August 2026

Institute for Energy Economics and Financial Analysis

Reforming Thailand's rooftop solar policy framework to reduce gas dependence

Pakistan's rapid solar expansion provides a roadmap for accelerating rooftop adoption in Thailand

Haneea Isaad, Energy Finance Specialist, Pakistan

Contents

Figures and tables

Key findings

Natural gas accounts for 66% of Thailand's electricity generation, but declining domestic production has increased reliance on volatile liquefied natural gas (LNG) imports. Rising fuel costs have strained the finances of the state utility Electricity Generating Authority of Thailand (EGAT), highlighting the economic risks of continued dependence on fossil fuels.

Thailand's ground-mounted solar growth has accelerated, but rooftop deployment remains limited despite abundant solar resources and decades of policy support. High installation costs, low buyback rates, restrictive quotas, and policy uncertainty continue to constrain consumer adoption.

Pakistan provides a replicable model for Thailand to unlock consumer-led solar growth. Since 2018, Pakistan has deployed 38GW of solar capacity by removing trade barriers, avoiding strict capacity caps, and offering a net metering mechanism with attractive buyback rates, which reduced payback periods to under two years.

Reforming Thailand's rooftop solar framework by shifting from net billing to net metering, implementing higher buyback rates, introducing tax incentives, and relaxing capacity limits could shorten payback periods for rooftop solar systems and help reduce reliance on expensive gas-fired generation.

Executive summary

Thailand generates 66% of its power from natural gas, reflecting the country's longstanding reliance on indigenous offshore gas reserves in the Gulf of Thailand. As domestic gas production declines, the country has become increasingly dependent on liquefied natural gas (LNG) imports, exposing the economy to global price volatility. Consequently, the state utility and buyer of last resort, Electricity Generating Authority of Thailand (EGAT), has had to bear significant subsidy costs. By March 2026, EGAT carried more than THB36 billion (USD1 billion) in losses from past energy crises, highlighting the fiscal risks of its continued reliance on fossil fuels.

Despite year-round solar irradiance and decades of policy support mechanisms, tariff premiums (adder tariffs), feed-in tariffs (FiTs), and energy buyback schemes, Thailand's solar capacity lags behind its peers. As of early 2026, the country had approximately 11.8 gigawatts (GW) of solar capacity. Utility-scale, ground-mounted installations accounted for 8GW, while rooftop solar constituted just 3.6GW.

Thailand's latest Power Development Plan (PDP) 2026 targets 60% renewable energy by 2050, with solar power playing a key role.[1] Since 2018, solar energy has led incremental renewable energy capacity additions, with ground-mounted deployment accelerating in 2024. However, rooftop solar adoption faces several barriers:

- **High capital costs:** Setting up a rooftop solar system in Thailand costs approximately USD936 per kilowatt (kW), nearly 50% higher than regional peers such as Pakistan, Malaysia, and Vietnam, due to higher dealer markups, limited service provision, and localized regulatory requirements.
- **Unfavorable incentives:** The current "Solar for Thai People" net billing scheme offers a buyback rate of THB2.2 (USD0.07) per kilowatt-hour (kWh), which is below retail electricity tariffs averaging around THB3.88/kWh (USD0.12/kWh). This results in extended payback periods between six and seven years for residential installations.
- **Restrictive quotas:** Tight capacity limits have historically hindered market expansion. For example, the 90-megawatt (MW) residential quota set in Thailand's 2019 net billing scheme was intended to run until 2030 but was fully utilized by 2024. While a new 2026 resolution expands the national cap to 500MW, a restrictive 5kW per meter export limit may be implemented, impacting project economics.
- **Policy uncertainty and delays:** Frequent changes to incentive schemes create uncertainty for consumers, while institutional implementation delays hinder technology rollout.

[1] Bangkok Post. Clean energy the focus of power plan. 26 June 2026.

Pakistan's recent solar boom provides a valuable case study. Since 2018, the country has deployed 38GW of solar capacity by removing trade barriers, avoiding strict capacity caps, implementing an attractive net metering framework that adjusts excess generation on a kWh-to-kWh basis, and offering generous dynamic buyback rates. These policies shortened the payback period for net-metered systems to less than two years, resulting in more than 350,000 connections by the end of 2025.

Recommendations for accelerating solar deployment in Thailand

The next few years will be crucial for sustaining Thailand's rooftop solar growth. High installation costs and changing policy targets undermine incentives to accelerate solar deployment. Thailand should consider adjusting its regulatory framework to improve project economics for end-users through the following measures:

- **Transitioning from net billing to net metering** would allow households to offset electricity consumption at retail rates, reducing payback periods to approximately four years.
- **Offering higher buyback rates** could lead to faster cost recovery for consumers and greater profitability once initial investments are recouped. For instance, a buyback rate of THB3/kWh, rather than THB2.2/kWh, could shorten the payback period to five years under the current net billing scheme.
- **Promoting tax rebates** by streamlining the recently introduced personal income tax deductions (up to THB200,000) and corporate tax deductions (up to 150%) would lower initial investment barriers.
- **Removing strict self-consumption thresholds and system capacity caps** to eliminate grid barriers and enable consumer-led clean energy markets to scale. This change would also allow daytime rooftop solar generation to displace expensive gas-fired generation during peak hours, reducing costs for both utilities and consumers.

Introduction

Thailand was one of the first Southeast Asian nations to encourage the adoption of solar energy. The country's renewable energy 'Adder' scheme, introduced in 2007, triggered renewable energy development and was followed by dedicated rooftop solar incentives in 2013–2015. While initial renewable energy deployment — driven primarily by utility-scale projects — outpaced regional peers, growth has stagnated since 2018.[2] In contrast, regional neighbors such as Vietnam accelerated clean energy expansion through policy reforms, increasing the share of renewable energy supply from negligible levels in 2018 to more than 20% by 2022. In Thailand, renewable energy deployment has been constrained by policies focused on small-scale self-consumption, limited revenue support, and restrictive operating periods.

However, a recent surge in capacity additions has put Thailand on track to meet the ambitious solar targets established in the latest draft Power Development Plan (PDP).[3] As the country increasingly relies on liquefied natural gas (LNG) imports to offset declining domestic gas production, accelerating solar deployment could reduce dependence on gas-fired generation while improving energy security.

Rapid solarization has enabled countries such as India, China, and Pakistan to meet rising electricity demand during gas disruptions.[4] Pakistan's solar boom set a regional record, with an estimated 38 gigawatts (GW) of solar installed between 2018 and 2025.[5] The country's experience demonstrates how rooftop solar adoption can overcome grid barriers, deliver energy independence to consumers, and reduce reliance on LNG imports. As a result, Pakistan was able to mitigate the impact of the 2026 Middle East crisis, which disrupted LNG supplies.[6]

Thailand's power sector presents a contrasting case. The country has Asia's highest dependence on natural gas for power generation, with gas accounting for 66% of the power mix.[7]

Thailand faces significant financial and regulatory barriers to large-scale adoption of solar photovoltaic (PV), particularly for rooftop installations. Meanwhile, the recent energy crisis is prompting regional peers, including the Philippines, to follow Pakistan's example. High electricity prices and falling installation costs have shortened rooftop solar payback periods, making the Philippines the largest solar importer in Asia. With 1,300 megawatts (MW) of installed rooftop

[2] Transition Zero. A new baseline for Thailand's rooftop solar deployment. 20 January 2026.
[3] The shelved draft PDP2024 aimed to deploy 36GW of solar by 2037 as part of the goal of achieving a target of meeting 51% of the electricity mix with renewables in the same year. Ember. Thailand's cost-optimal pathway to a sustainable economy; Chapter 1. 30 September 2025; Energy Policy and Planning Office (EPPO). Draft Power Development Plan 2024. 20 June 2024. Page 42.
[4] Carbon Brief. Analysis: Solar overtakes gas power in Asia for first time ever. 12 June 2026.
[5] Renewables First. Customer Owned Renewable Electrification (CORE) finance mapping. May 2026.
[6] IEEFA. Breaking Pakistan's LNG dependence cycle. 11 June 2026.
[7] IEEFA. Iran conflict exposes Thailand's LNG vulnerability. 01 April 2026.

capacity in early 2026, the 3,000MW of panels imported in March and April alone could support more new rooftop capacity than is currently deployed.[8]

This report reviews Thailand's plans to revise its energy mix in line with long-term national plans. It assesses the country's current gas-intensive energy mix and the associated economic risks, reviews the evolution of its renewable energy incentives, and evaluates why these policies have delivered limited success.

The current Middle East conflict, following the Russia-Ukraine war four years earlier, marks the second major fuel supply disruption in recent years. In response, Thailand has redirected its focus on renewable energy, particularly solar. However, the current policy framework should be reformed to achieve the intended goals.

