

MARKET SPOTLIGHT: THAILAND



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Tuesday, 21 April 4:00-4:45 PM

Market Spotlight: Thailand

From Past to Present of Thailand's Renewable Energy Power Market

Tuesday April 21st, 2026

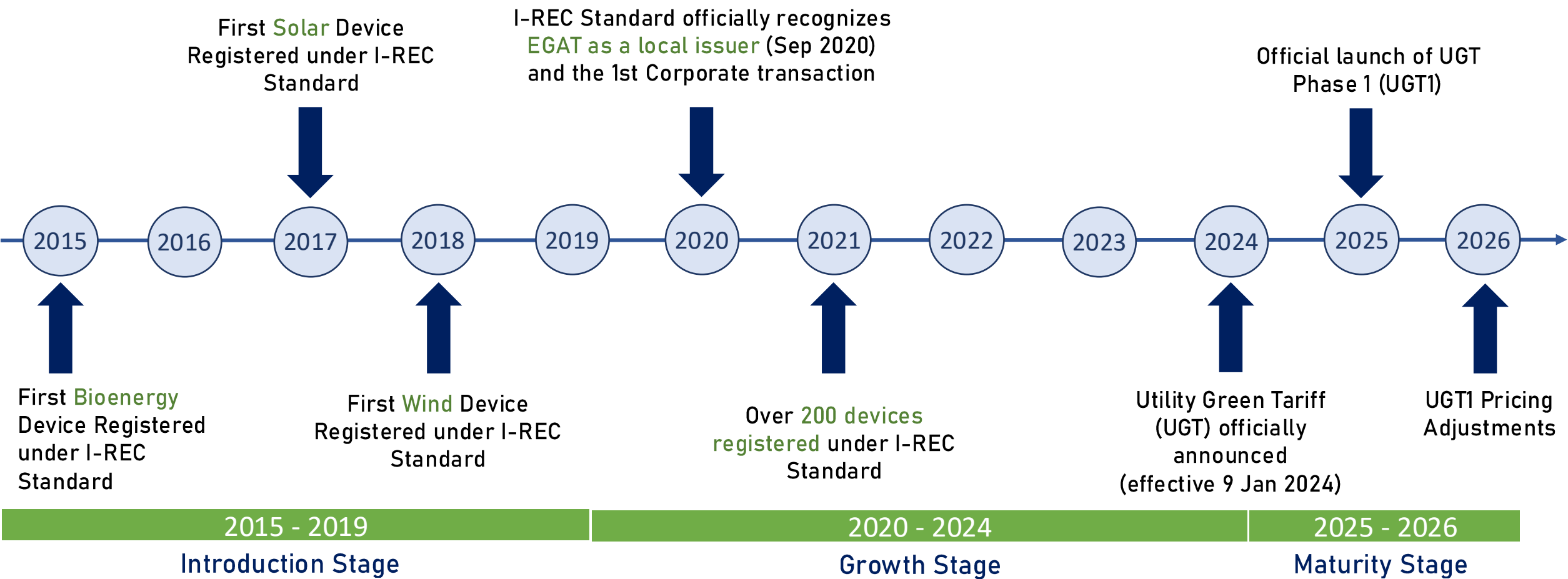


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Thailand's Renewable Energy & I-REC Market Milestones



From Past to Present of Thailand's Renewable Energy Power Market

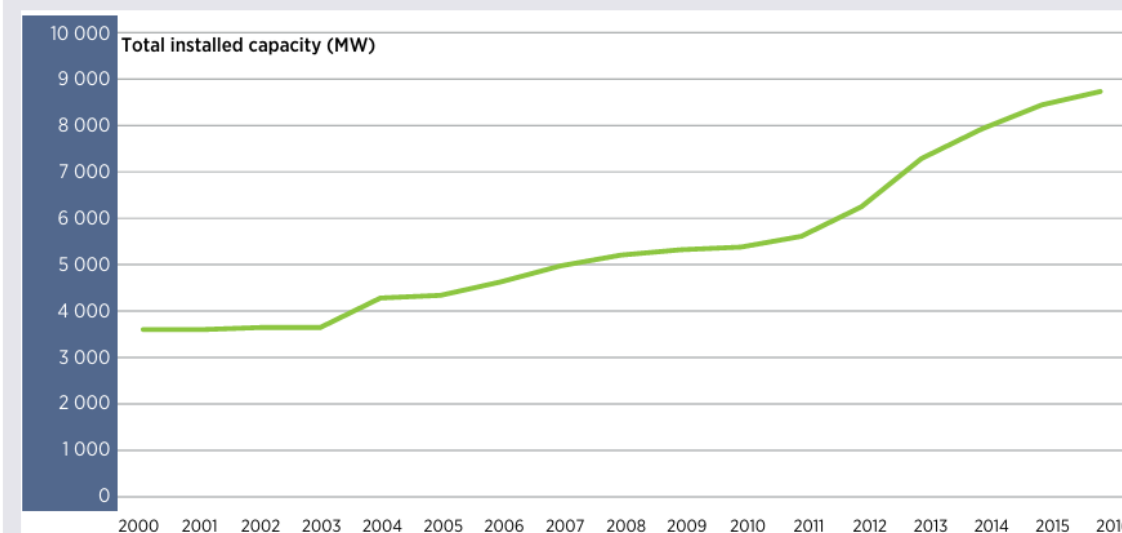
Introduction Stage (2015–2019)



Policy-driven growth of Thailand's renewable energy market

- Strong government incentives accelerated renewable deployment
- Key technologies: **Solar, Biomass/Biogas, Wind, Hydro**
- Introduction of **Adder Tariff** and **Feed-in Tariff (FiT)** improved investment attractiveness
- Limited international REC tracking mechanisms prior to market standardization

Figure 9. Thailand's total renewable electricity generating capacity, 2000-2016



Note: MW = megawatt.

Source: Based on IRENA's statistics database, at <http://resourceirena.irena.org/gateway/dashboard/?topic=4&subTopic=16>.

From Past to Present of Thailand's Renewable Energy Power Market



Emerging Stage (2015–2019)

