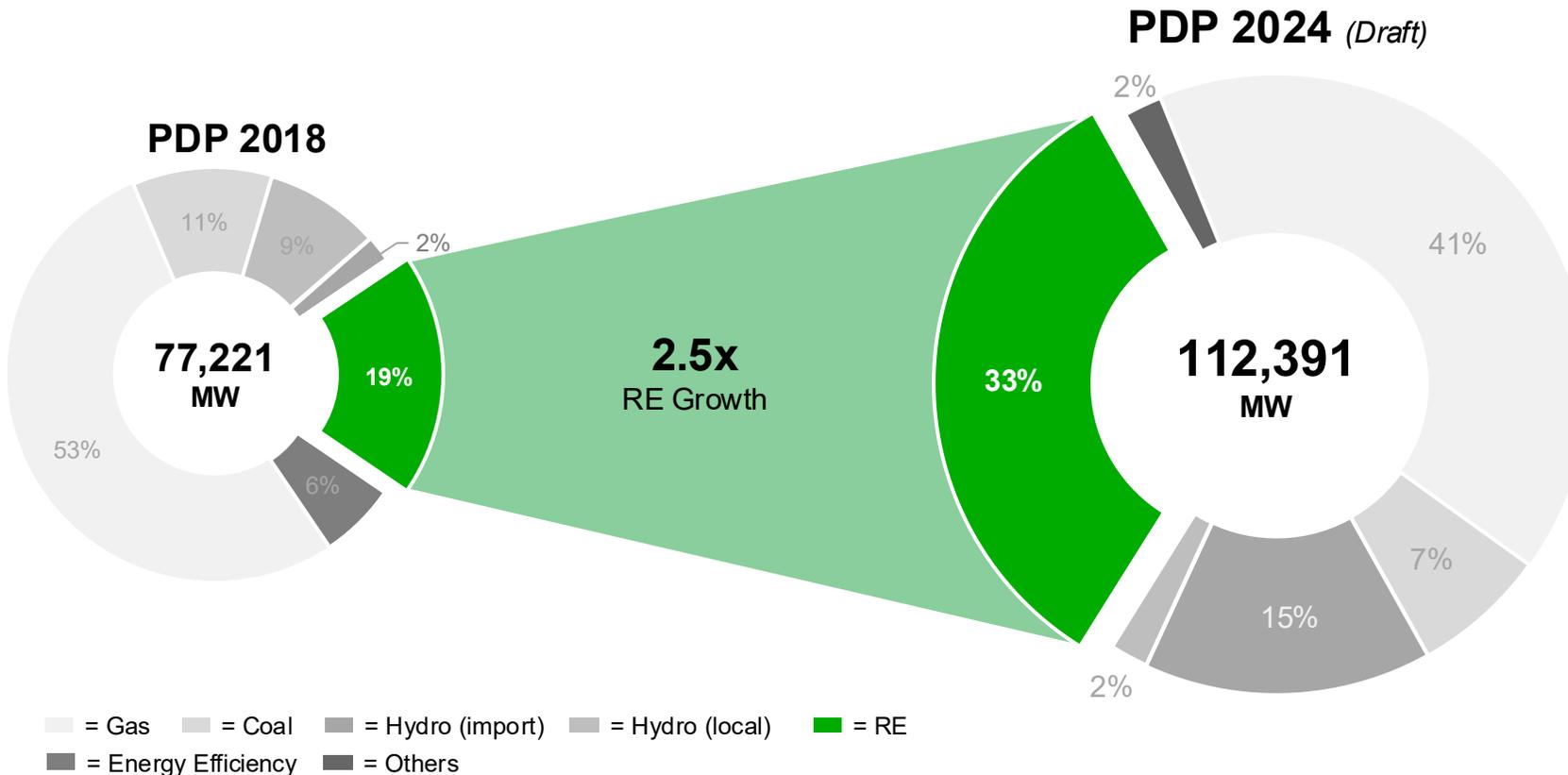
Virtual access to RE supplies through national distribution lines