Drawing on Pakistan's rapid solar expansion as a case study, this report examines the policies and market conditions that enabled the country to transform its energy mix and reduce exposure to global market volatility. It identifies gaps in Thailand's policy design and offers recommendations to accelerate the deployment of renewable energy.

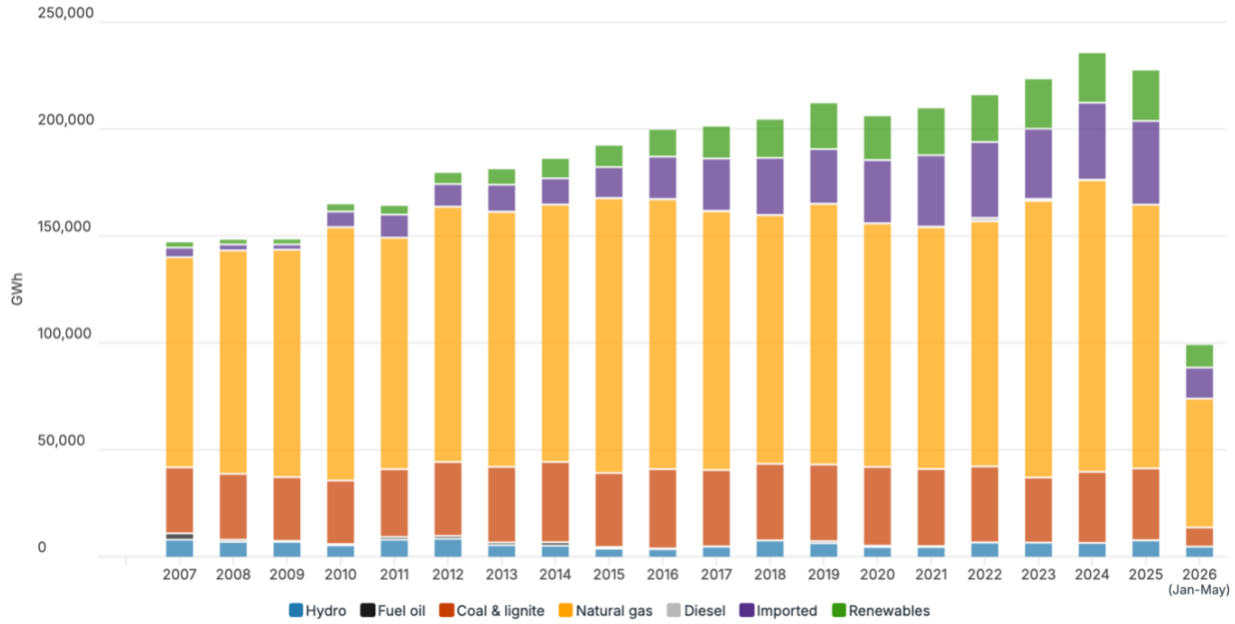
Evolution of Thailand's energy mix

Thailand's heavy reliance on natural gas stems from energy security policies adopted during the 1970s oil crisis. The discovery of offshore gas resources in the Gulf of Thailand enabled the country to replace imported oil with domestic gas, particularly for power generation.[9, 10] As a result, oil's share of primary energy demand fell from 88% in the early 1980s to 63% in 1994, while the share of natural gas increased from 2% to 21%.[11]

Natural gas has remained the dominant fuel in Thailand's power sector ever since, accounting for 65–70% of annual electricity generation between 2007 and 2015. Domestic production from offshore fields in the Gulf of Thailand, supplemented by pipeline imports from Myanmar, has historically met the majority of national gas demand.[12] Coal and lignite accounted for most of the remainder (approximately 20%).[13]

[8] Asian Business Review. Philippines overtakes Pakistan as China's No. 2 solar export market. June 2026.
[9] TDRI. Natural resource accounting: A case study of natural gas in Thailand. February 1996. Pages 2–3.
[10] Bloomberg. How an energy crisis could make Thailand richer.13 April 2026.
[11] TDRI. Natural resource accounting: A case study of natural gas in Thailand. February 1996. Page 9.
[12] Asia Natural Gas and Energy Association. Thailand. Last accessed on 14 July 2026.
[13] IEEFA's analysis based on power generation statistics from Energy Policy and Planning Office (EPPO) Thailand.

Figure 1: Thailand's power generation by fuel type, 2007–May 2026

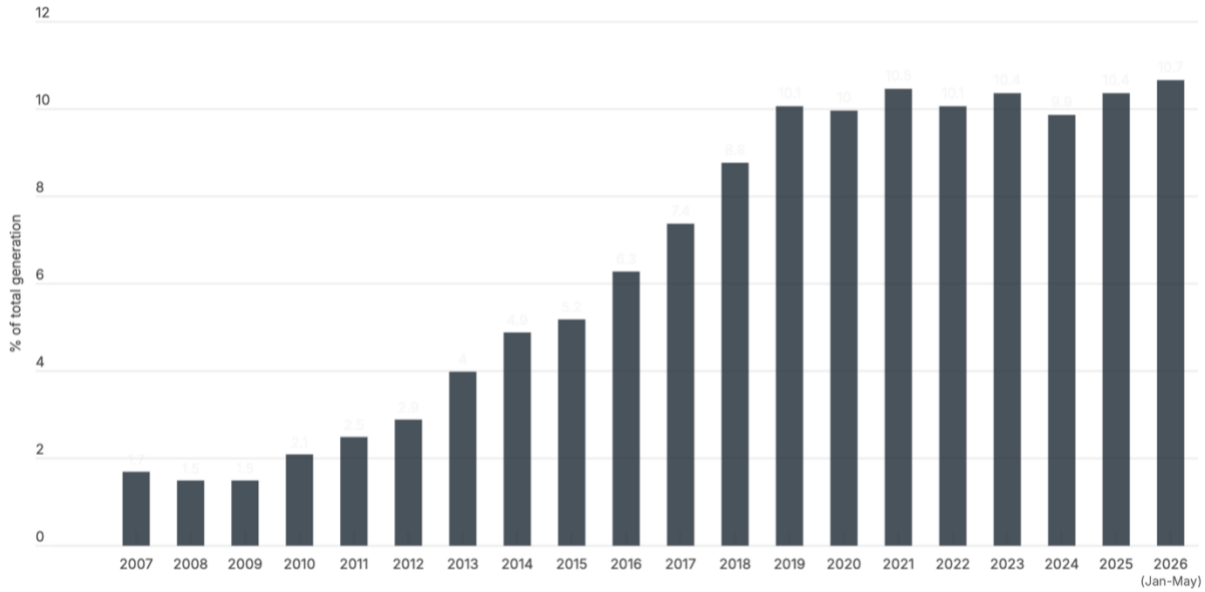


Source: Energy Policy and Planning Office (EPPO Thailand); IEEFA analysis.

However, declining production from these domestic gas resources has steadily increased Thailand's reliance on LNG, replacing one energy security risk with another. LNG imports began in 2011, rising from 16% of total gas supply in 2020 to 29% in 2024.[14, 15] Between January and May 2026, LNG imports accounted for an average of 40% of total gas consumption[16], increasing Thailand's exposure to volatile global gas markets.

[14] Asia Natural Gas and Energy Association. Thailand. Last accessed on 14 July 2026.
[15] Fangda Partners. Inside Thailand's renewables push: The 73GW opportunity, how to enter and what to watch. 4 June 2026.
[16] EPPO. Energy statistics - Table 3.1-1: Production and import of natural gas (current 2026).

Figure 2: Renewable energy as a percentage of total generation



Source: Energy Policy and Planning Office (EPPO Thailand); IEEFA analysis.