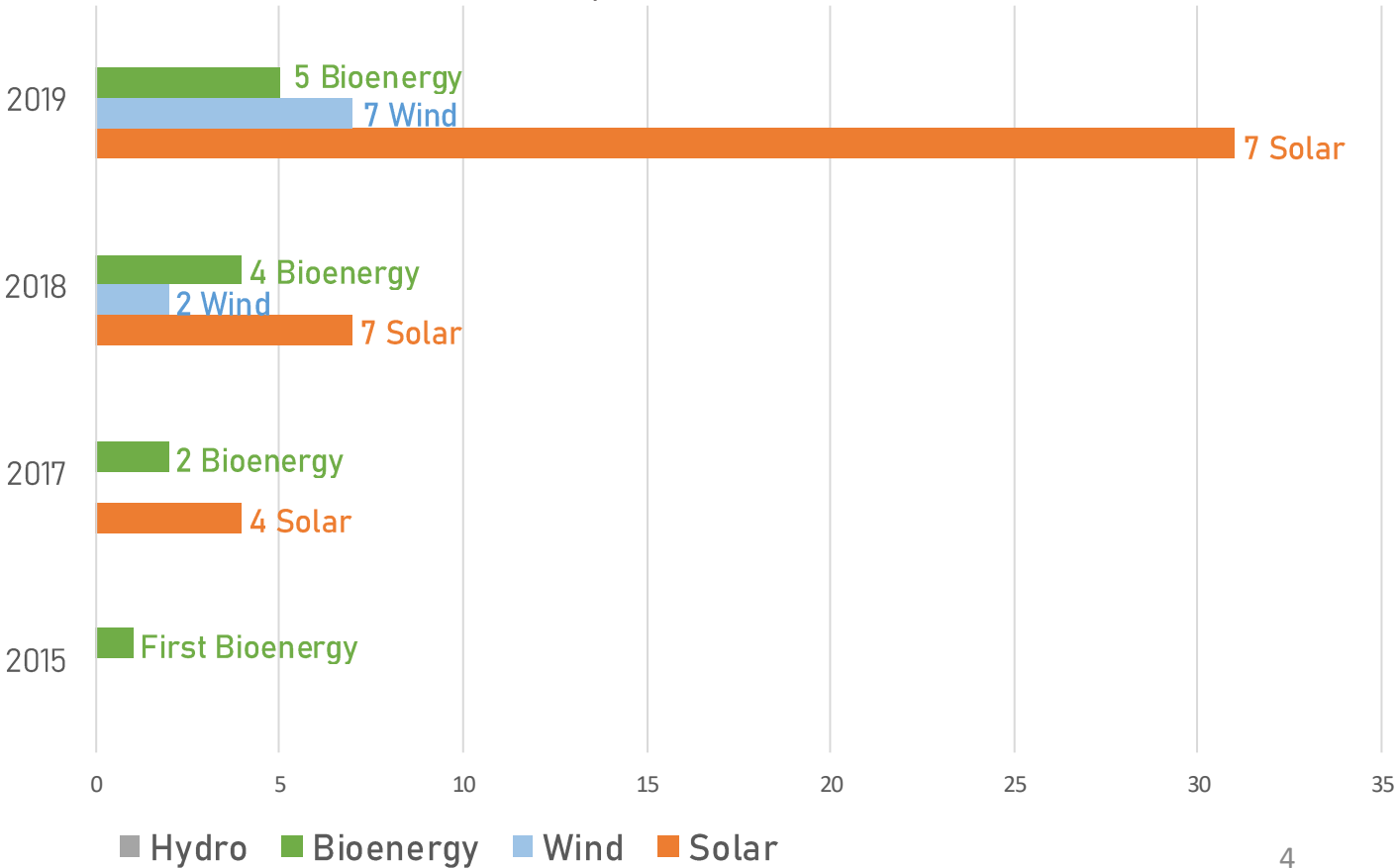


I-REC Introduction Phase (2018–2019)

- Thailand entered the **I-REC Standard system**
- Initial renewable project registrations began
- Market awareness among buyers remained limited
- Adoption driven by large corporates (ESG & RE100)

Growth of I-REC Registered Facilities (2015 – 2019)

Data based on I-RECs Market Statistic as of February 2026



From Past to Present of Thailand's Renewable Energy Power Market



Growth Stage (2020 - 2024)

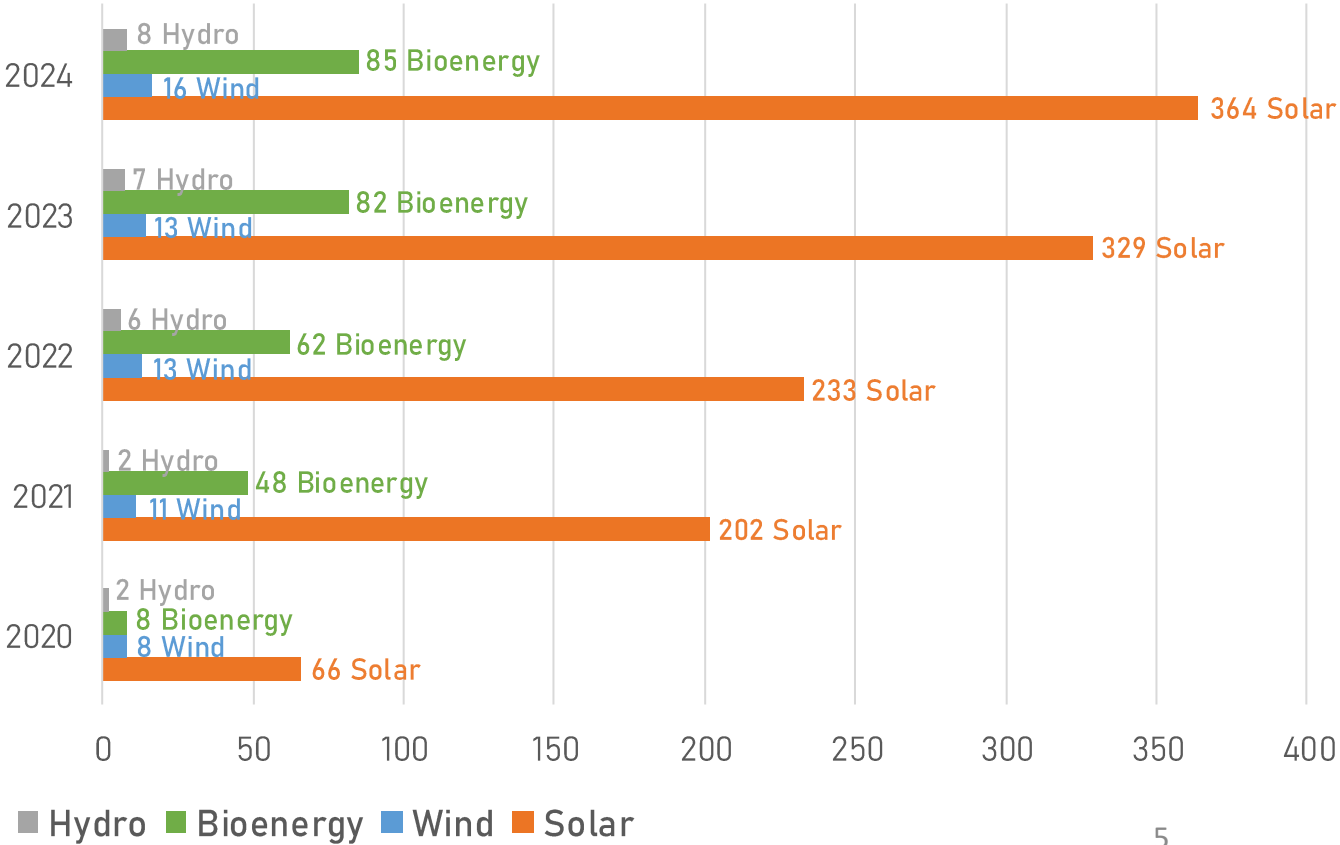


Growth Phase of I-REC in Thailand (2020-2024)

- EGAT accredited as a **local issuer**
- Growing demand from corporates (RE100, ESG goals)
- Market becomes more structured
- Transition toward more transparent & liquid market
- **Utility Green Tariff (UGT)** Pilot Project introduced

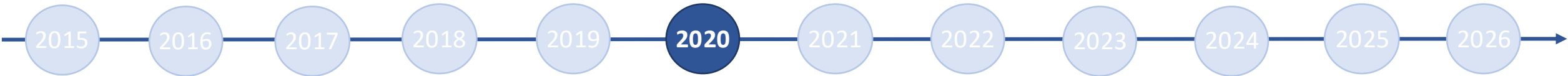
Growth of I-REC Registered Facilities (2020 - 2024)

Data based on I-RECs Market Statistic as of February 2026



From Past to Present of Thailand's Renewable Energy Power Market

Launch of I-REC Market in Thailand (September 2020)



- Electricity Generating Authority of Thailand (EGAT) accredited as a **local issuer** on **29 September 2020**
- Enabled credible tracking of renewable electricity consumption
- Toyota Motor Thailand purchased **10,000 I-RECs** of large hydro by 50 THB/MWh

Toyota buys Egat's first REC for fuel

PUBLISHED : 9 OCT 2020 AT 04:00
NEWSPAPER SECTION: BUSINESS WRITER: YUTHANA PRAIWAN

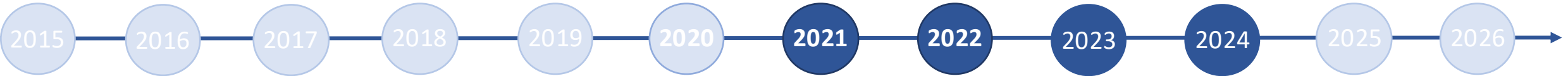


Mr Viboon says Toyota bought 10,000 RECs for 500,000 baht from Egat.