# The new PDP 2024 is expected to drive significant RE adoptions with new technologies and business models



## PDP Installed Capacity Target by Energy Sources % MW, 2037



### Policy Drivers

- Feed-in-Tariff
- Utility Green Tariff
- Direct PPA
- Prosumer Solar Rooftop

### New Technologies

- BESS >26,000 MWh
- Nuclear SMR 600 MW
- Hydrogen

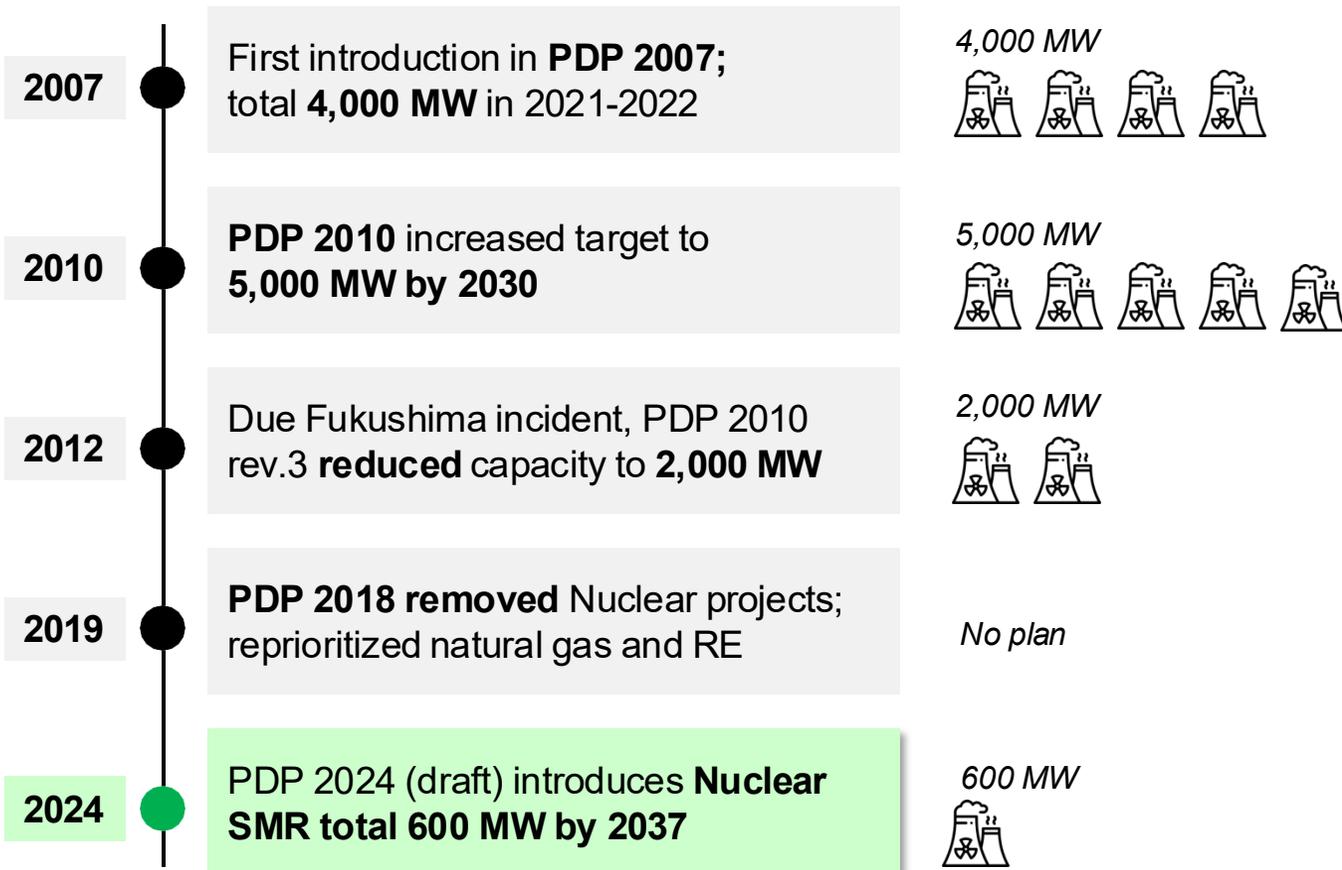
# Potential significant RE opportunities available for Feed-in-Tarriff; Over 27+ GW Solar PV and 26+ GWh BESS

Target installed RE capacity by Types (Draft PDP 2024)

MW		2024-2030	2031	2032	2033	2034	2035	2036	2037	Total
<b>Solar</b>		3,456	1,258	6,767	1,840	1,480	8,387	1,475	2,430	27,093
<b>BESS (MWh)</b>				5,770	11,960		8,280			26,010
<b>Wind</b>			810	800	750	750	750	750	735	5,345
<b>Biomass / Biogas</b>		249	316	280	280	301	301	231	24	1,982
<b>Waste-to-Energy</b>			212				100			312

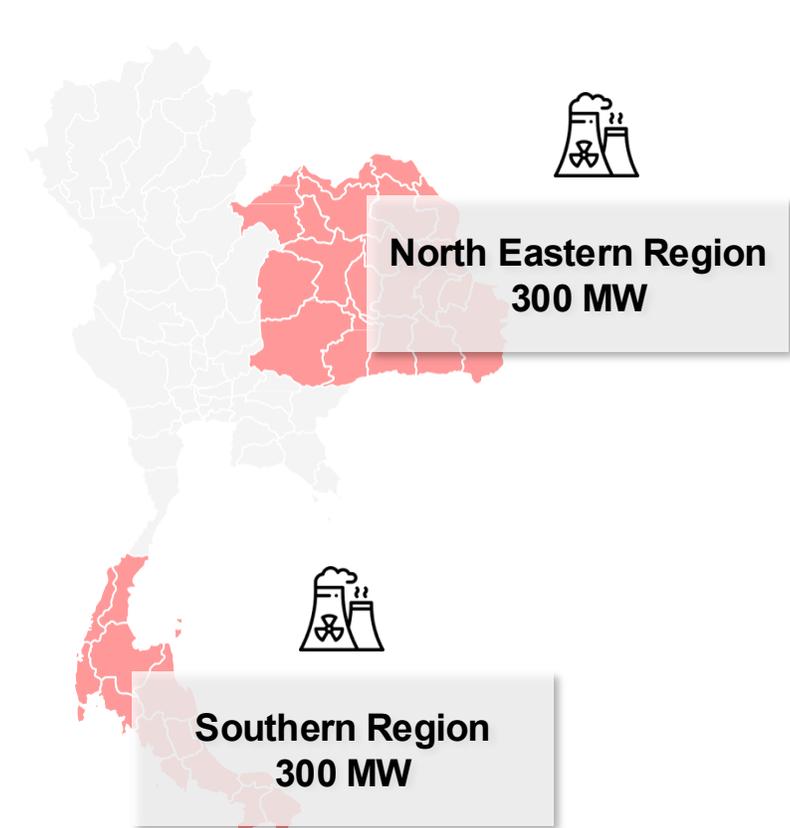
# In addition to FiT scheme, PDP 2024 is also re-introducing Nuclear SMR technology as part installed capacity in 2037

## History of Thailand's Nuclear policy development



## Total 600 MW Nuclear SMR projects across 2 regions in Thailand

(based on Draft PDP2024)