Thailand aims to reduce its dependence on fossil fuels by expanding renewable energy use. The Alternative Energy Development Plan (AEDP) 2015 targeted 30% of energy consumption from renewable energy by 2036.[17] Under the plan, solar and biomass capacity doubled renewables' share of electricity generation (including small-scale hydro) to around 11% between 2015 and 2025.[18] However, natural gas remains the dominant energy source, accounting for more than 65% of generation in 2025.[19]

Thailand's reliance on imported energy and associated economic risks

Thailand's gas-to-power sector is increasingly facing project delays, asset underutilization, and rising gas supply costs. In October 2025, the National Energy Policy Council (NEPC) suspended 4GW of gas-fired capacity and delayed the commissioning of another 0.6GW facility until 2029 due to excess electricity supply. In the same year, seven privately owned gas plants operated under a capacity factor of 10%. These plants have more than 11GW capacity, but have dispatched just 30% of their maximum output, costing the Electricity Generating Authority of Thailand (EGAT) — the country's vertically integrated utility managing electric power generation, transmission, and bulk sales — and

[17] Department of Renewable Energy Development and Energy Efficiency (DEDE). Alternative Energy Development Plan (AEDP 2015). September 2015.
[18] IEEFA's analysis based on power generation statistics from Energy Policy and Planning Office (EPPO) Thailand.
[19] EPPO. Energy statistics - Table 5.2-2: Power generation classified by fuel type (current 2026).

ratepayers THB159 billion (USD5.02 billion) since 2023. Despite this overcapacity, the government still aims to bring 6.3GW of new gas-fired capacity online by 2037.[20]

Thailand's structural overcapacity and continued prioritization of natural gas and LNG have hindered the transition to cleaner generation technologies and increased electricity generation costs. LNG imports expose the country to fuel price volatility and potential supply disruptions resulting from geopolitical tensions. As global prices fluctuate, the additional cost of securing supply has to be borne either by consumers or absorbed by electricity distribution utilities as losses.[21]

Thailand's gas-centered power strategy continues to strain EGAT's balance sheet. The government expects the utility to shield consumers from high LNG costs by absorbing fluctuations in fuel procurement expenses. EGAT does this by taking on debt[22] or seeking subsidy compensation from state-owned entities such as PTT.[23] The utility still carries more than THB31 billion (USD 0.93 billion) in debt from the impact of the 2022 Russia-Ukraine crisis.[24] As LNG prices increased, the fuel adjustment charge (Ft) — a component of electricity tariffs reflecting fuel costs — surged from a negative credit in 2021 to THB0.93 per kilowatt-hour (kWh) (USD0.028/kWh)[25], contributing to a peak subsidy burden of THB150 billion (USD4.5 billion) by the end of 2022.[26]

Although LNG procurement costs have eased since then, prices remain elevated. At the start of the 2026 Middle East conflict, Thailand's estimated cost of sourcing a spot LNG cargo rose by 125% in local currency terms.[27] Asian LNG prices fell from a peak of USD22.3 per million British thermal units (MMBtu) in March but surpassed USD21/MMBtu in July 2026 — double the USD10.5/MMBtu level before the closure of the Strait of Hormuz.[28] An expected 7.2% spike in summer power demand and geopolitical fuel price volatility is putting upward pressure on electricity prices, reducing consumer affordability.[29] With continued reliance on costly LNG[30], EGAT's subsidy burden is likely to increase. In April 2026, electricity tariff hikes resulting from rising fuel prices were capped at THB3.95/kWh (USD0.12/kWh) from May to August 2026. However, this 1.8% rise was offset by more than THB9 billion (USD271.7 million) in state subsidies.[31]

The impact on consumers could have been more pronounced as the Energy Regulatory Commission of Thailand (ERC) was considering implementing higher rates of THB4.08 and THB4.59 per kWh due

[20] IEEFA. Thailand's gas conundrum: Overbuilt, underutilized, and increasingly expensive. 26 February 2026.
[21] Bangkok Post. Power bills to rise only 1.8%. 01 April 2026.
[22] The Nation. Cabinet lets EGAT borrow THB85 billion to boost liquidity. 06 September 2022.
[23] Bangkok Post. PTT enlisted to help subsidize power bills. 10 October 2023.
[24] ERC. The Energy Regulatory Commission opens to listen to opinions on electricity bills for the period September–December 2026, offering 4 options, 3.95–4.73 baht per unit. 13 July 2026.
[25] Cap Solar. Thailand Ft history every period, 2020 → now (2026). 24 June 2026.
[26] IEEFA. Thailand's gas conundrum: Overbuilt, underutilized, and increasingly expensive. 26 February 2026.
[27] IEEFA. Iran conflict exposes Thailand's LNG vulnerability. 01 April 2026.
[28] IEEFA analysis based on JKM historical prices from Trading Economics. Last accessed on 14 July 2026.
[29] Bangkok Post. Regulator offers 3 power tariff rates. 26 March 2026.
[30] The share of LNG in the gas supply has reached almost 32% of in the first five months of 2026. IEEFA calculations based on EPPO statistics. EPPO. NGV statistics. Retrieved 21 July 2026.
[31] Bangkok Post. Power bills to rise only 1.8%. 01 April 2026.

to the LNG price spike. These increased prices would have ensured full repayment of the THB36 billion (USD1 billion) in outstanding costs borne by EGAT to subsidize power bills.[32]

Rising import bills pose significant risks to Thailand's economy, as oil and natural gas energy imports account for over 10% of its gross domestic product (GDP), the highest among the Association of Southeast Asian Nations (ASEAN). These vulnerabilities became evident during the recent Middle East crisis, as the country posted a current account deficit of almost THB500 billion (USD15 billion).[33]

Renewables gain policy attention, but expansion remains limited

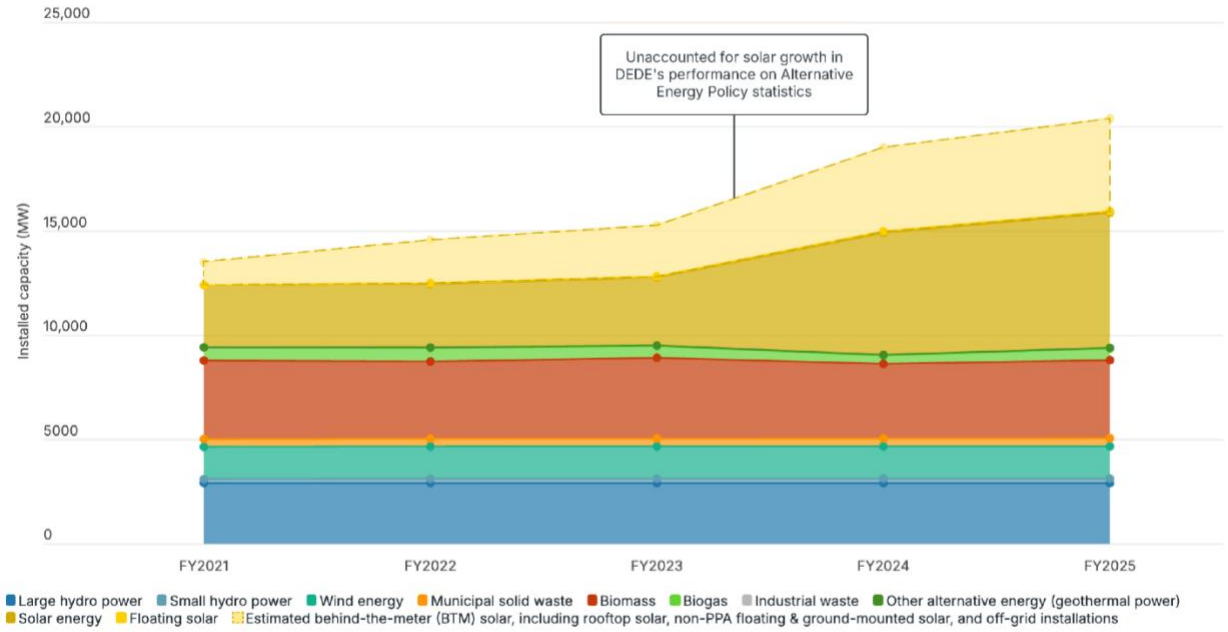
As the economic burden associated with rising gas prices becomes evident, the government of Thailand is reassessing the pace of its solar deployment. Since 2007, various programs have incentivized renewable energy growth, but frequent policy changes have led to uneven development, resulting in solar and wind additions trailing those of hydropower and bioenergy.

According to the Department of Alternative Energy Development and Efficiency (DEDE), Thailand's renewable energy installed capacity reached approximately 15,951MW by the end of fiscal year (FY) 2025. This comprised 3,132MW of hydropower, 1,544MW of wind energy, 4,693MW of bioenergy (biomass, biogas, and municipal solid waste), 34.3MW of industrial waste, 0.3MW of geothermal power, and 6,548MW of solar capacity (excluding behind-the-meter installations).[34]

While wind, bioenergy, and hydropower capacity growth has stagnated in recent years, solar energy has accounted for most new renewable energy capacity since 2018, with a sharp acceleration in behind-the-meter and ground-mounted deployment in 2024.[35] Furthermore, DEDE's Alternative Energy Policy excludes almost 4GW of non-power purchase agreement (PPA) ground-mounted and floating solar installations, behind-the-meter rooftop solar, and off-grid installations. As a result, the official figures understate the contribution of solar to recent renewable energy growth.

[32] Bangkok Post. Power bills to rise only 1.8%. 01 April 2026.
[33] The Nation. Ekniti says 500bn baht deficit shows need for energy shift and 5T model. 04 July 2026.
[34] DEDE. Performance on Alternative Energy Policy 2026. March 2026.
[35] Fangda Partners. Inside Thailand's renewables push: The 73GW opportunity, how to enter and what to watch. 04 June 2024.