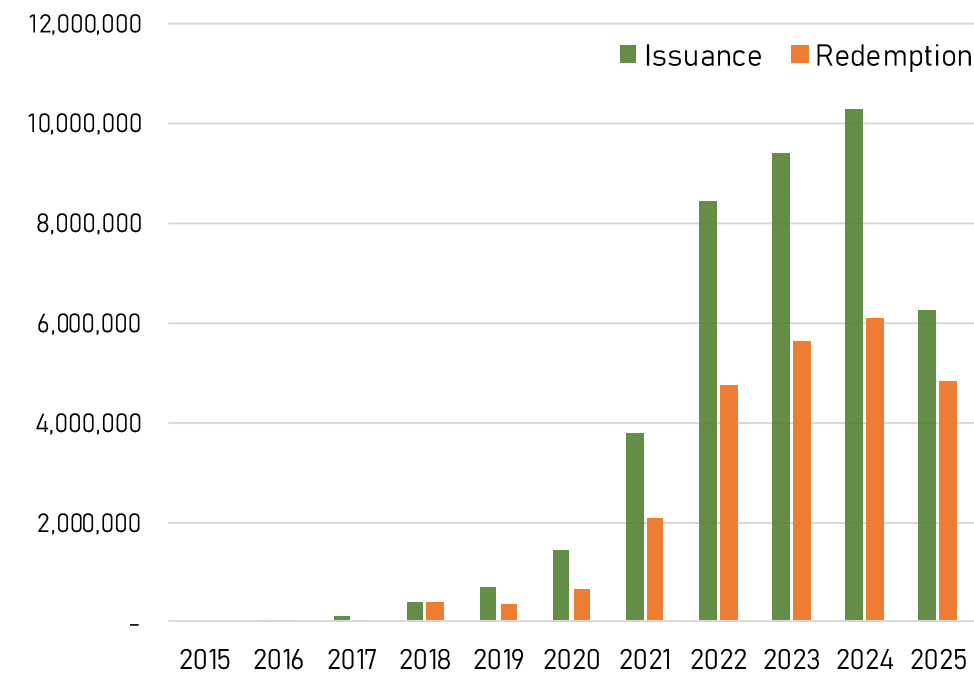
Demand-Led Expansion of I-REC Market (2021–2022)



Growth Stage (2020 - 2024)



Issuance Vs Redemption Certificates (MWh)



Rapid increase in facility registrations and certificate issuance
Entry of new market players (traders, platforms, aggregators)

Renewable Energy Procurement Regulation by Energy Regulatory Commission (ERC) September B.E. 2565 (2022)

หน้า ๓
เล่ม ๑๓๙ ตอนพิเศษ ๒๒๙ ง ราชกิจจานุเบกษา ๒๗ กันยายน ๒๕๖๕

ระเบียบคณะกรรมการกำกับกิจการพลังงาน

ว่าด้วยการจัดหาไฟฟ้าจากพลังงานหมุนเวียนในรูปแบบ Feed-in Tariff (FIT)

ปี ๒๕๖๕ - ๒๕๗๓ สำหรับกลุ่มไม่มีต้นทุนเชื้อเพลิง

พ.ศ. ๒๕๖๕

โดยที่เป็นการสมควรกำหนดหลักเกณฑ์และวิธีการจัดหาไฟฟ้าจากพลังงานหมุนเวียนในรูปแบบ Feed-in Tariff (FIT) ปี ๒๕๖๕ - ๒๕๗๓ สำหรับกลุ่มไม่มีต้นทุนเชื้อเพลิง เพื่อสนับสนุนให้ประเทศไทยสามารถมุ่งสู่พลังงานสะอาดและลดการปลดปล่อยก๊าซคาร์บอนไดออกไซด์สุทธิเป็นศูนย์ (Net - Zero Carbon Emission) ตามมติคณะกรรมการนโยบายพลังงานแห่งชาติ ในการประชุมครั้งที่ ๓/๒๕๖๕ (ครั้งที่ ๑๕๘) เมื่อวันที่ ๖ พฤษภาคม ๒๕๖๕ และมติคณะกรรมการบริหารนโยบายพลังงาน ในการประชุมครั้งที่ ๘/๒๕๖๕ (ครั้งที่ ๔๖) เมื่อวันที่ ๒๙ เมษายน ๒๕๖๕ และในการประชุมครั้งที่ ๑๒/๒๕๖๕ (ครั้งที่ ๕๐) เมื่อวันที่ ๒๒ สิงหาคม ๒๕๖๕ กำหนดให้จัดหาไฟฟ้าจากพลังงานหมุนเวียนตามแผนการเพิ่มการผลิตไฟฟ้าจากพลังงานสะอาด ภายใต้แผนพัฒนาการผลิตไฟฟ้าของประเทศไทย พ.ศ. ๒๕๖๑ - ๒๕๘๐ ฉบับปรับปรุงครั้งที่ ๑ (PDP๒๐๑๘ Rev.๑) ในช่วงปี พ.ศ. ๒๕๖๔ - ๒๕๗๓ (ปรับปรุงเพิ่มเติม) โดยพิจารณาจากเกณฑ์คุณสมบัติและความพร้อม

Ref: Regulation of the Energy Regulatory Commission (ERC) on Procurement of Electricity from Renewable Energy under the Feed-in Tariff (FIT) Scheme for the No-Fuel-Cost Group (2022–2030), B.E. 2565 (2022)

From Past to Present of Thailand's Renewable Energy Power Market



Maturity Stage (2025 - 2026)



UGT (Utility-Based Mechanism) in 2024

Premium (P)

(Draft) UGT1 Proposal

→ RECs are from EGAT's 7 hydro power plants*

UGT1

= Normal Tariff incl. F_t + Premium (P)

Where:

Premium (P)

= Market Price of REC (P_{REC}) + Administrative Fee (P_A)

0.0594

0.0500

0.0094

THB/kWh retail

* Existing RE plants in the system that REC belongs to the state. In 2024, this will be EGAT's 7 hydro power plants with approximate generation output of 1,300 - 3,500 GWh/year

EGAT

PEA

8

Exchange rate 1 USD = 34.4502 THB as of November 2024

- Price: ~1.72 USD/MWh (59.4 THB/MWh)
- Technology: Hydro (EGAT supply)
- Government-supported mechanism

UGT1 premium rate in 2026

The Energy Regulatory Commission (ERC) has released the proposed UGT1 premium rate for 2026 at 0.0375 THB/kWh or 37.5 THB/MWh (~1.18 USD/MWh). This represents a decrease from the 2025 approximately 37%

4. สรุปข้อเสนอค่า Premium สำหรับการให้บริการ UGT1 แก่ผู้ใช้ไฟฟ้าในปี 2569 เท่ากับ 0.0375 บาท/หน่วย ลดลง 0.0219 บาท/หน่วย (37%) จากปี 2568 โดยมีรายละเอียดการคำนวณตามสูตรการกำหนด UGT1 ดังนี้

$$\begin{aligned} \text{Premium (P)} &= P_{REC} + P_{A \text{ กฟผ.}} + \bar{P}_{A \text{ กฟน. กฟภ.}} \\ &= 0.0286 + 0.0028 + 0.0061 \\ &= 0.0375 \text{ บาท/หน่วย} \end{aligned}$$

From Past to Present of Thailand's Renewable Energy Power Market

Maturity Stage (2025 – 2026)



Thailand I-REC Market (Competitive / Market-Based)

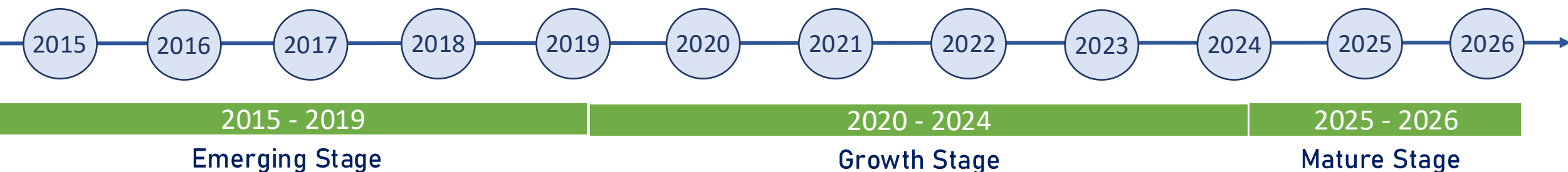
Market Outlook (2025 – 2026)

- Oversupply due to new renewable projects entering the market
- Growing demand from multinational corporations (RE100 members) and export-oriented Thai companies
- Development of local and global trading platforms

Challenge

- Increase in power generation assets undergoing repowering
- Unclear how repowering is reflected in I-REC certificates