# Today's Agenda

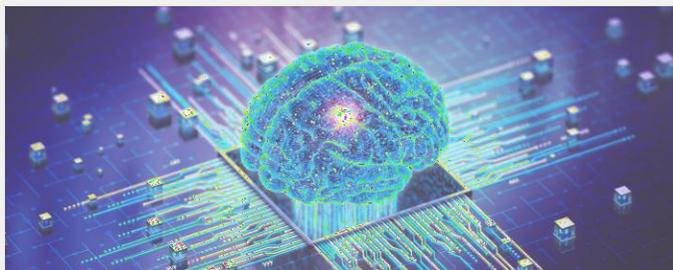


1) Thailand Power Development Plan

**2) Investment Magnet through Direct PPA Policy**

# 3 New S-curve industries will accelerate Thailand's economic growth; supported by 3 key national infrastructure

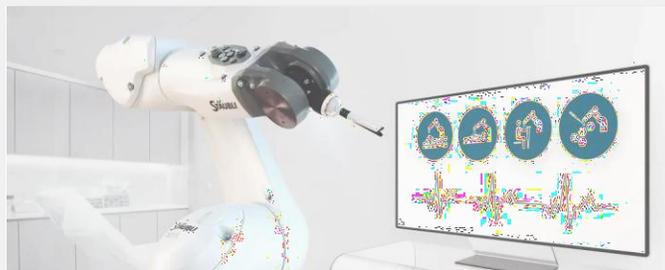
## Digital Economy Hub



**“Green-hungry” players**  
~12,000 – 31,000 MW<sup>1</sup>



## Innovation & Medical Hub



**EV Hub by 2030**

~14,000 MW  
440,000 units

**Stem Cells**

~4,800 Mn THB<sup>2</sup>  
2030 Market Size

## Tourism & Entertainment Hub



**Entertainment Complex**

>500,000 Mn THB  
Investment

## Supporting Infrastructure

### High-speed Train



>120,000 Mn THB  
>600 MW

### Last-mile Fleet



~12,000 Mn THB  
Investment

### ASEAN Power Grid

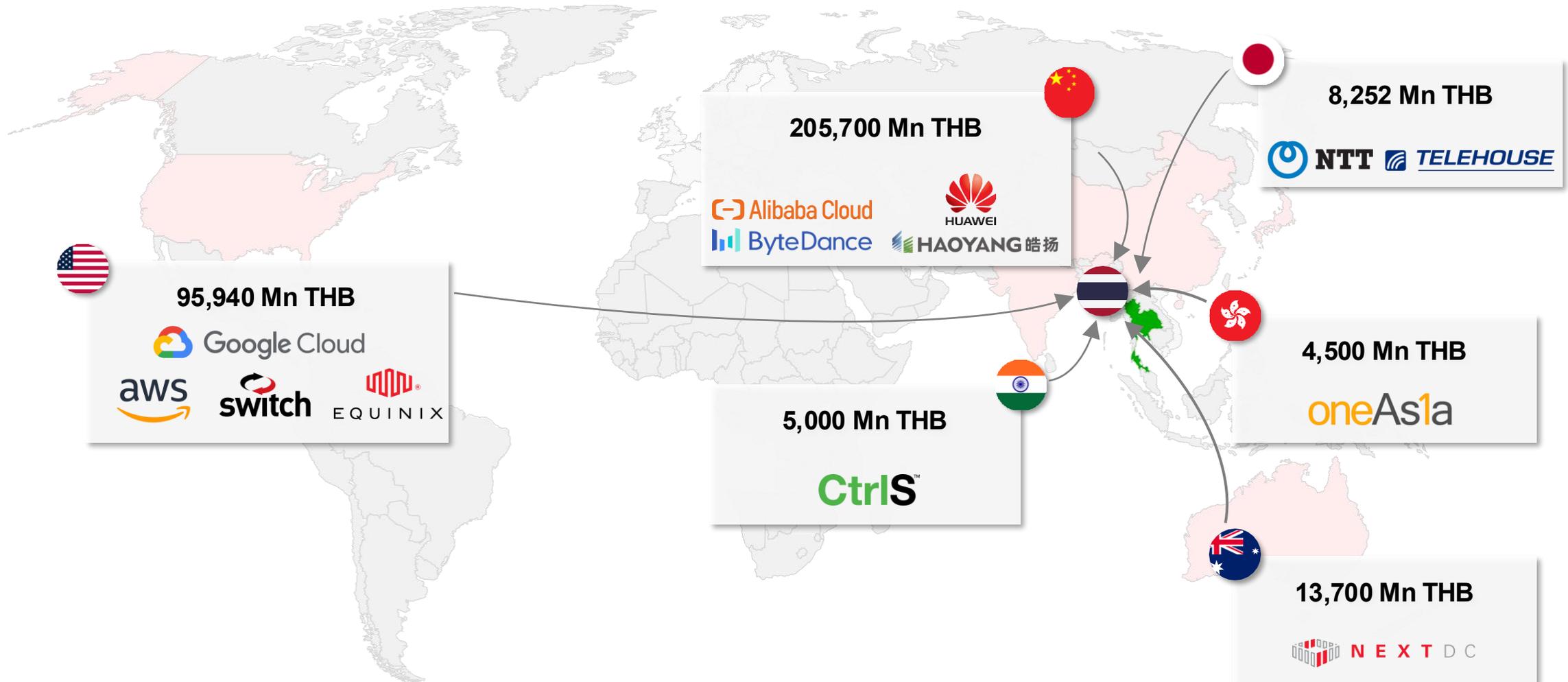


>10,000 MW  
Imported electricity

1. Estimate installed capacity based on investments  
2. Based on global market size with 11% CAGR 2024 - 2030

# Since 2024, Thailand has already attracted over >330k Mn THB FDI from Data Center and Cloud Services companies globally

## Data Center Investments in Thailand from Overseas Companies



# Overview of Thailand Direct PPA Scheme

Thailand Government is introducing a Direct PPA scheme as an **incentive policy to attract Foreign Direct Investment (FDI)**;