Figure 3: Solar leads renewable energy additions in Thailand

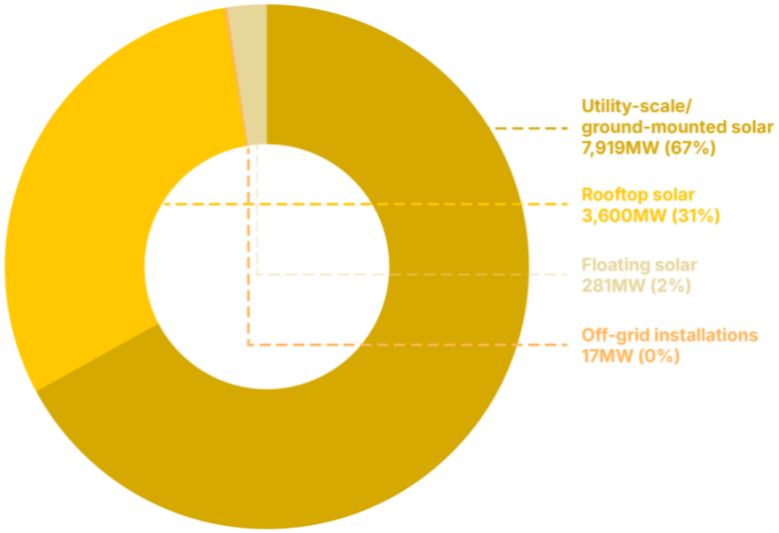


Source: IEEFA analysis based on the Department of Alternative Energy Development and Efficiency (DEDE)'s performance on Alternative Energy Policy statistics (October 2023–September 2024, March 2026).[36]

The Institute for Energy Economics and Financial Analysis (IEEFA) estimates Thailand's total solar PV capacity at around 11.8GW as of March 2026. Ground-mounted solar leads with almost 8GW of installations, while rooftop solar lags large-scale installations by an estimated 3.6GW cumulative capacity.

[36] DEDE. Performance on Alternative Energy Policy: October 2023–September 2024, March 2026.

Figure 4: Thailand's total solar PV capacity (2026)



Source: Oxford Business Group; International Energy Agency (IEA); PV Magazine; Energy Regulatory Commission (ERC); Department of Alternative Energy Development and Efficiency (DEDE); Ministry of Energy; CASE for Southeast Asia; Watson Farley & Williams; Transition Zero; IEEFA Analysis.

The draft AEDP 2024 targets 73GW of renewable energy capacity by 2037, comprising 63GW of domestic generation and 10GW of imported hydropower.[37] Solar accounts for 38,974MW[38] of this target, requiring annual additions of up to 2,720MW from a baseline of 11.8GW in March 2026.

Rooftop solar presents a near-term opportunity to achieve these targets while reducing Thailand's dependence on imported LNG and limiting the need for additional import terminals in the long term. This approach could benefit both the government and consumers while releasing fiscal resources for other energy objectives.

Recent plans place greater importance on rooftop solar in Thailand's clean energy transition. However, effective implementation and stronger project economics will be needed to achieve the required scale. Existing rooftop solar policies have been constrained by tight caps, a complex permitting process, frequent policy changes, and limited financial incentives.

The following section reviews Thailand's solar incentive schemes since 2007.

2007–2013: Introduction of the 'Adder' scheme

Thailand's three state-owned utilities — EGAT, Metropolitan Electricity Authority (MEA), and Provincial Electricity Authority (PEA) — encouraged solar PV adoption through the 'Adder' scheme, introduced in 2007. The program lasted six years, adding approximately 823MW of ground-mounted

[37] DEDE. Performance on Alternative Energy Policy: October 2023–September 2024, March 2026.
[38] International Energy Agency Photovoltaic Power Systems Programme (IEA-PVPS). Thailand 2025 country update.

solar capacity by 2013. It offered a tariff premium of USD0.26/kWh in addition to existing retail electricity rates for all solar installations, including residential rooftop systems.[39]

2013–2017: Transition from the 'Adder' scheme to a FiT framework

The 'Adder' scheme was discontinued in 2013 and replaced by a feed-in tariff (FiT) with varying rates based on the solar system's installed capacity. Residential rooftop solar PV systems of up to 10 kilowatts (kW) received the highest rate of USD0.21/kWh, while ground-mounted commercial and industrial (C&I) installations were offered a regressive tariff that declined over time.[40] Existing ground-mounted solar projects were allowed to convert to the new scheme at a flat FiT of THB5.66/kWh (USD0.17/kWh) for 25 years.[41]

Despite these schemes, solar uptake remained limited. By 2016, installed solar capacity had barely reached 3GW, with rooftop solar contributing only 135MW (see Appendix I for further details on capacity additions).

2017–2019: Policy shift toward self-consumption

Despite low adoption rates, the government shifted its focus to self-consumption. With a strict no-export rule, a 2017 policy allowed residential and C&I installations to install rooftop solar systems for on-site consumption. Excess power could be sent to the grid but would not be compensated financially.

2019–2022: A transition to net billing

In 2019, the self-consumption model shifted to a net billing scheme under the 'Solar for Thai People' program. While households could export surplus electricity to the grid at a buyback rate of THB1.68/kWh (USD0.0494/kWh), the policy prioritized self-consumption. The buyback rates remained below the average retail electricity tariff of about THB3.88/kWh (USD 0.12/kWh). As a result, by 2021, the net billing scheme registered only 4.3MW of installations against a national cap of 100MW, indicating that the buyback rate was not economically attractive for households.[42]

In 2021, the buyback rate was increased to THB2.2/kWh (USD0.07/kWh) to encourage household adoption. By 2023, Thailand's total rooftop solar adoption reached 3GW, but residential installations

[39] Tantisattayakul et.al. Adoption, fiscal cost, and policy compromise: Evaluating residential rooftop solar policies in Thailand. 26 March 2026.
[40] Tantisattayakul et.al. Adoption, fiscal cost, and policy compromise: Evaluating residential rooftop solar policies in Thailand. 26 March 2026.
[41] Fangda Partners. Inside Thailand's renewables push: The 73GW opportunity, how to enter and what to watch. 04 June 2024.
[42] Energy Regulatory Commission (ERC). Annual Report 2021.

under the net billing scheme accounted for just 75MW. Ground-mounted installations stalled, with only 160MW added between 2019 and 2022.[43]

2022–2025: Revival of the FiT scheme

The FiT scheme was revived in 2022 with a 5GW quota for biogas, wind, solar, and solar-plus-battery energy storage system (BESS) configurations, which continues to date.[44] The program renewed consumer interest in large-scale installations, leading to a 3.3GW increase in ground-mounted solar installations in 2024, driven by the C&I sector. [45] Policies by the ERC in 2024–2025 eased licensing and building-modification permit requirements supporting further rooftop solar development.[46]

Thailand’s ‘Quick Big Win' initiative, announced in October 2025, introduced several measures to support solar deployment. These included a 1,500MW community solar program, under which utilities could procure electricity from local producers at a FiT of up to THB2.25/kWh and distribute it to communities at lower rates[47]; a direct PPA pilot allowing Board of Investment (BOI)-promoted data centers to procure renewable energy directly from private developers through third-party grid access; an agricultural solar pumping program to deploy over 1,200 solar-powered water pumps, and a 1,600MW floating hydro-solar program to support hybrid renewable energy configurations.[48]

By the end of 2024, Thailand’s total installed solar capacity exceeded 9.9GW, with almost 3.5GW (mostly rooftop solar) dedicated to self-consumption. However, these systems lacked mechanisms to export excess electricity to the grid, limiting their contribution.

[43] ERC. Annual Report 2023.
[44] Watson Farley & Williams. Thailand’s 5GW renewable PPA FiT scheme: 2022–2030.12 October 2022.
[45] DEDE. Performance on Alternative Energy Policy 2026. March 2026.
[46] Dentons. Unlocking rooftop solar in Thailand: A new legal and incentive framework. 07 April 2026.
[47] Nagashima. Thailand legal update. November 2025.
[48] Swasdee Thailand. Thailand’s ‘Quick Big Win’ drives solar push to cut costs and boost income. 12 December 2025.

Table 1: Status of renewable energy power generation projects (September 2024)

Fuel	Renewable energy generation producers having committed to supply electricity to the grid		Power producers, using renewable energy as fuel, for one's own use and sale to direct customers	
	No. of projects	Contracted capacity (MW)	No. of projects	Installed capacity (MW)
Waste	**83**	**675**	-	-
Municipal solid waste	62	535	-	-
Industrial waste	21	140	-	-
Biomass	**282**	**2,401**	**48**	**1,016**
Biogas	**234**	**494**	**61**	**169**
Hydropower	**84**	**172**	**2**	**1**
Wind energy	**62**	**2,995**	-	-
Solar energy	**22,049**	**6,385**	**30,054**	**3,541**
Solar farm	666	5,686	276	226
Solar rooftop	6,149	131	29,719	3,103
Floating solar	2	70	59	211
Solar - government/agricultural coop (phases 1 and 2)	98	422	-	-
Solar PV rooftop - people sector	15,134	76	-	-
Other renewables	**5**	19	16	259
Total	**22,799**	**13,141**	**30,181**	**4,986**

Source: European Research Council (ERC) Annual Report 2024[49]; Electricity Generating Authority of Thailand (EGAT); Metropolitan Electricity Authority (MEA); Provincial Electricity Authority (PEA).