Key Takeaways



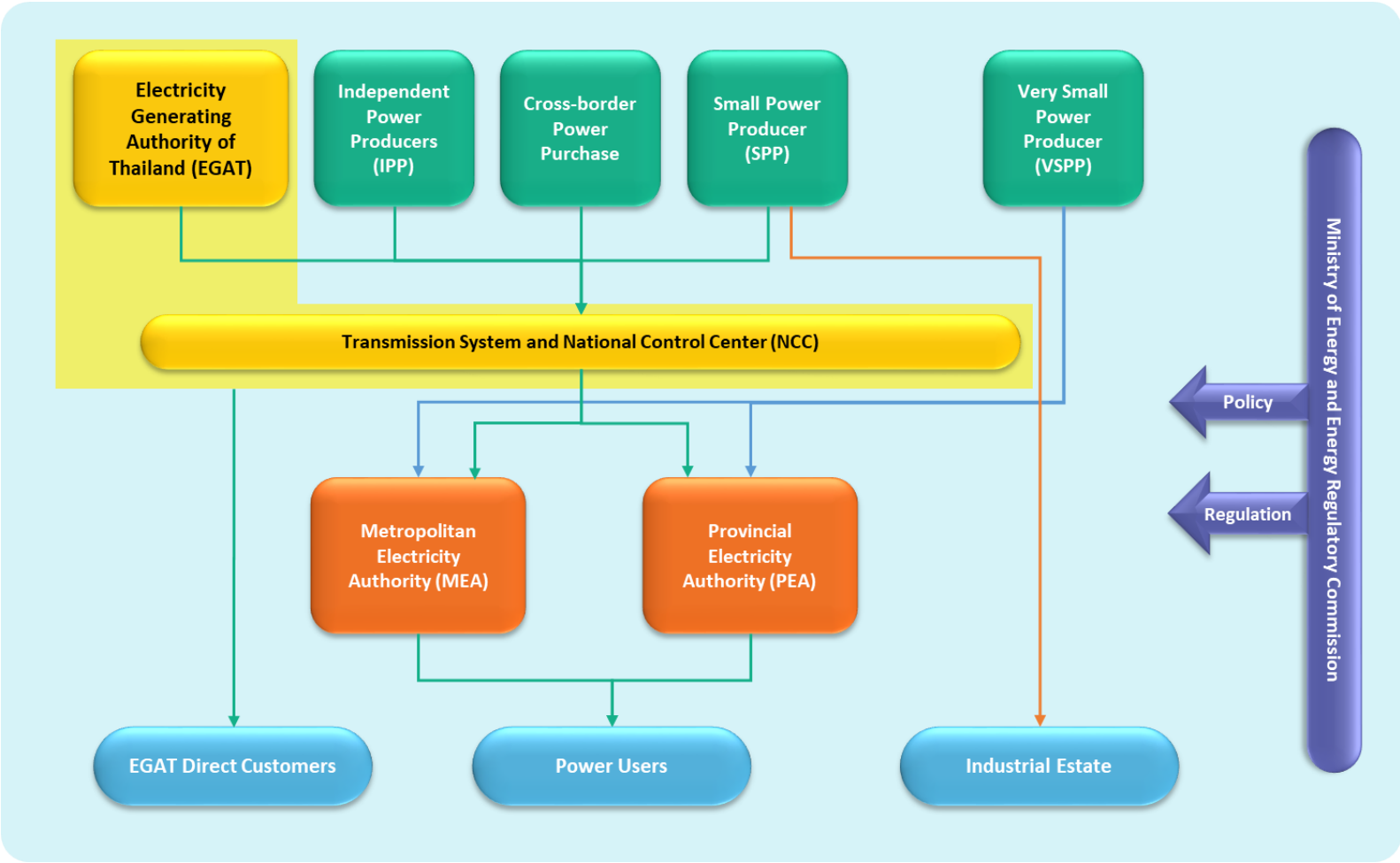
- I-REC are evolving into a core instrument for corporate decarbonization, not just a supplementary tool
- Re-powering of existing renewable facilities will support in stabilizing the I-REC market and RE100 demand
- Progress toward electricity market liberalization will be a critical enabler for renewable growth
- Scaling direct renewable procurement (Direct PPAs) will accelerate corporate clean energy adoption

Procurement options

3.1 Thailand's Electricity Industry Structure

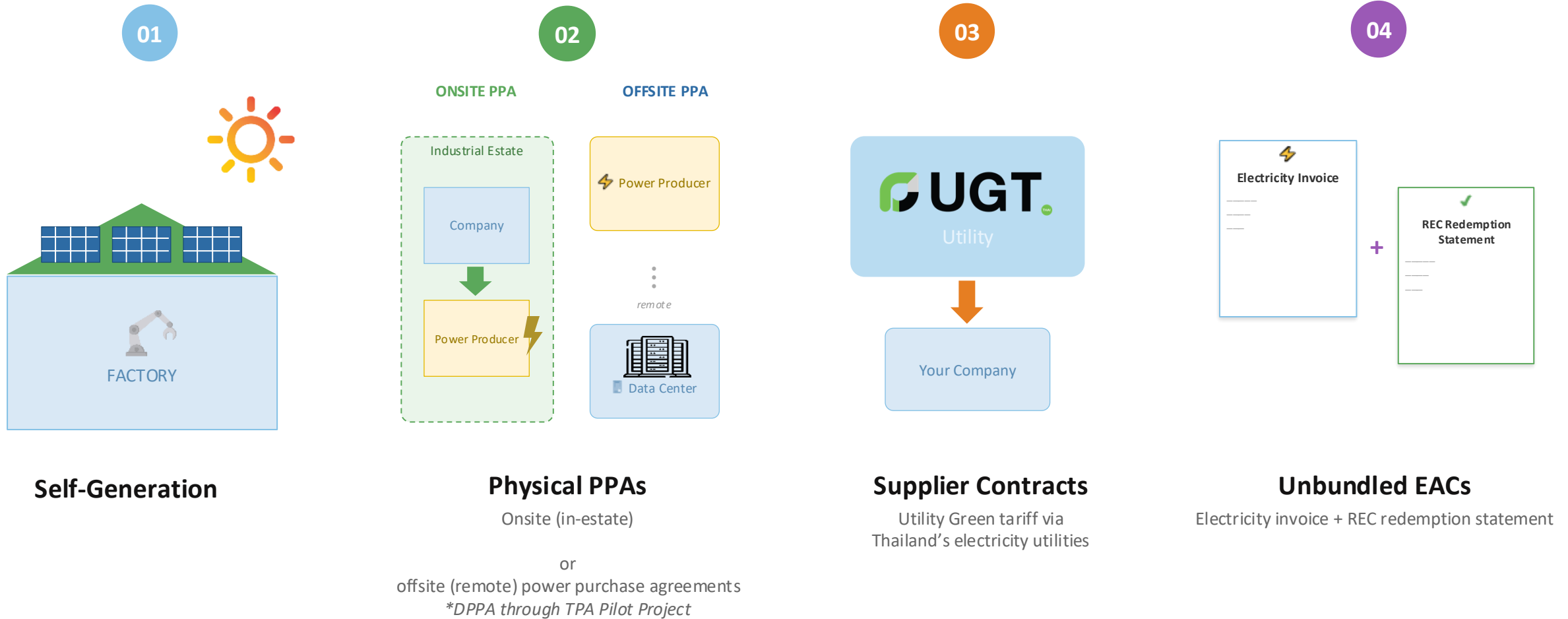
Thailand's Electricity Industry Structure is state-owned enhanced Single Buyer (ESB). Electricity Generating Authority of Thailand (EGAT) is the primary electricity supplier and sole buyer from Independent Power Producers (IPP), Small Power Producer (SPP) and Cross-border Power Purchase with its own transmission system.

In Thailand, the transition towards renewable energy consumption is a voluntary market



3.2 RE Procurement Options

Available in Thailand



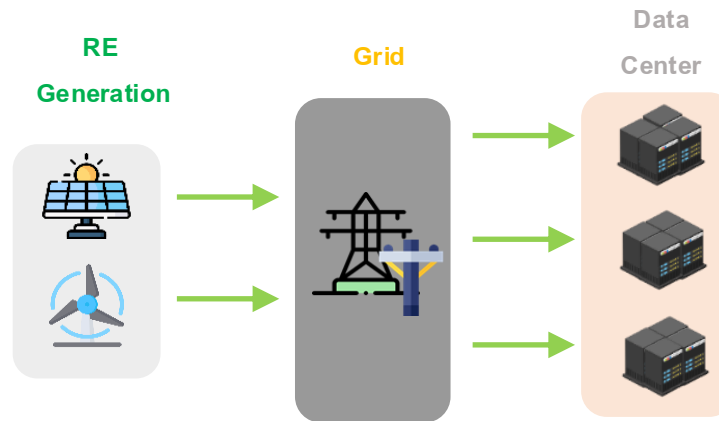
3.3 Direct PPA

(Pilot Project for Data Center)

Thailand is launching a pilot project to enable Data Centers to procure renewable energy directly (Direct PPA) through Third Party Access (TPA).

- The target capacity is **2,000 MW**.
- Renewable energy power plants **do not sell electricity back** into grid system.
- Power Producers must **not have PPA (or already expired) with grid utilities (EGAT, PEA, MEA)**.
- Participants must strictly comply with **Grid Code and TPA Code**.
- Data Center can purchase electricity from **multiple power producers** and **grid utilities** during without TPA service.

- Installed capacity of **1,000 kVA or higher**
- **Grid system** can accommodate the connection.