Total 2,000 MW pilot quota for Data Center businesses



*Offsite Large-scale RE generations*

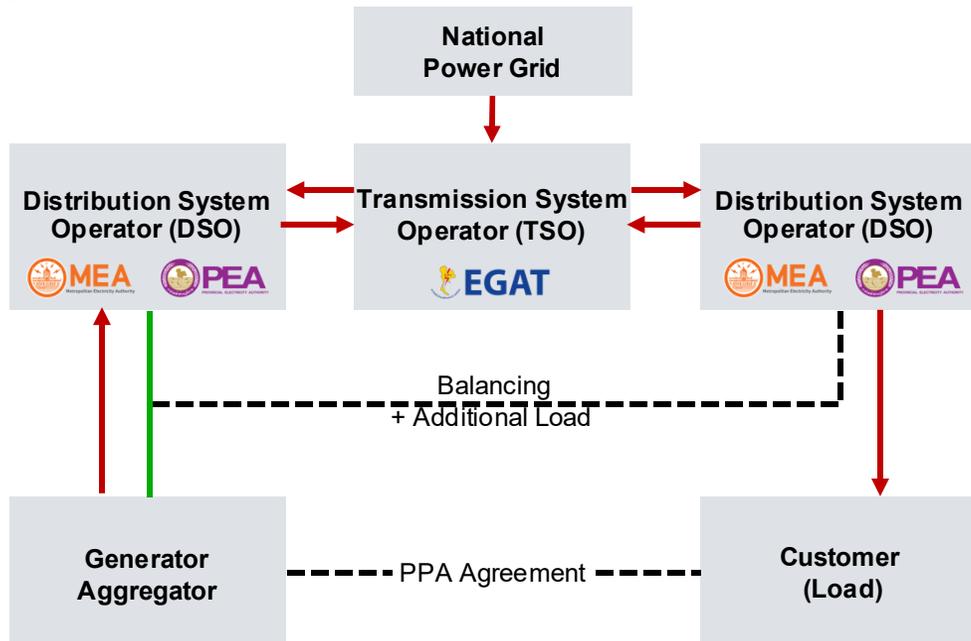
*National Transmission and Distribution lines*

*Virtual access to RE without onsite installations*

# Thailand Government is exploring 2 potential business models for the pilot Direct PPA scheme

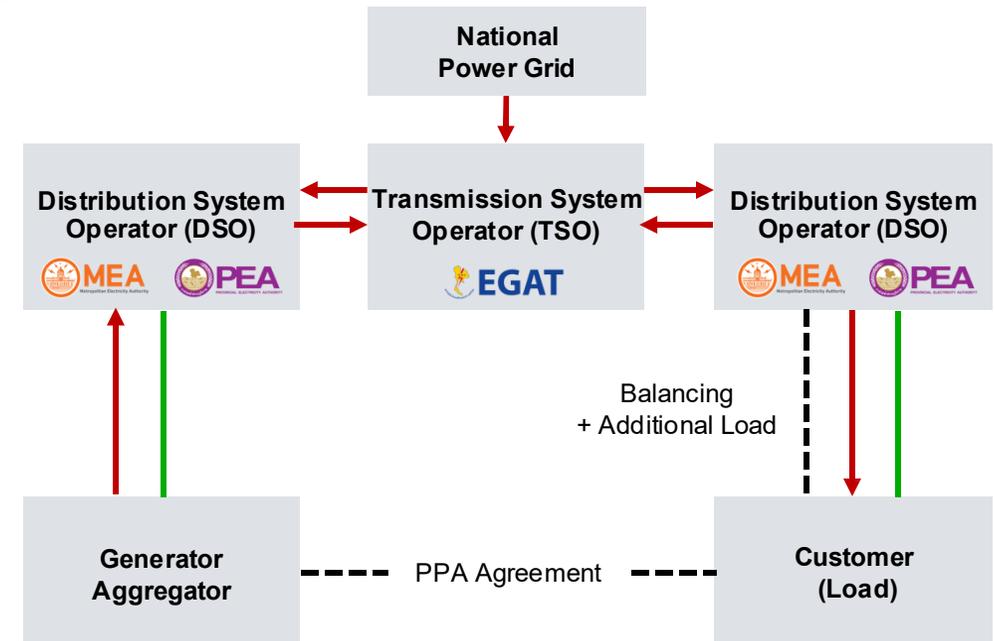
→ Power Flow   
 — TPA Agreement   
 - - - PPA Agreement

## 1 *Aggregator Business Model*



- - - PPA contract between **Generator** and **Customer** for RE purchase
- TPA contracted between **Generator** with **DSO** for RE supply
- - - PPA contract between **Generator** and **DSO** for Power Balancing

## 2 *P2P Bilateral Business Model*



- - - PPA contract between **Generator** and **Customer** for RE purchase
- TPA contract between **Generator** with **DSO** for RE supply
- TPA contract between **Customer (Load)** and **DSO** for RE supply
- - - PPA contract between **Customer (Load)** and **DSO** for Power Balancing

# DPPA Scheme offers a different pricing structure with additional imbalance penalty and policy expenses

## Pricing structure comparison between different RE schemes

Unit : THB/ kWh	Tariff	Energy Payment (EP/Import/Adde r/FiT)	Availability/Cap acity Payment (AP/CP)	Transmission Cost (EGAT)	Distribution Cost (PEA/MEA)	Policy Expense	
<b>Base</b>	4.1817	2.4786	0.7751	0.24	0.51	0.178	
<b>UGT 1</b>	4.2411	2.4786	0.7751	0.24	0.51	0.178	Premium (P) 0.0594

### Key Notes :

- Avg. tariff from all customer category excl. Ft
- Announced Tariff as of May 2023

- Limit 600MW from EGAT hydro-power
- First-Come, First-Serve
- REC from existing state-owned plant
- 1- year contract period
- Price subject to annual revision