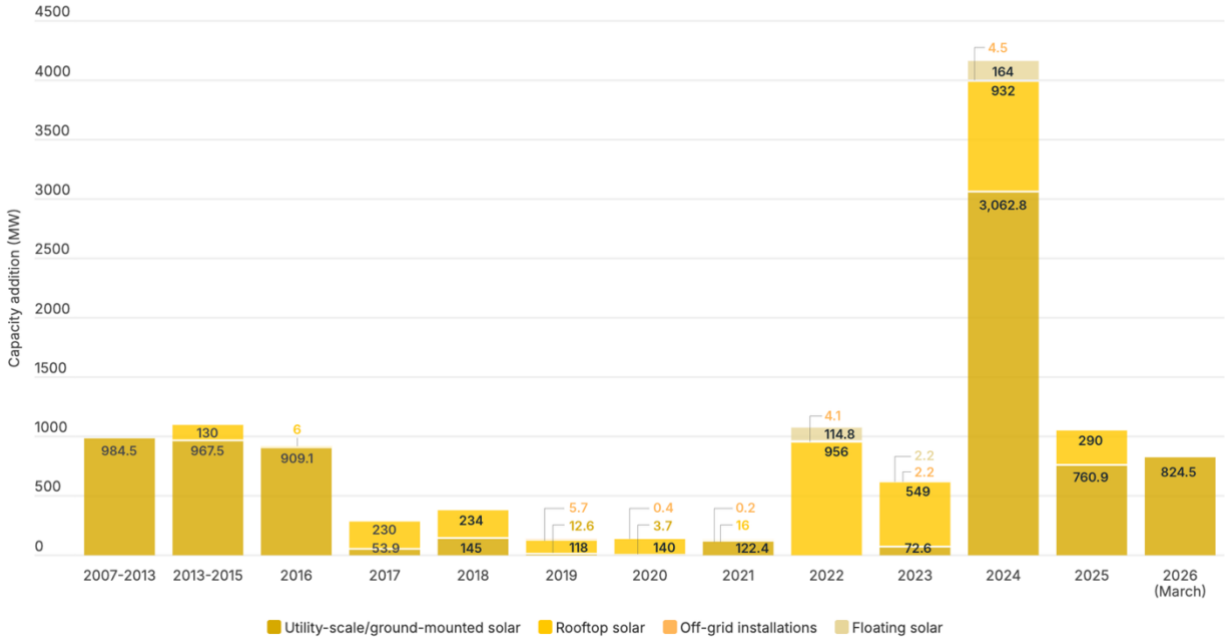
2026: Introduction of tax incentives and continuation of net billing

Officially announced in October 2025, but effective from March 2026, the government announced income tax deductions up to THB200,000 for residential rooftop installers and a corporate tax deduction of up to 150% for energy-saving equipment, including solar systems.[50]

Another ministerial regulation increased the existing residential net billing scheme's national cap from 90MW to 500MW.[51] While this quota is expected to remain in place until 2030, the uptake rate under the prior policy suggests that this limit could be reached in 2026.

[49] ERC. Annual Report 2024.
[50] ERC. Annual Report 2024.
[51] Lexcelsiam. NEPC Resolution 1/2569 (Meeting 176): Residential solar rooftop net billing — 2.20 THB/kWh, 500MW national cap, 5kW per meter limit, ERC Implementing Notification due June 2026. 3 May 2026.

Figure 5: Incremental solar PV capacity additions in Thailand, 2007–March 2026



Source: Oxford Business Group; International Energy Agency (IEA); PV Magazine, Energy Regulatory Commission (ERC); Department of Alternative Energy Development and Efficiency (DEDE); Ministry of Energy; CASE for Southeast Asia; Watson Farley & Williams; Transition Zero; IEEFA analysis.

Despite decades of policy support and year-round high solar irradiation[52], Thailand's solar PV capacity lags behind that of other regional countries. While ground-mounted installations have regained momentum and continue to attract strong interest, particularly as retail electricity tariffs rise, rooftop solar policies remain constrained by weak pricing signals and low installation quotas. These barriers have limited commercial viability and slowed initial adoption.

Policy uncertainty, restrictive caps, and delays have slowed rooftop solar adoption

Solar adoption in Thailand has been marked by fluctuating incentives through various schemes over the years (Figure 5). These changes were likely necessary to adapt to evolving market dynamics, technological advancements in solar equipment, and declining module prices. However, frequent policy changes have created uncertainty for consumers, affecting impact and delaying adoption.

In addition, capacity limits and restricted application registration timelines hinder access to incentives. Technology suppliers, installation service providers, and financiers are unclear about the potential market opportunity for investment and consumer interest in the rooftop market.

[52] Global Solar Atlas. Monthly average solar profiles for Bangkok Thailand.

The 2019 'Solar for Thai People' household scheme initially allocated a 100MW residential sector cap, divided between the MEA and the PEA. In 2021, the cap was reduced to 50MW, while an additional 50MW combined quota was extended to schools, academic institutions, hospitals, and agricultural water pumping companies.[53]

Interest in the scheme grew after buyback rates were increased. However, rather than relaxing the cap in proportion to the number of applications received, the government fixed the residential solar quota at 90MW, spread over nine years at 10MW annually until 2030.[54] The quota was fully subscribed by 2024, with energy export to the grid no longer supported, leaving self-consumption as the only option.[55]

The eligible system size for a net billing permit was also limited to 10kW per installation. In April 2026, the government passed a resolution to improve the "Solar for the Thai People" net billing program by increasing the subscription quota to 500MW per round, while maintaining the THB2.20/kWh buyback rate and the 10-year PPA tenor. This change could end the two-year pause on new applications but may introduce a 5kW per meter export limit.[56] Restricting surplus electricity exports could reduce the financial viability of rooftop solar installations and lengthen payback periods. The resolution is awaiting official notification by the ERC. Although originally expected by the end of June, the policy amendments may not come into effect until late 2026, as implementation delays are likely.

Operational constraints also continue to hinder rooftop solar deployment. Limited interconnection capacity and concerns about grid stability in areas with high solar penetration may lead metropolitan or provincial electrical utilities to decline new connection requests. These restrictions are compounded by competition between the 500MW residential quota and other renewable energy development schemes.

Similarly, while the 2022 FiT framework for ground-mounted solar installations allocates 2,368MW of target capacity, only a regulated quantity will be available for PPAs with state-owned utilities each year (Table 2).[57] Limiting the project size to 10MW for very small power producers (VSPPs) and 90MW for small power producers (SPPs) implies that just a few projects can fill the annual quota. Despite these policy initiatives, rooftop solar adoption remains modest, with only a few thousand installations in a country that has substantial untapped rooftop solar potential.

[53] Energy Regulatory Commission (ERC). Annual Report 2021. Page 24.
[54] ERC. Annual Report 2023.
[55] Zero Carbon Analytics. Thai households with rooftop solar already save on bills. Raising the net billing cap could mean they save 77% more than households without. 02 April 2026.
[56] Lexcelsiam. NEPC Resolution 1/2569 (Meeting 176): Residential solar rooftop net billing — 2.20 THB/kWh, 500MW national cap, 5kW per meter limit, ERC Implementing Notification due June 2026. 3 May 2026.
[57] Watson Farley & Williams. Thailand's 5GW renewable PPA FiT scheme: 2022–2030.12 October 2022.

Table 2: PPA purchase targets by renewable energy project category under Thailand's 2022–2030 5GW FiT framework

	2024	2025	2026	2027	2028	2029	2030
Biogas (wastewater/waste)			75	75	75	70	40
Ground-mounted solar + battery storage	100	100	100	100	200	200	200
Wind		250	250	250	250	250	250
Ground-mounted solar	190	290	258	440	490	310	390

Source: Watson Farley & Williams.

These low renewable quotas raise questions about whether new additions will meaningfully reduce energy prices. Historically, Thailand's electricity demand peaked during the daytime in the summer months (March–May). For instance, a peak of 33,177MW was recorded at 2:30PM on 28 April 2022. In recent years, however, rising nighttime electric vehicle (EV) charging and air conditioning loads have shifted peak demand to the evening. In 2026, a new peak demand of 36,759MW was reached at 8:50PM on 22 April.[58] Despite these changing loads, daytime electricity demand remains substantial. Even if the proposed 500MW solar program is fully achieved, it would represent less than 1.5% of the 2022 demand peak.