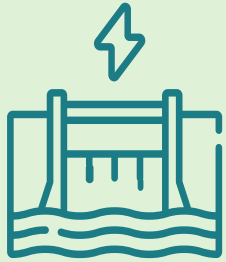


- A large-scale investment project **received investment promotion from the Board of Investment (BOI)**
- Electricity utilization plan for **a minimum of 10 years**.

Wheeling Charges:

- Transmission Charge
- Distribution Charge
- System Security/ Ancillary Service
- Policy Expense
- Imbalance Charge
- Others such as Connection Charge, ATC, etc.

3.4 Utility Green Tariff

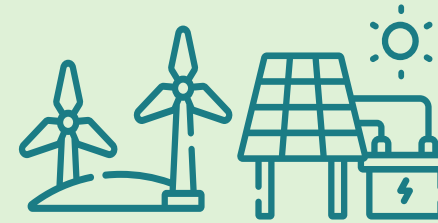


RE source:
Hydropower

UTILITY GREEN TARIFF 1

USER-UNSPECIFIED green energy from existing RE capacity with RECs redeemed on behalf of end users

- ◆ Eligible for all Electricity Users
- ◆ Top up premium on regular bills
- ◆ Demand-supply matching on UGT Platform
- ◆ Annual subscription
- ◆ Applications accepted quarterly



RE source:
Solar, Solar+BESS, Wind

UTILITY GREEN TARIFF 2

USER-SPECIFIED green energy from new RE capacity with RECs redeemed on behalf of end users

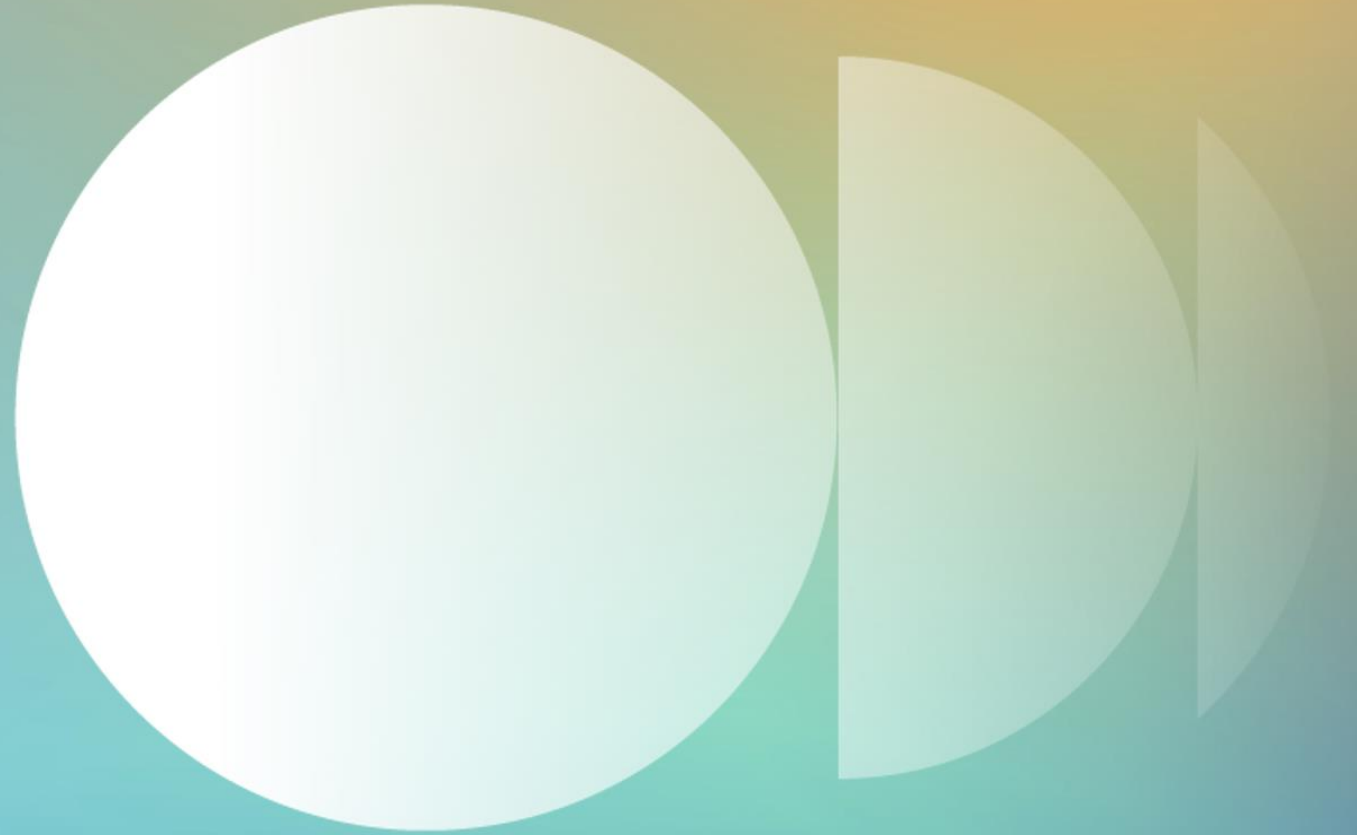
- ◆ Eligible for Electricity Users Type 4 and 5
- ◆ New tariff structure (not uniform)
- ◆ Demand-supply matching on UGT Platform
- ◆ 10-year contract

Impacts to the Market: Opportunities and Challenges



REM ASIA 2026

IGNITE ENERGY
INNOVATIONS
FOR TOMORROW



Thailand's Market Is Moving from Awareness to Decision

The conversation is becoming more practical, more commercial, and more strategic

Market shift

Few years earlier

- Limited awareness of RECs, carbon credits, and decarbonization instruments
- Questions focused on why renewable energy matters
- Interest was still exploratory and high-level



Today

- Companies ask how to procure, claim, and report
- More options are shaping real procurement choices
- Decisions now affect supply chains, investors, customers, and competitiveness

The market is no longer only exploring renewable procurement — it is increasingly deciding how to use it.

More market knowledge

Participants understand the instruments better and ask more informed questions.

More commercial questions

Discussion has shifted from “why” to “how” — including procurement, claims, and reporting.

More serious decisions

Choices increasingly link to internal targets, external pressure, and long-term competitiveness.

From Option Availability to Market Usability

The issue is no longer only whether options exist, but whether participants can use them with clarity, confidence, and execution.

Clarity

Even with multiple options in the market, participation is not easy if buyers do not understand:

- how the options differ
- what each option addresses
- when it should be used
- what limitations may apply
- which goals it best fits

Confidence

Understanding alone does not drive action. Buyers also need confidence in:

- the credibility of the claim
- the process and counterparties
- traceability and compliance
- reputational implications

Weak confidence slows transactions.

Execution

Even with clarity and confidence, the market can still slow down if execution remains difficult:

- too many parties to coordinate
- long internal approvals
- time-consuming documentation
- weak buyer–seller connection

Interest does not automatically become action.

Market Impacts in Practice

When gaps in clarity, confidence, and execution remain unresolved, they create real impacts for buyers, sellers, and market growth.

Buyer Impacts

The challenge is no longer lack of interest; it is decision complexity.

- confusion over how options differ
- difficulty comparing cost, speed, flexibility, and credibility
- no single option fits every objective
- strong concern over claims, governance, and reputational risk

Result: decisions slow down even when interest exists.

Seller Impacts

The challenge is no longer only supply; it is efficient access to market.

- route to market is not always clear
- demand is fragmented and uneven
- buyer requirements are becoming more sophisticated
- transactions require more time, effort, and coordination

Result: supply does not convert into demand as efficiently as it could.

Key implication: the market may grow more slowly than its potential if friction across both sides is not reduced.

What Will Unlock the Next Phase of Market Growth?

Growth will depend not only on having more options, but on making those options easier to understand, trust, and execute.

Simpler pathways

Make the journey easier to start for both buyers and sellers. Reduce unnecessary complexity, clarify the path to market, and lower the effort required to participate.

Clearer market communication

Translate policy, technical, and commercial language into terms that participants can actually use. Explain what each option is, who it fits, and what outcomes it can deliver.

Stronger confidence

Build trust in the process, counterparties, claims, and execution. Stronger confidence makes decisions easier, encourages seller effort, and supports repeat transactions.

Better coordination across market actors

Connect policy, utilities, corporates, project owners, enablers, and verification players more effectively so that the market becomes easier to navigate and scale.

Goal: reduce friction so buyers and sellers can participate more easily and more confidently.