UGT2	Tariff	Fixed Rate							Variable Rate		
		Energy Payment (EP)	Capacity Payment (CP)	Transmission (EGAT)	Administrative Wholesale	Wholesale to Retail Distribution Loss factor	Distribution Cost (PEA/MEA)	Administrative Retail	Policy Expense (Wholesale)	Wholesale to Retail Distribution Loss factor	Policy Expense (Retail)
<b>Port A</b>	4.5623	2.7289	0.5551	0.2418	0.0309	5.43%	0.5162	0.0499	0.1043	5.43%	0.1364
<b>Port B</b>	4.5474	2.7249	0.545	0.2418	0.0309	5.43%	0.5162	0.0499	0.1043	5.43%	0.1364

TPA	Tariff	Energy Payment (EP)	Wheeling Charge		Ancillary and System Services				Policy Expense	Imbalance	
			Transmission (EGAT)	Distribution (PEA/MEA)	Reserve and Backup (RB)	Frequency Regulation (FR)	Voltage Regulation (VR)	Black Start (BS)		Positive	Negative
	1.15 + X	X	0.4	0.54				0.21	0.178	0	0

**TPA Charge**

Under revision if applicable to charge

# Thailand Policy to unlock more energy transition solutions with various deregulation power market initiatives

- 2021

ERC Sandbox Phase 1
- 2023

ERC Sandbox Phase 2
- 2024

NEPC announce approval of Direct PPA 2000MW for FDI Data Center Business
- 2025

Jan - UGT 1

Jun - UGT 2

Q3 - Direct PPA commence

  - Demand Response, Micro Grid, RE Forecast, Aggregator, Battery Storage and EV

Announce New PDP 2025

แผน PDP 2024 ไม่คลอด รอความชัดเจนไฟฟ้าสีเขียวเฟส 2 จ่อเปลี่ยนใหม่ PDP 2025 หลับล่าช้ากว่า 3 ปี

## Data centres to boost Thai economy with over 320 billion baht

THURSDAY, APRIL 24, 2025

Thailand's Data Centre Industry Is Projected To Expand By 13.9 Times Between 2023 And 2028, Attracting Initial Investments Of Approximately 320 Billion Baht.

กทพ.จับมือ 3 การไฟฟ้าเปิดขายไฟฟ้าสีเขียวครั้งแรกในไทย



## พลังงานเล็งขยายโควตาโซลาร์ภาคประชาชนเป็น 400 เมกะวัตต์ต่อปี รอแผน PDP สำเร็จ คาดเปิดรับซื้อได้ปี 2568

MARCH 18, 2025 • ENERGY THAI CHAMBER

“ ขณะนี้คนไทยมีค่าใช้จ่ายมาก ภาครัฐจึงควรแบกรับส่วนต่างค่าไฟแทน ซึ่งเป็นที่มาของ **กรอบเป้าหมาย ค่าไฟไม่เกิน 3.99 บาทต่อหน่วย** **จากราคาหน่วยละ 4.15 บาทในปัจจุบัน** โดยให้ผล 4 เดือน เริ่มตั้งแต่เดือนพ.ค. - ส.ค. 2568 ”

พีระพันธุ์ สาลีรัฐวิภาค

## BOI boosts clean energy investment in Thailand to over THB560 billion in 10 years

SATURDAY, APRIL 19, 2025

The Thailand Board Of Investment (BOI) Is Driving Clean Energy Investment Across Over 2,900 Projects In The Past 10 Years, With A Total Value Exceeding 560 Billion Baht,...

ALTERNVIM

Thank You



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# INNOPOWER

REM ASIA 2025

KITIYA TAVORN

DECARBONIZATION PARTNERSHIP MANAGER  
INNOPOWER COMPANY LIMITED



# EGAT

STATE-OWNED ELECTRICITY  
& UTILITY ENTERPRISE



# EGCO

GROUP

INDEPENDENT POWER PRODUCER  
IN THAILAND



# RATCH

GROUP

INDEPENDENT POWER PRODUCER  
IN THAILAND



# INNOPOWER

ACCELERATE  
ENERGY ***INNOVATIONS***  
FOR SUSTAINABLE  
ENERGY ***TRANSITION***



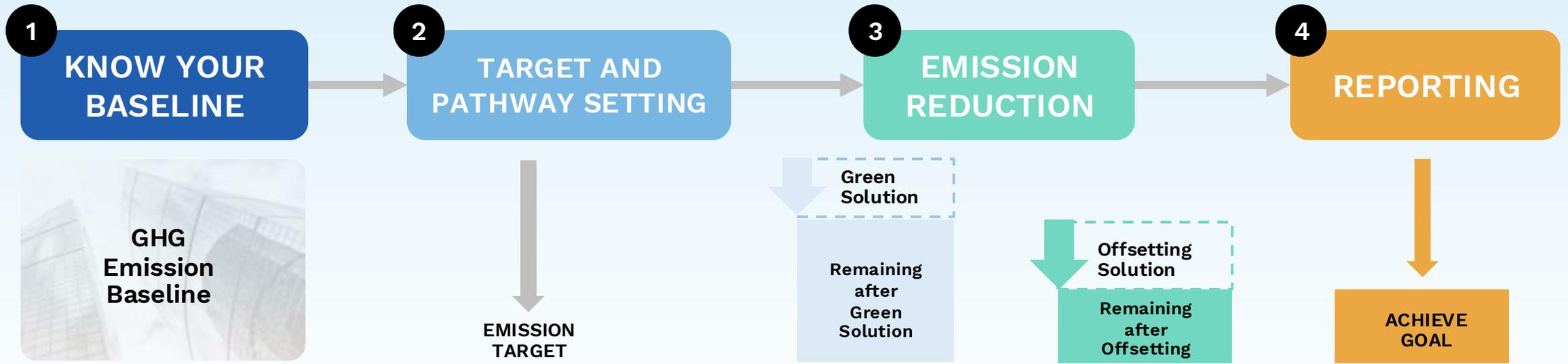
# INNOPOWER AS A DECARBONIZATION PARTNER

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# INNOPOWER AS A DECARBONIZATION PARTNER