Regional comparison: Pakistan's solar expansion as a case study

Pakistan's rooftop solar revolution provides a case study for comparing the impact of consumer-led adoption on a country's energy transition. Since 2018, Pakistan has added up to 38GW of rooftop solar capacity, with 16.9GW in the residential sector. Behind-the-meter installations dominate (21.3GW), while 7.3GW feeds back to the national grid through net-metered connections. Off-grid installations, mainly in the agricultural sector (6.5GW) for pumping water, also amount to a significant 9.7GW.[59]

Pakistan's solar boom was driven by two factors: rising electricity prices during a period of severe grid instability that led to prolonged nationwide power outages, and a significant decline in the price of Chinese solar panels and related equipment, such as inverters and BESS. Grid-connected solar systems were encouraged through an attractive net metering scheme, tax exemptions, low-cost labor, and accessible after-sales operation and maintenance (O&M) (Table 3).

[58] EPPO. Electricity statistics dashboard (peak demand). Accessed on 19 July 2026.
[59] Renewables First. Customer Owned Renewable Electrification (CORE) finance mapping. 2026.

Table 3: Key drivers behind Pakistan's solar surge

Enabler	Description
Rising electricity tariffs, unreliable grid supply, and millions without grid access	Grid-based electricity was expensive and unreliable, reaching USD22¢/kWh in 2023. Tariffs increased by 155% between FY2022 and 2024 These factors were major drivers of solar demand
Improving economics and panel supply glut in China	Solar PV module prices in Pakistan fell to as low as PKR30 per watt (W) or USD0.11/W in 2024 (compared with a global average production cost of USD0.010/W in 2024)
	Short payback periods: Under two years for systems with net metering and three to four years for systems with net billing
Domestic financing	State Bank of Pakistan's concessional renewable energy financing scheme, providing financing at 6% Lease-based financing models offered by vendors
Policy-based factors	Discontinuation of gas supply and increased domestic gas tariffs for industrial consumers
	Net metering regulations, including dynamic buyback rates, generous system size limit, and seven-year generation licenses
	No cap on DISCO-level installations or overall installations volumes
No trade barriers	1. Ease of trade and tax exemptions on solar PV imports, including no import duties and reduced sales tax 2. Local traders entered the market to diversify portfolios amid import restrictions 3. Cross-border supply to Iran and Afghanistan
Availability of low-cost local installation and O&M expertise	Installation costs account for only 1/20th of total project costs for residential installations Minimal O&M costs

Source: IEEFA analysis; Bloomberg; Ember; Pricing estimates by local vendors.

Thailand receives higher year-round solar irradiation than Pakistan and is similarly reliant on imported fossil fuels for power generation, supported by significant capacity payments to legacy fossil fuel-based plants. However, differences in policy incentives and electricity tariff structures have resulted in different outcomes in renewable energy deployment.

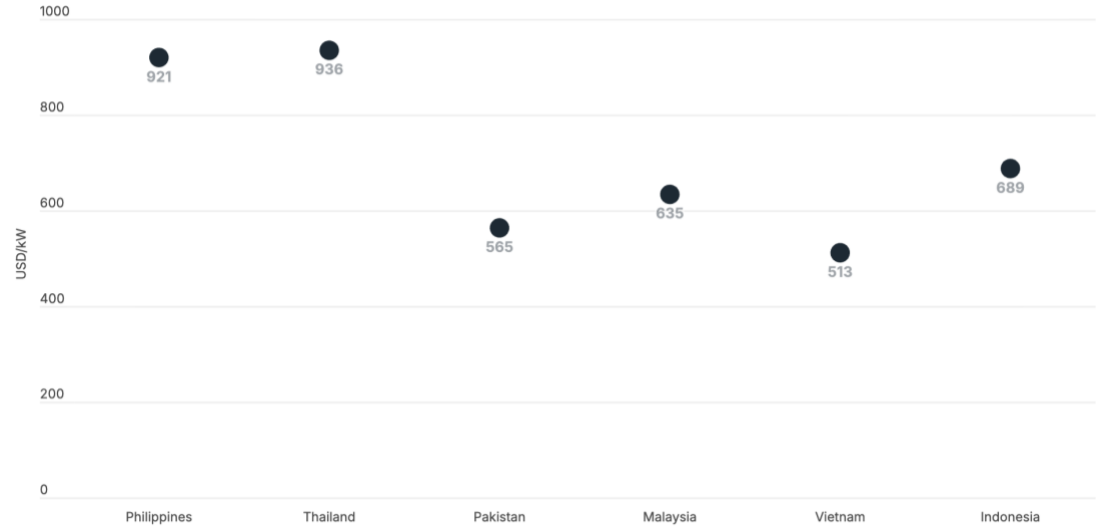
Thailand faces higher rooftop solar installation costs

As of 2024, Thailand had nearly 10GW of annual solar cell and module manufacturing capacity across 15 registered companies, along with seven inverter and three lithium-ion battery

manufacturers.[60] Although the country has focused mainly on final assembly[61], most production is exported to global markets.

Domestic output utilization in Thailand remains low at 10%.[62] Similar to other ASEAN countries and Pakistan, Thailand relies primarily on Chinese imports for solar cells, modules, inverters, and related electrical components. However, retail prices for Tier 1 solar modules vary significantly across markets.[63, 64] In Thailand, average prices are around USD0.37 per watt (W), more than double those in Pakistan (USD0.14–USD0.15/W).[65] This suggests substantial dealer markups and higher costs associated with stringent quality control and safety standards.[66] Consequently, Thailand’s costs for a 5kW grid-connected system are higher than in other countries, averaging around USD936/kW compared to USD500–USD600/kW.

Figure 6: Regional comparison of rooftop solar installation costs (2026)



Source: Market surveys (Pakistan); Green Energy Thailand[67]; Laka Solar (Philippines)[68]; Quanganhcons (Vietnam)[69]; Press (Malaysia)[70]; PT Roda Mas Abadi (Indonesia).[71]

[60] International Energy Agency Photovoltaic Power Systems Programme (IEA-PVPS). Thailand 2025 country update.
[61] World Bank Group. Country Climate and Development Report - Thailand. 2025.
[62] Dialogue Earth. Thailand’s solar sector faces hurdles in net zero push. 30 April 2025.
[63] The Progress Playbook. These countries imported the most Chinese solar panels in 2025. 21 January 2026.
[64] CGTN. Thailand's energy crisis: Soaring electricity prices spark a solar boom in Thailand, with Chinese technology driving an energy leapfrog. 11 May 2026.
[65] Green Energy Thailand. Solar panel installation costs in Thailand 2026: Complete price guide. 17 March 2026.
[66] Bangkok Post. The 2026 rooftop solar buyer’s guide: What Thai homeowners should look for. 29 December 2025.
[67] Green Energy Thailand. Solar panel installation costs in Thailand 2026: Complete price guide. 17 March 2026.
[68] Laka Solar. How much does solar panel installation cost in the Philippines? (2026 complete price guide). 17 July 2026.
[69] Quanganhcons. Solar energy costs in Vietnam 2025: Pricing framework and policy trends. 16 July 2025.
[70] Press. Solar ATAP 2026: What it is, benefits & costs for Malaysians. 25 December 2025.
[71] PT Roda Mas Abadi. Quote for 5–7.8kW rooftop solar installation. 11 February 2026.

Table 4: Cost comparison of a 5kW grid-connected rooftop solar system in Pakistan and Thailand

Cost input (USD)	5kW grid-connected residential rooftop installation				
	Pakistan	% of system costs	Thailand	% of system costs	% Difference Thailand vs Pakistan (cost)
Solar panels-monofacial (Longi)	714	25%	1,875	40%	163%
On-grid inverter	1,036	37%	1,094	23%	6%
Mounting structure and electrical components	613	22%	773	17%	26%
Installation and commissioning	107	4%	625	13%	483%
Permits and interconnection fees	357	13%	313	7%	-13%
Total system costs (USD)	**2,827**		**4,680**		**66%**
Cost per kW (USD)	**565**		**936**		**66%**

Source: Market survey; Green Energy Thailand; other media sources.[72]

Net billing versus net metering: Different policy incentives for rooftop solar adoption

Pakistan's progressive net metering policy, introduced in 2015 to address a 4,000MW power deficit, contributed about 20% of the country's rooftop solar expansion.[73] The policy allowed households, C&I enterprises, and agricultural users with an installation capacity of up to 1MW to sell surplus solar production back to the grid under attractive financial terms. A dynamic buyback rate was offered, benchmarked to the country's average power production cost. Consumers could offset daytime solar supply against off-peak nighttime consumption, which has a higher marginal cost.