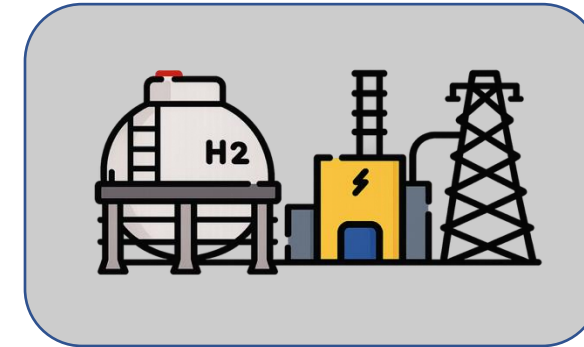
**EGAT pathway to reduce
carbon and grid flexibility**

Floating Solar PV with Hydro Power Plant Project



Hydrogen Blending Plan

EGAT plans to blending hydrogen with natural gas at a ratio of 5% (by volume) for gas turbine power plant from year 2030.



Small Modular Reactor (SMR)

(Drafted PDP 2024).



Pumped Storage Hydropower (PSH)

Current

Lamtakong Power Plant



Capacity of 1,000 MW

Srinagarind Dam



Capacity of 360 MW

Bhumibol Dam



Capacity of 171 MW

Future

Chulabhorn Dam



Capacity of 800 MW
(2034)

Vajiralongkorn Dam



Capacity of 891 MW
(2036)

Kathun Dam



Capacity of 780 MW
(2037)

Battery Energy Storage System (BESS)

EGAT has implemented grid-scale BESS installations connected to the transmission system

Bamnet Narong Substation



16 MW capacity
(16 MWh storage)

Chai Badan Substation



21 MW capacity
(21 MWh storage)

Mae Hong Son Smart Grid Project



5 MW capacity
(6 MWh storage)

Static Synchronous Compensator (STATCOM)

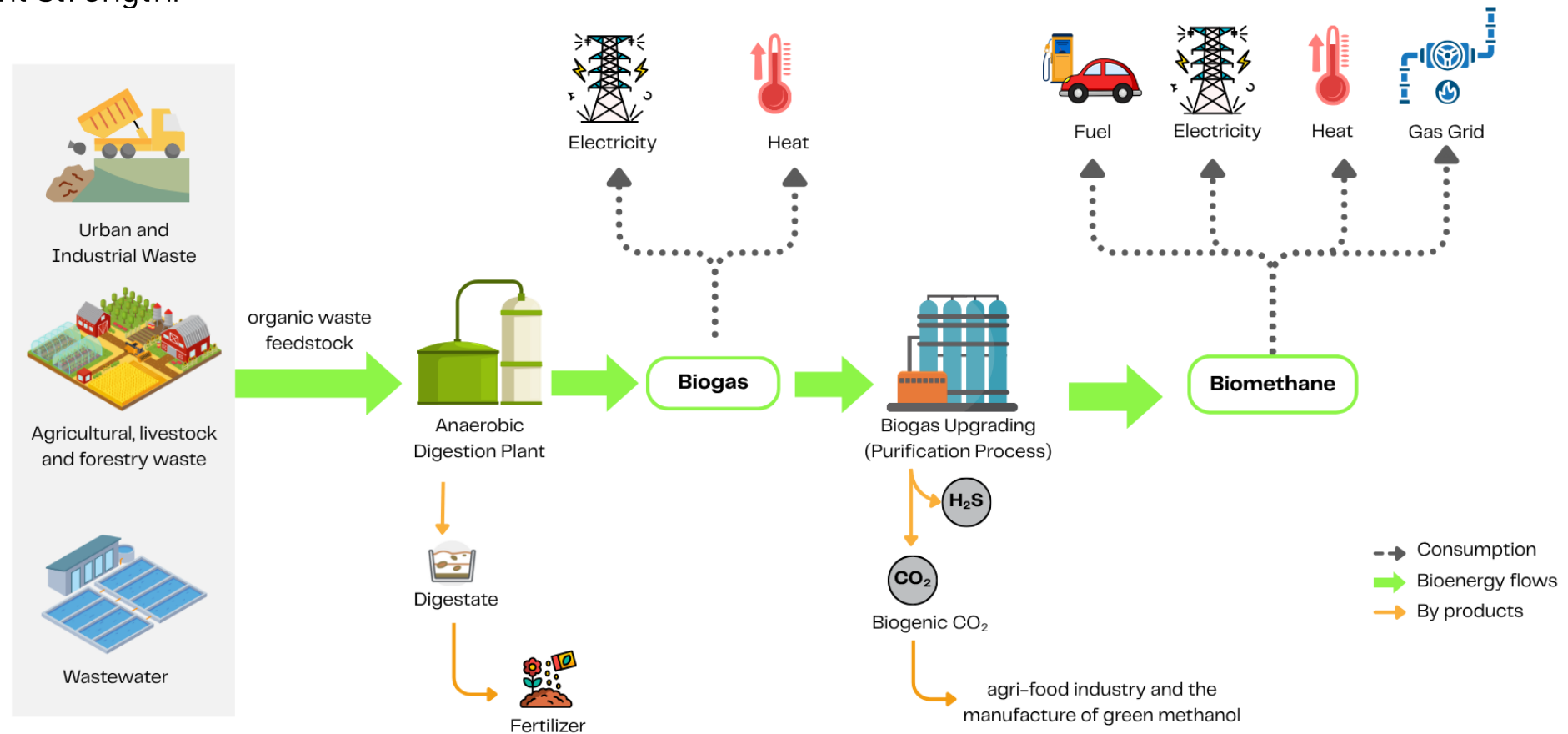
- Capacity of 200 MVar of 1 unit in 2027
- Capacity of 300 MVar of 2 unit in 2029
- Capacity of 300 MVar of 2 unit in 2030
- Capacity of 300 MVar of 2 unit in 2031



Biomethane Market and Opportunities in Thailand

What is Biomethane?

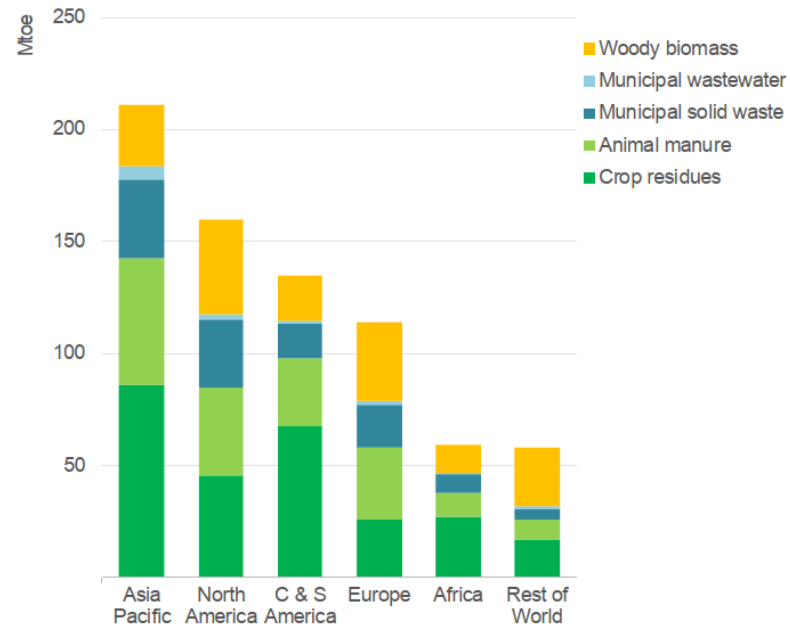
Biomethane is produced by upgrading biogas generated through the anaerobic digestion of organic materials such as livestock manure, agricultural residues, sewage sludge, and municipal waste to a quality comparable to natural gas. Its key advantage is its high compatibility with existing infrastructure, allowing it to be used as a “drop-in” substitute in pipelines, power generation, industry, and transport. This ease of integration, without requiring major new infrastructure investment, is a significant strength.



Biomethane Potential in ASEAN

Biomethane is emerging as a key business focus in Southeast Asia due to the wide range of available feedstocks. These include palm oil mill effluent (POME), livestock manure, agricultural residues, and municipal waste. The region has strong potential, as diverse organic waste streams from agriculture, food production, livestock, and urban activities can be converted into energy.