Mission : Standing side by side with customer for Decarbonization Achievement



INNOPOWER



GHG REPORTING



TARGET SETTING & CONSULTANT SERVICE



FUTURE OF MOBILITY



FUTURE OF ENERGY



RECs

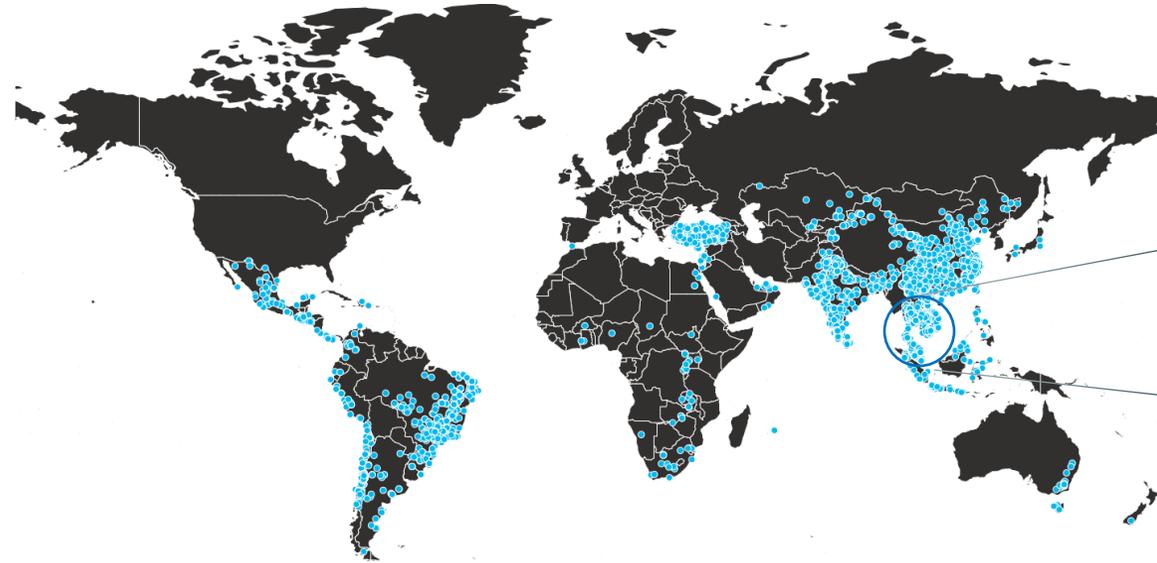


CARBON CREDIT



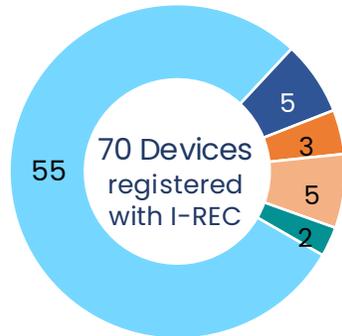
FULL REPORTING

# THE GROWTH OF I-REC(E) MARKET IN THAILAND



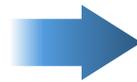
In 2022, the Electricity Generating Authority of Thailand (EGAT) was officially appointed by the I-TRACK Foundation (as the **Local Issuer** for Thailand under the I-REC(E) Standard.

Total Installed Capacity  
as of 12-Jul-2021  
**1,567.90 MW**

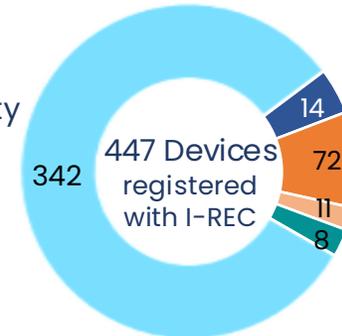


■ Solar ■ Wind ■ Biomass ■ Biogas ■ Hydro

**Jul 2021**



Total Installed Capacity  
as of 28-Feb-2025  
**6,036.62 MW**



■ Solar ■ Wind ■ Biomass ■ Biogas ■ Hydro

**Feb 2025**

↑ **285%**

RE100 MEMBERS

OVER 400 MEMBERS  
 HAVE MADE A  
 COMMITMENT TO GO  
 ‘100%  
 RENEWABLE’



# RE100 MEMBER RECOGNIZED PROCUREMENT TYPES OF RENEWABLE ELECTRICITY

RE100 categorizes corporate procurement of renewable electricity into five broad types. They differ in terms of the party being contracted with (directly with a generator or through a more conventional contract with an electricity supplier), whether the procurement of energy and energy attributes is bundled or unbundled, and active versus passive procurement.

- 1 **Self-generation from facilities owned by the company**
- 2 **Direct procurement (contracts with generators)**
  - 2.1 *Physical power purchase agreement (physical PPA)*
  - 2.2 *Financial power purchase agreement (financial/virtual PPA)*
- 3 **Contracts with electricity suppliers -> UTILITY GREEN TARIFF (UGT)**
  - 3.1 *Project-specific supply contract with electricity supplier -> UGT 2*
  - 3.2 *Retail supply contract with electricity supplier -> UGT 1*
- 4 **Unbundled procurement of energy attribute certificates (EACs)**
- 5 **Passive procurement**
  - 5.1 *Default delivered renewable electricity from the grid, supported by EACs*
  - 5.2 *Default delivered renewable electricity from the grid in a market with at least a 95% renewable generation mix and where there is no mechanism for specifically allocating renewable electricity*



# THAILAND'S PATHWAY OF GREEN ELECTRICITY

**Utility Green Tariff (UGT) is Thailand's New Option for Green Electricity Procurement.** It is a voluntary utility program that allow eligible customers to buy both the energy and associated renewable energy certificates (RECs) from a large-scale renewable energy project through a customer's current electricity bill.