The policy improved project economics by enabling surplus monthly generation to be carried forward to offset future consumption, eliminating interconnection fees, and allowing generous system limits of up to 1.5 times the sanctioned load. Without a capacity limit on registrations, adoption accelerated, reaching 354,852 registered net-metered connections by FY2025, which exported 3.14 terawatt-hours (TWh) of electricity to the national grid.[74]

These incentives, paired with lower solar module prices, delivered payback periods below two years for an average 10kW rooftop solar system.[75] A seven-year licensing period, renewable upon expiry,

[72] High Joule Group. How much does a 10kW solar system cost in Thailand? 21 April 2026.
[73] Alternative Energy Development Board (AEDB). Net metering reference guide for electricity consumer.
[74] NEPRA. State of the Industry Report 2025.
[75] IEEFA. Net metering reforms and grid challenges amid Pakistan's solar rise. April 2025.

also encouraged adoption by providing longer-term policy certainty, enabling consumers to continue generating positive returns.

Table 5: Net metering and net billing policy uptake trends in Thailand and Pakistan

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Thailand's residential rooftop net billing policy											
Registered connections with agreement	NA	NA	NA	121	480	789	3,220	8,789	16,342	Quota full	90MW cap relaxed as of 29 April 2026
Installed capacity (MW)	NA	NA	NA	0.69	2.61	4.3	17.64	48.1	89.5		
Pakistan's net metering policy											
Registered connections with agreement	2	106	350	1,167	4,918	13,700	36,362	75,724	157,844	354,852	456,812
Capacity (MW)	1	2	7	19	190	347	735	1,915	2,498	5,484	7,586

Source: Energy Regulatory Commission (ERC) Annual Reports 2019, 2021, 2022, 2023,2024[76]; Department of Alternative Energy Development and Efficiency (DEDE) PV Status Report 2020[77]; National Electric Power Regulatory Authority (NEPRA) State of the Industry Reports 2019, 2023, 2024 and 2025[78]; National Grid Company of Pakistan.

In contrast to Pakistan's single policy framework, Thailand has adopted different mechanisms for solar deployment across sectors. These include a rooftop solar net billing scheme for residential users, a FiT-based approach for ground-mounted installations, and a community solar power initiative capped at 1,500MW.[79] Buyback rates range between THB2.17–THB2.83/kWh[80], below Thailand's average retail tariff of THB3.88 per unit for the first four months of 2026.[81]

Table 5 highlights the exponential scale of policy adoption by consumers under Pakistan's net metering scheme. By comparison, Thailand's 90MW quota, fully subscribed by 2024, represents less than 1.2% of Pakistan's installed net-metered capacity and only 3.6% of its registered connections.

Rising fuel costs following the recent Middle East conflict led to Thailand revising the retail tariff to THB3.95 per unit, while the ERC proposed a tiered tariff system to offer relief to low-consumption consumers.[82] Pending review and approval by relevant authorities, under the progressive slab-based tariff system, small households consuming 1–200 units of electricity would be charged between THB2.34–THB3/kWh, while larger households using 201 units or more would face a higher rate of THB4.96–THB5.45/kWh.[83] An optional time of use (TOU) tariff also exists, offering a peak rate of THB5.11/kWh during peak hours (9:00AM to 10:00PM) and an off-peak rate of THB2.60/kWh

[76] ERC. Annual Reports.
[77] DEDE. Thailand PV status report 2020.
[78] NEPRA. State of the Industry Reports.
[79] Hunton. Thailand launches community solar power initiative. 11 November 2025,
[80] Watson Farley & Williams. Thailand's 5GW renewable PPA FiT scheme: 2022–2030.12 October 2022.
[81] Bangkok Post. Regulator offers 3 power tariff rates. 26 March 2026.
[82] Bangkok Post. Power tariff revamp, solar rooftop overhaul approved. 29 April 2026.
[83] Bangkok Post. New electricity rates put off until review. 18 June 2026.

(10:00PM to 9:00AM), with a flat service charge of THB312.24 per month.[84] This tariff is suitable for entities with high nighttime consumption or EV charging, where off-peak usage is most cost-effective.

Payback periods under Thailand's current net billing regime

Thailand's tariff design and buyback mechanism prioritize self-consumption, leading to higher savings and shorter payback periods for households and businesses that consume a larger share of their solar PV output. According to ERC, the largest increase in solar installations (3GW) was achieved in 2024 from large, utility-scale solar farms with PPAs with EGAT, MEA, or PEA.[85] Similarly, the C&I sector dominated rooftop installations, accounting for 2.2GW of the total 3.6GW as of January 2026.[86]

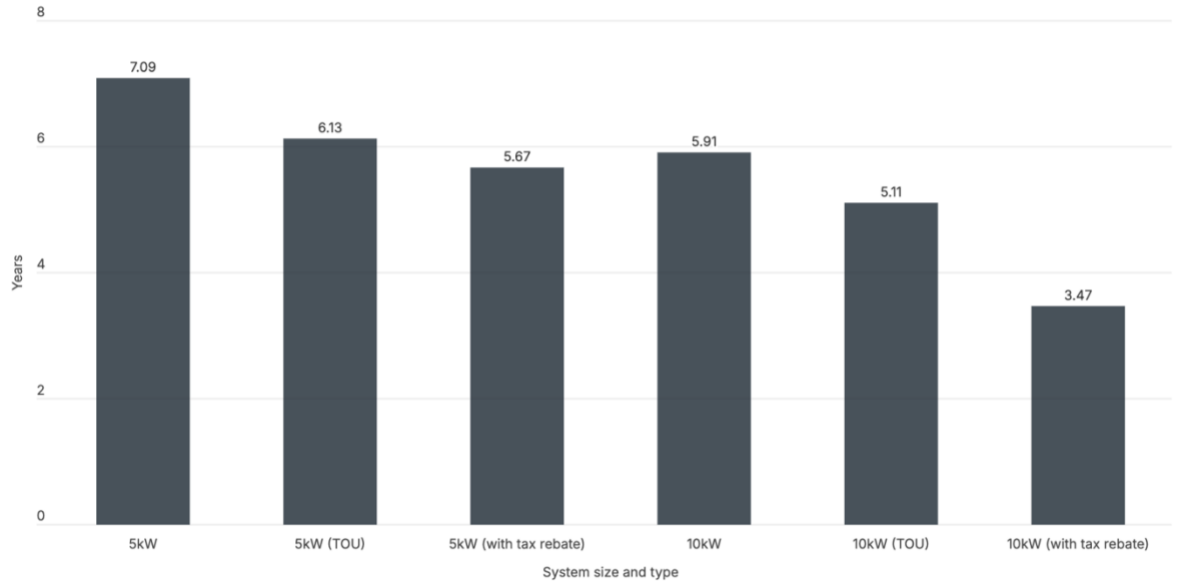
This trend is driven by the availability of a long-term FiT for larger C&I systems and by growing corporate demand for renewable energy to support decarbonization goals. Recent amendments to the Factory Act and building codes further encourage industrial and corporate adoption by exempting rooftop solar systems (even those above 1MW) from factory licenses and complex building modification permits, further easing access.[87]

In contrast, residential rooftop solar adoption has lagged due to limited revenue support mechanisms and low buyback rates, resulting in longer payback periods. IEEFA's analysis shows that under the current residential net billing scheme and designated buyback rates, an average 5kW rooftop installation costing around THB150,000 (USD4,490) has a payback period of just over seven years.[88] A 10kW residential rooftop system with a lower per kW cost reduces the payback period to 5.9 years.

For TOU-based rooftop solar systems, the peak/off-peak tariff design is structured to benefit households with higher daytime consumption. For a 5kW, TOU-based system, assuming 80% of solar output was consumed during the day, the payback period is estimated at 6.1 years. Similarly, 10kW systems benefit from improved project economics and may have payback periods as low as 5.1 years.

[84] Provincial Electricity Authority. Electricity Tariffs 2023.
[85] ERC. Annual Report 2024.
[86] Transition Zero. A new baseline for Thailand's rooftop solar deployment. 20 January 2026.
[87] Watson Farey & Williams. Unlocking solar potential: Thailand's regulatory shift on rooftop solar systems. 20 February 2025.
[88] Bangkok Post. The 2026 Rooftop Solar Buyer's Guide: What Thai homeowners should look for. 29 December 2025.

Figure 7: Payback period under Thailand's current net billing scheme at a buyback rate of THB2.2/kWh



Source: IEEFA analysis; residential consumption patterns observed from Gamonwet et. al[89]; solar PV system output obtained from the Global Solar Atlas[90].

Note: See Appendix II for details.

Key reforms to strengthen rooftop solar economics in Thailand

Despite a 10-year net billing period, residential rooftop solar installations remain only moderately attractive. Current payback periods, ranging between six and seven years, and a system size limit capped at 5–10kW weaken incentives for households to invest in rooftop solar systems.