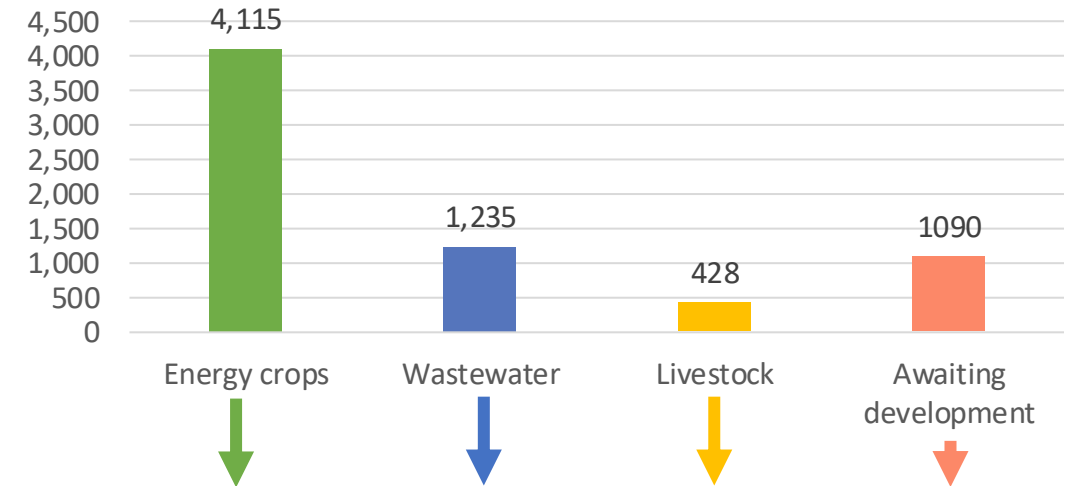
Possibilities to produce biogas and biomethane are widely distributed around the world



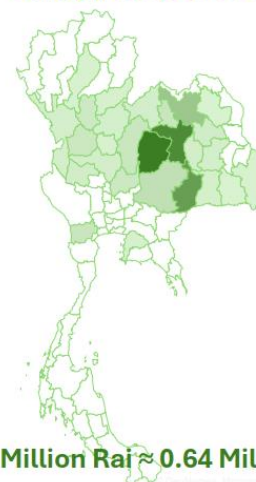
Notes: C&S America = Central and South America. Woody biomass feedstocks are available only for biomethane production.

Source: World Energy Outlook Special Report, IEA, 2020

Total biogas potential overview in TH (ktoe)



Energy Crops Potential Map



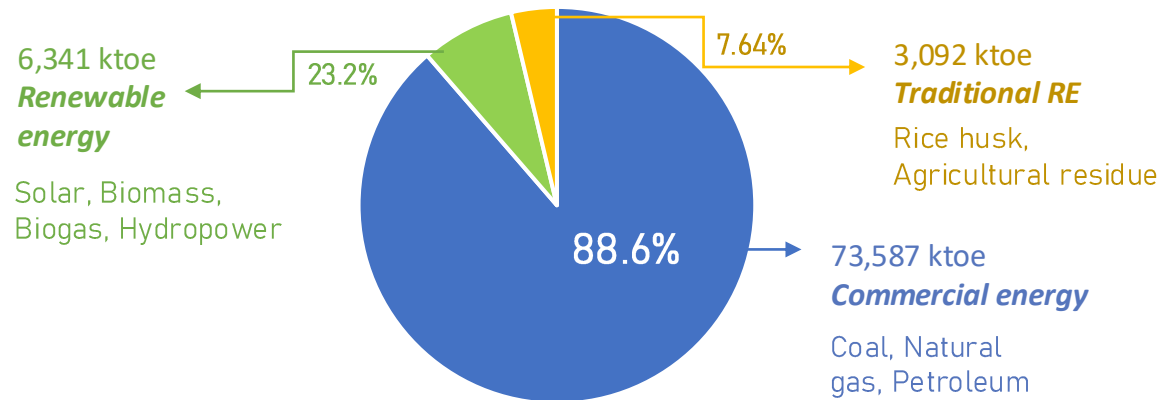
4 Million Rai ≈ 0.64 Million Hectares

26% Ethanol (molasses) 18% Cassava 15% Ethanol (cassava) 12% Palm	12% Rice product 8% Rubber 5% Chicken product 4% Animal feed (corn)	48% Meat farm 28% Swine farm 10% Milk farm 9% Egg farm 5% Broiler farm	591.86 ktoe Landfill 351.54 ktoe Additional ethanol 146.46 ktoe Organic food waste
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Biomethane Landscape in Thailand

As of 2024, Thailand's energy landscape remains overwhelmingly dependent on commercial energy sources, which account for 88.6% of the total Final Energy Consumption (FEC) of 83,020 ktoe. Petroleum products and electricity constitute the largest shares at 49.6% and 23.2%, respectively, while renewable energy currently represents a modest 7.64% of the total mix.

Final Energy Consumption in TH 2024



Renewable Energy Demand in Thailand

Heat > Electricity > Transport

Sector	RE source	Potential		Demand in 2037*	%RE	Reference
Electricity	Solar	24,308.81	31,139.82	24,951.00	125%	Draft AEDP2024
	Solar roof	425.39				Draft AEDP2024
	Floating Solar	1,414.92				Draft AEDP2024
	Wind	1,390.06				Draft AEDP2024
	Micro Hydro	39.64				Draft AEDP2024
	MSW	2,177.00				Draft AEDP2024
	Ind. Waste	1,384.00				Draft AEDP2024
Heat	Biomass	23,000.00	26,901.00	43,884.00	61%	AEDP2018
	Biogas	1,283.00				AEDP2018
	Biomethane	2,023.00				AEDP2018
	Waste	495.00				AEDP2018
	Solar PV	100.00				AEDP2018
Transport	Ethanol	1,379.00	4,134.00	24,182.00	17%	AEDP2018
	Biodiesel	2,579.00				AEDP2018
	Pyrolysis Oil	176.00				AEDP2018
RE ratio to Demand		62,174.82	93,017.00	67%	Just Do It !!	

* Estimate demand from Draft AEDP 2024

Source: Biogas Knowledge Exchange Forum 2026

Biomethane Landscape in Thailand

Thailand Policy Driver



Net Zero Target

Achieve net-zero greenhouse gas emissions by 2050

- Net greenhouse gas emissions of 152 MtCO₂eq (47% compared to 2019)



National Energy Targets

Draft AEDP 2024 (Alternative Energy Development Plan Year 2024–2037)

- Increase the share of renewable and alternative energy to 36% by 2037



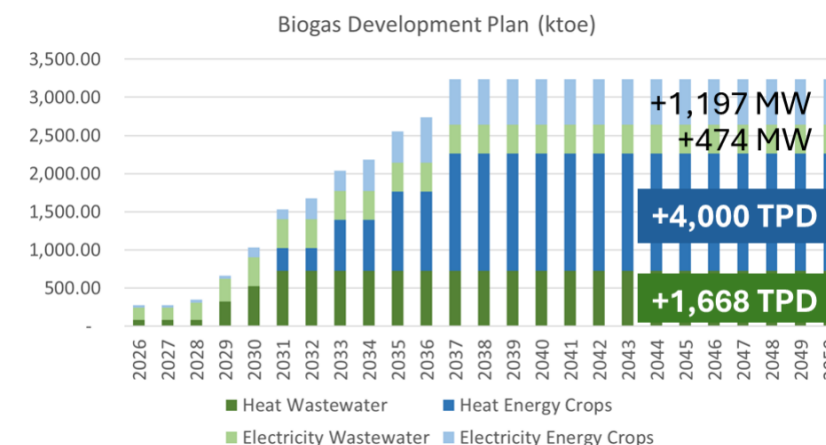
BCG Model

- Bioeconomy involves the production of renewable biological resources and the conversion of these resources into value-added products.

Heat and Electricity Sector Development Plan

- Promote biomass from fast-growing trees to ensure fuel supply and improve efficiency through higher-quality pelletized fuels
- Support biogas production from industrial waste, wastewater, and livestock farms, including the use of energy crops, to expand applications in electricity, heat, and biomethane

CO₂ emission reduction:
23.53
MtCO₂e/year
(6-7% of Thailand's emissions)



MtCO ₂ /year	Wastewater	Energy crops
CH ₄ capture	12.79	-
LNG replacement	1.16	3.32
Grid reduction	1.16	4.72

Source: Biogas Knowledge Exchange Forum 2026

Biomethane Market Mechanism

The biomethane market places strong emphasis on sustainability and traceability across the entire production supply chain, particularly in Europe and the United States, where transparency of origin and verifiable tracking are key requirements. As the biomethane sector scales up, certificates are critical for biomethane producers to rely on market-driven revenues instead of government support schemes and allow biomethane projects to be cost-competitive against conventional natural gas and other fossil fuels.

2 Main Market Systems

Book & Claim: Renewable attributes are traded separately from the physical gas through certificates

Mass Balance: Biomethane is physically mixed with conventional gas, and certified volumes are tracked through accounting records.