## UTILITY

Embedded within Thailand's existing regulated market and operated by power utilities



## GREEN

Global standard Renewable Energy Certificate (REC) certified by I-TRACK



## TARIFF

UGT1 (Unspecified)  
UGT2 (Specified)  
Regulated by ERC



Drive Additional RE \*UGT2



Traceability  
Certified Sources & Load



Bundled with EAC



Long-term Commitment \*UGT2



Ready for 2025 Target

# How Utility Green Tariff (UGT) works



Drive **Additional RE** \*UGT2



**Traceability**

Certified Sources & Load



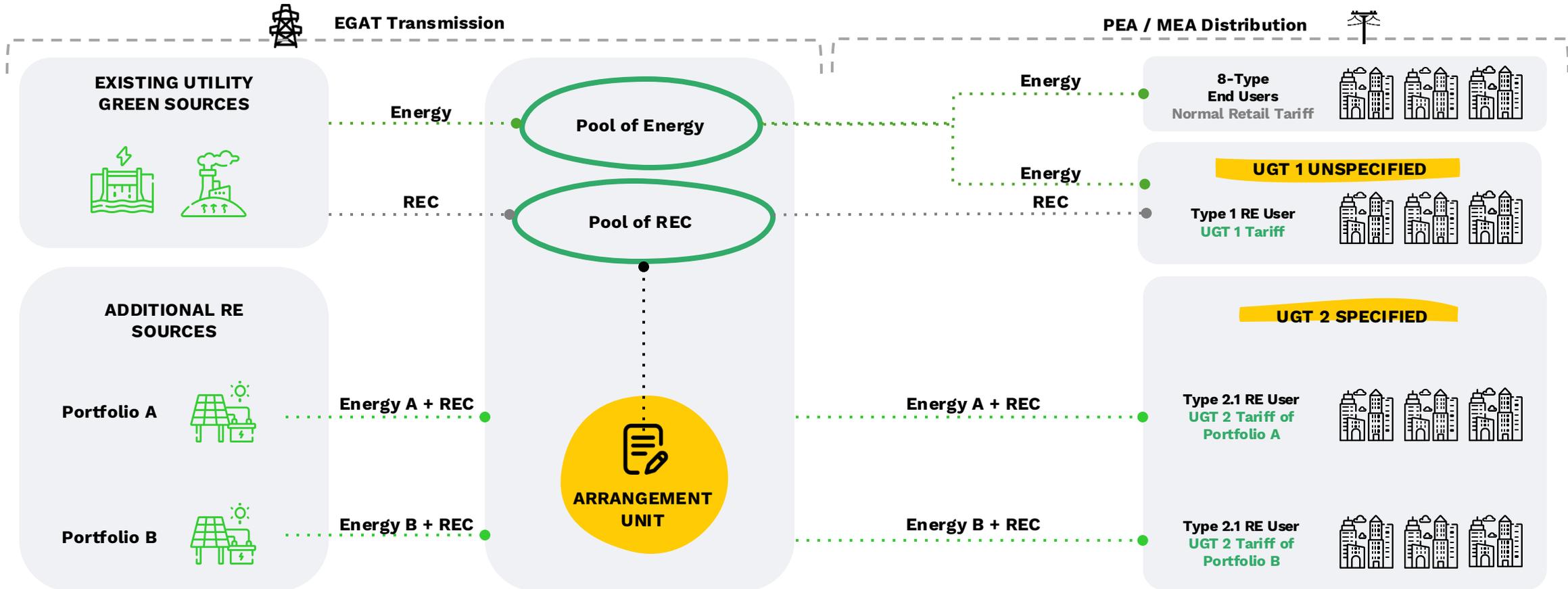
**Bundled with EAC**



**Long-term Commitment** \*UGT2



Ready for **2025 Target**



# INTERNATIONAL RENEWABLE ENERGY CERTIFICATE FOR ELECTRICITY (I-REC(E))

## Unbundle EAC AS AN OFFSETTING SOLUTION

A REC (Renewable Energy Certificate) is a type of Energy Attribute Certificate (EAC) that represents the environmental attributes of the generation of a one-megawatt hour (MWh) of energy produced by renewable sources.