Biomethane certification schemes

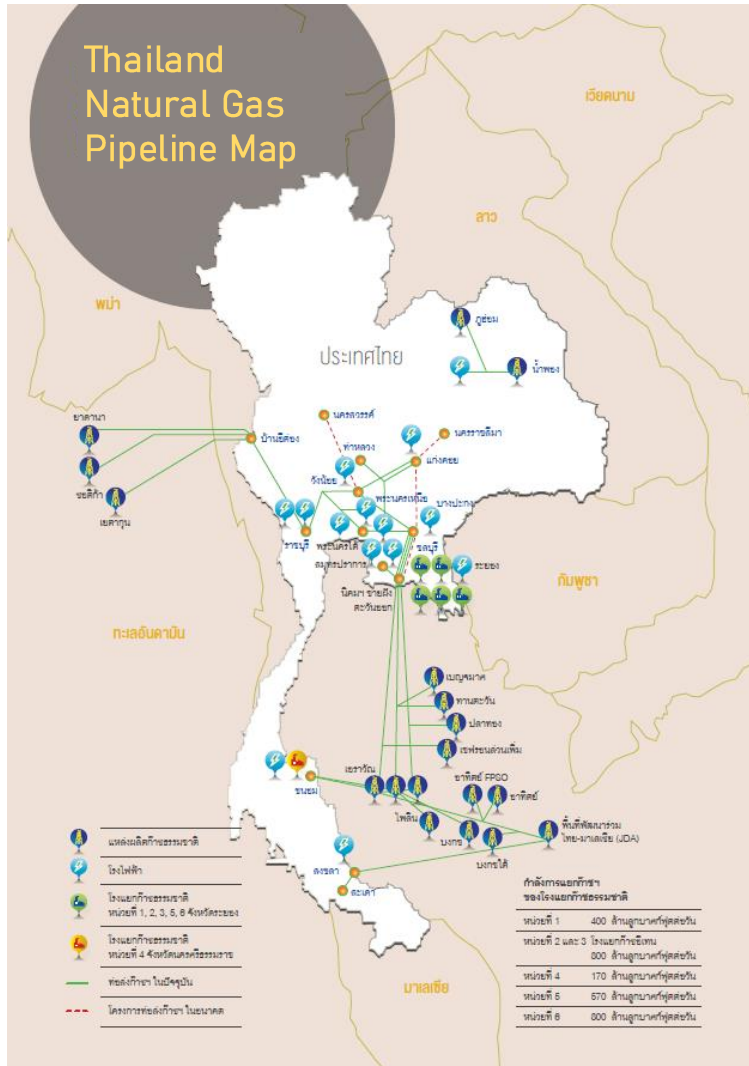
- ISCC (International Sustainability & Carbon Certification)
- RSB (Roundtable on Sustainable Biomaterials)
- 2BSvs (Biomass Biofuels Sustainability scheme)
- I-TRACK(G) (International Tracking Standard for Biogas and Biomethane)
- European Renewable Gas Registry (ERGaR)
- AIB (Association of Issuing Bodies)



ISCC Sustainability Certification and Traceability of Biomethane Supply Chains

ISCC is a voluntary certification body that enables transparent tracking of biomethane flows using recognized chain-of-custody models (e.g., mass balance), ensuring credibility, sustainability verification, and acceptance in international markets.

Biomethane Market Mechanism



Source: <https://pttgr.pttplc.com/Knowledge/Knowledge?ID=Pipeline>

Key Barriers

- **Policy shift:** Transportation sector, Thailand's energy policy has shifted from promoting CBG under AEDP 2015 to **prioritizing EVs** in the current AEDP 2018 and draft AEDP 2024
- **Infrastructure constraint:** Gas grid operated by PTT Public Company Limited with no multi-injection system
- **Lack of Market Demand:** Domestic demand for certified biomethane is still limited, reducing the incentive for project developers.

ISCC in Thailand

Certification for biomethane production in Thailand is currently voluntary and is mainly applied to CBG or LBM projects intended for export. This is driven by buyers who require traceability or by destination markets with compliance requirements.

Key Summary

1

Biomethane in Southeast Asia is driven by the region's abundant and diverse feedstock availability for production.

2

High-demand energy source for industrial heat applications in Thailand

3

Biomethane is primarily used as CBG or LBM, either for onsite use or transported by truck or ship due to no gas grid injection system.

4

Key Barriers to Biomethane Production and Utilization

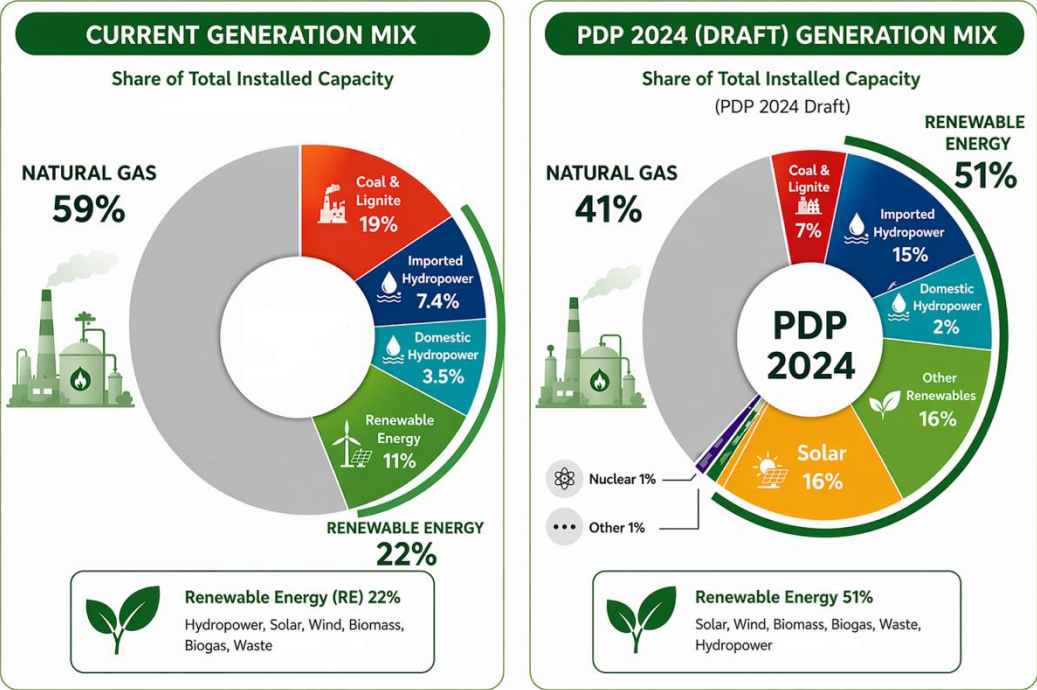
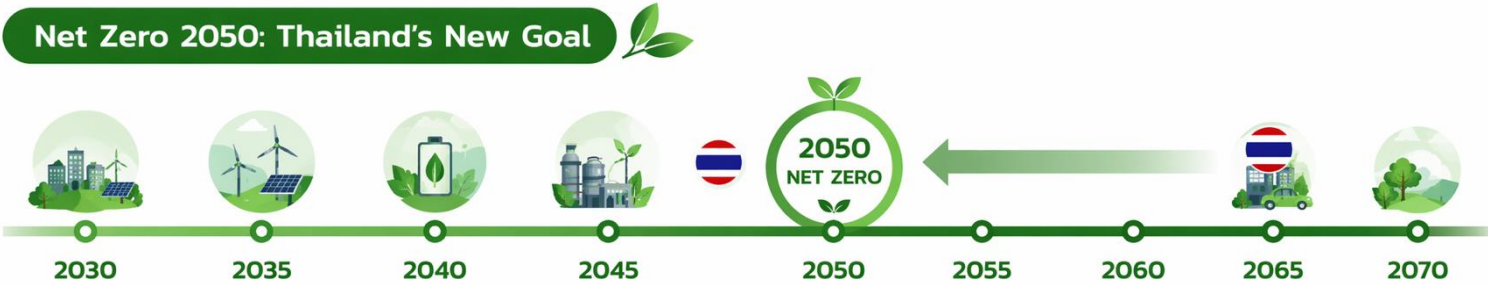
- High production and technology costs
- Gas pipeline networks are not fully accessible
- Lack of clear and unified regulatory frameworks and standards
- Small feedstock sources and geographically dispersed, making collection difficult

5

Biomethane certification and tracking systems enable efficient use of biomethane and decarbonisation efforts in compliance markets.

Thailand's Energy Transition Goal

Thailand Accelerates Net Zero Target to 2050



THANK YOU

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