### BENEFIT OF REC

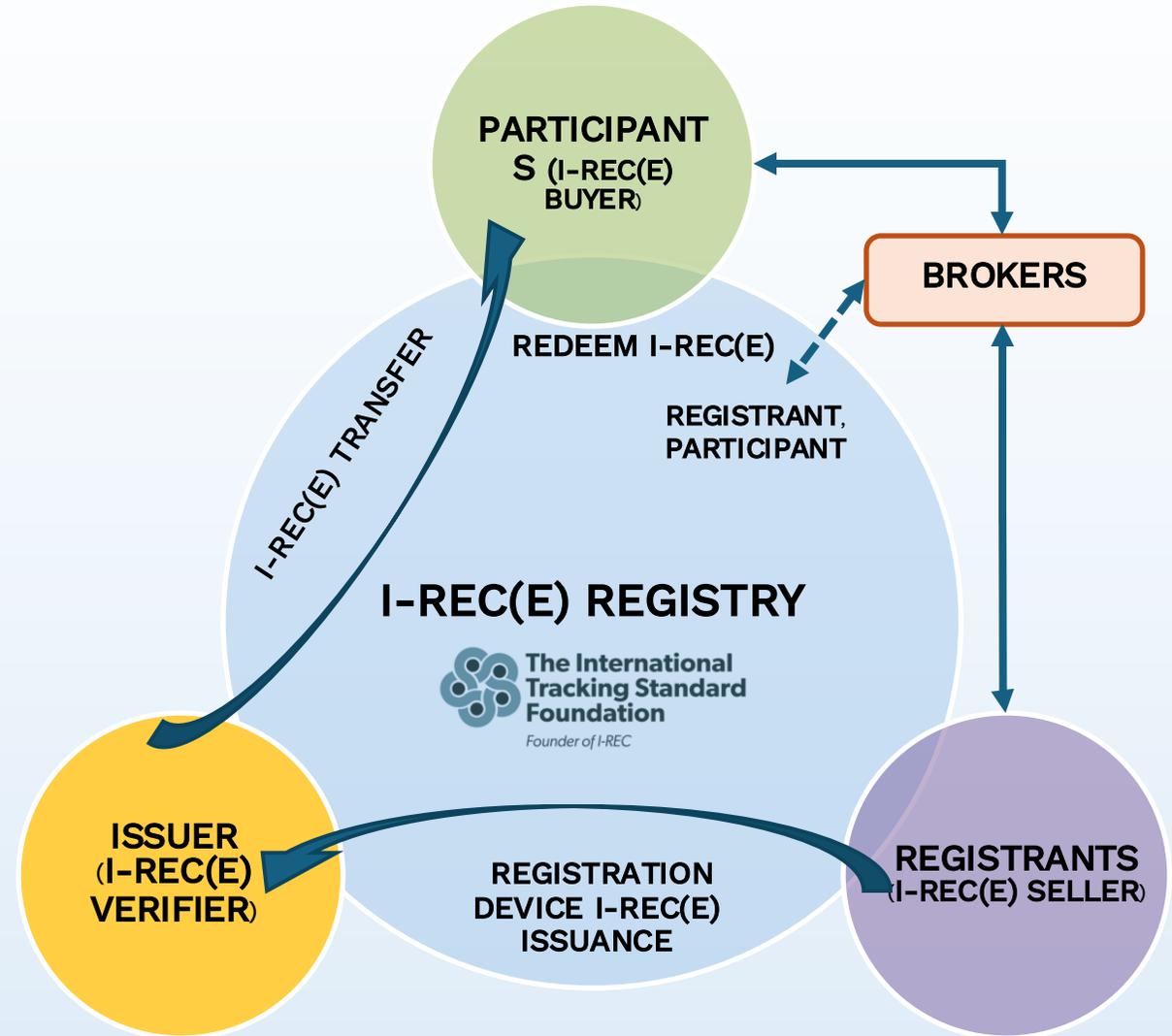
Reduce the impact of energy use, or Scope 2

Meet company sustainability goals and international reporting standard such as RE100, CDP, SBTi, LEED

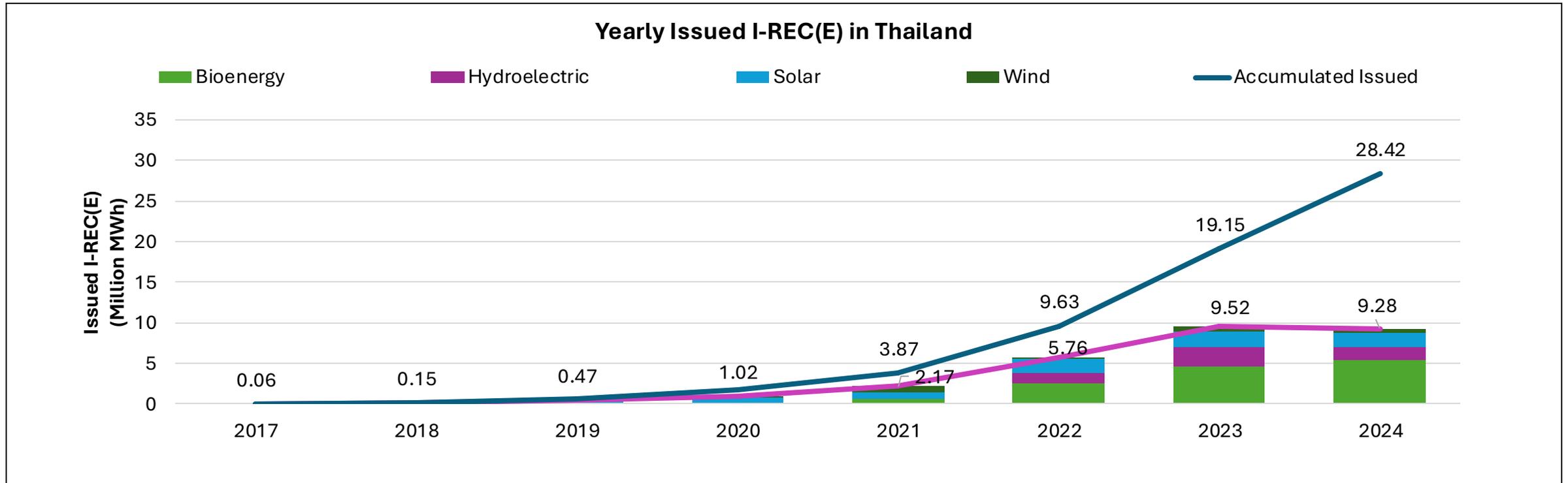


SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



# Unbundle I-REC(E) Market in Thailand



From 2017 - 2024, Thailand's RECs issuance has achieved an impressive average growth rate of **105.48% CAGR**. This significant expansion reflects the country's strong momentum in renewable energy development and increasing demand for verified clean energy sourcing.

In 2024, the volume of REC issuances slightly declined. This adjustment reflects the market's learning in response to an oversupply situation.

Despite the decrease in issuances, the volume of REC redemptions continued to rise, signaling stronger demand for renewable energy claims and a shift towards active REC utilization.

# CARBON CREDIT

- The dynamics of the REC market, impacting both the supply and demand sides. The market for RECs is driven by several key factors:

## ▶ THAILAND LOCAL STANDARD

- Standard T-Ver
- Premium T-Ver



## ▶ INTERNATIONAL STANDARD

- VERRA
- GOLD STANDARD





# INNOPOWER

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