Several financial reforms can be utilized to shorten payback periods for residential rooftop installations and improve project economics. These include capital subsidies that lower overall system costs; higher buyback rates under the current net billing scheme; and a transition to net metering that offers a kWh-to-kWh adjustment for every surplus unit exported to the grid. Higher electricity tariffs could also shorten payback periods by increasing household savings on energy bills.

[89] Gamonwet et.al. The assessment of the value of electricity saving and economic benefit to residential solar rooftop PV customer: The case of Thailand. November 2023.
[90] Global Solar Atlas. Bangkok average solar PV output monthly averages.

Enhancing financial viability through tax incentives

Thailand's latest tax incentive aims to reduce rooftop solar installation costs by providing an income tax deduction to eligible households and businesses. Approved by the government in November 2025, the incentive is available to residential consumers between 3 March 2026 and 31 December 2028. Eligible homeowners can deduct up to THB200,000 (USD6,000) from installation costs, depending on system size.

Based on IEEFA's capital cost assumptions[91], an income tax deduction of THB30,000–THB40,000 may be available for 5–10kW installations, reducing total system costs by 16–20%.[92] Under the current net billing mechanism, incorporating these potential tax benefits into system costs significantly shortens payback periods. For example, 5kW installations could break even in 5.7 years, while 10kW installations could achieve payback periods of 4.96 years.

However, the scheme has eligibility constraints. Tax deductions are limited to commercial operations and on-grid solar systems of up to 10kW. Taxpayers must also be registered owners of the Residential Type 1 electricity meter and provide full e-Tax invoices from VAT-registered suppliers.[93]

While IEEFA's analysis does not calculate payback periods for business or C&I installations due to modeling limitations, businesses can access a corporate tax deduction of up to 150% for certified energy-saving equipment, including solar systems, under the same scheme. This benefit cannot be combined with other incentives from the BOI or the Eastern Economic Corridor (EEC) framework.

Transitioning to a net metering scheme

Shifting from net billing to net metering has been under discussion in Thailand for several years.[94] Under a net metering scheme, consumers can use solar power directly, export surplus generation to the grid during the day and offset electricity consumption at night on a kWh-to-kWh basis at retail rates. Consumers pay only for their net consumption from the grid. Net metering may also allow surplus energy to be purchased at designated rates, which could be set at or below retail electricity tariffs.

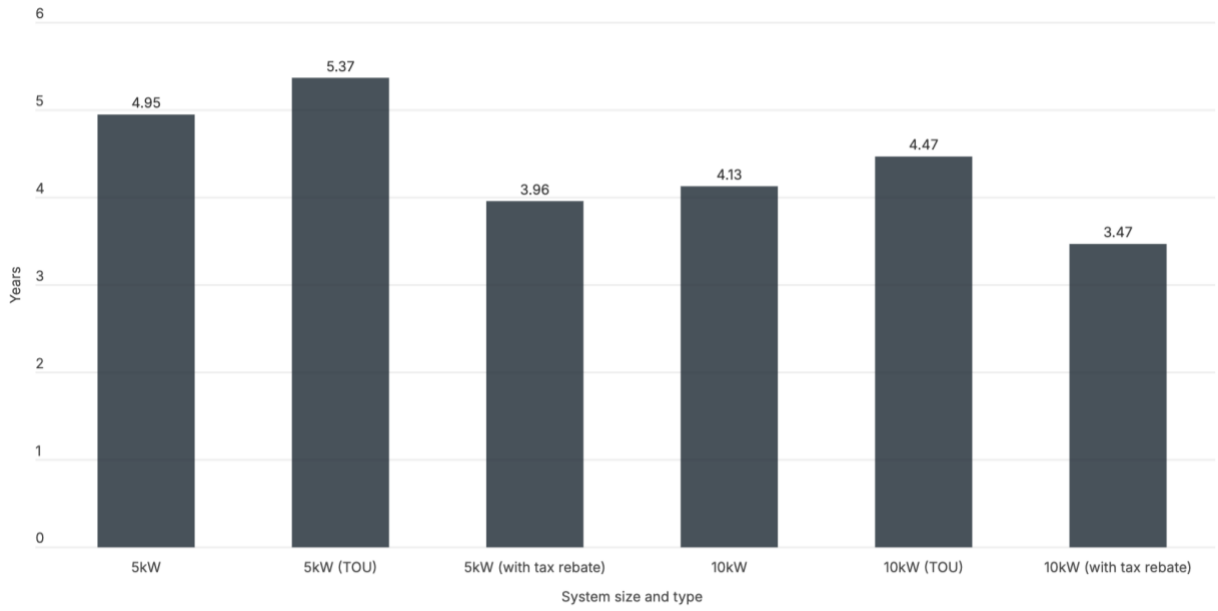
IEEFA estimates that optimally designed solar PV installations, where household consumption matches solar output, could eliminate electricity bills under a net metering scheme. This would significantly reduce payback periods compared with the current net billing mechanism. For instance, 5kW rooftop solar installations could break even in 4.95 years, while 10kW installations could reach payback in 4.13 years. Tax rebates could further shorten payback periods to 3.5–4 years for 5–10kW

[91] See Appendix II.
[92] Expat Tax Thailand. A win-win-win tax break: Pay less tax, cut your bills and support a greener Thailand. 05 March 2026.
[93] Dentons. Unlocking rooftop solar in Thailand: A new legal and incentive framework. 07 April 2026.
[94] Energy Tracker Asia, Thailand's rooftop solar boom and the energy crisis. 06 April 2026.

on-grid installations. For TOU-based systems, net metering would provide benefits only if surplus energy is sold to the grid at retail tariff rates.

The Thailand government could consider offsetting off-peak consumption only on a kWh-for-kWh basis, while charging for peak consumption, as seen in Pakistan. Under this approach, surplus energy sold to the grid is compensated at a rate below prevailing electricity tariffs. This would result in payback periods of approximately 5.5 years for 5kW residential rooftop installations and 4.5 years for 10kW systems.

Figure 8: Payback periods under a net metering scheme with kWh-for-kWh adjustment at retail tariffs



Source: IEEFA analysis.

Note: See Appendix II for details.

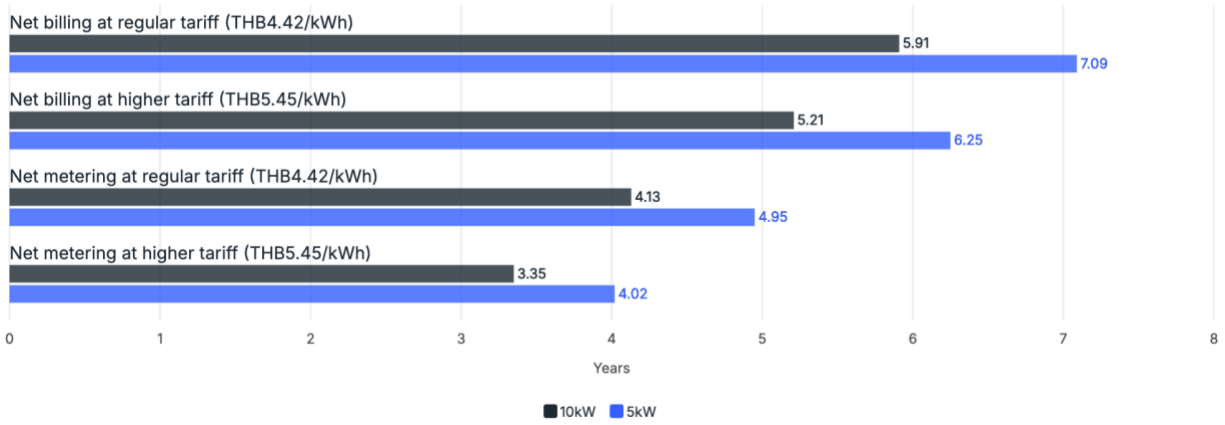
Shifting EGAT's subsidy burden onto consumers through higher retail electricity tariffs

EGAT's growing subsidy burden makes it increasingly challenging to manage rising gas costs. Even without the current energy crisis, Thailand's gas prices are expected to rise due to the overexpansion of gas-fired plants and declining domestic gas production, which has doubled LNG's share in the gas sector and increased reliance on fuel imports.[95] These costs may be passed on to consumers through higher electricity tariffs to maintain EGAT's financial stability.

[95] IEEFA. Thailand's gas conundrum: Overbuilt, underutilized, and increasingly expensive. 26 February 2026.

Higher tariffs improve the project economics of rooftop solar installations, allowing end users to reduce or eliminate their electricity bills. If ERC's tiered tariff structure is implemented, households consuming over 200 units could be charged THB5.45/kWh (or higher) to recover fuel costs and EGAT's past losses.[96] This would further shorten payback periods for rooftop solar systems and encourage adoption.

Figure 9: Payback periods under net metering and net billing schemes at higher retail electricity tariffs



Source: IEEFA analysis.

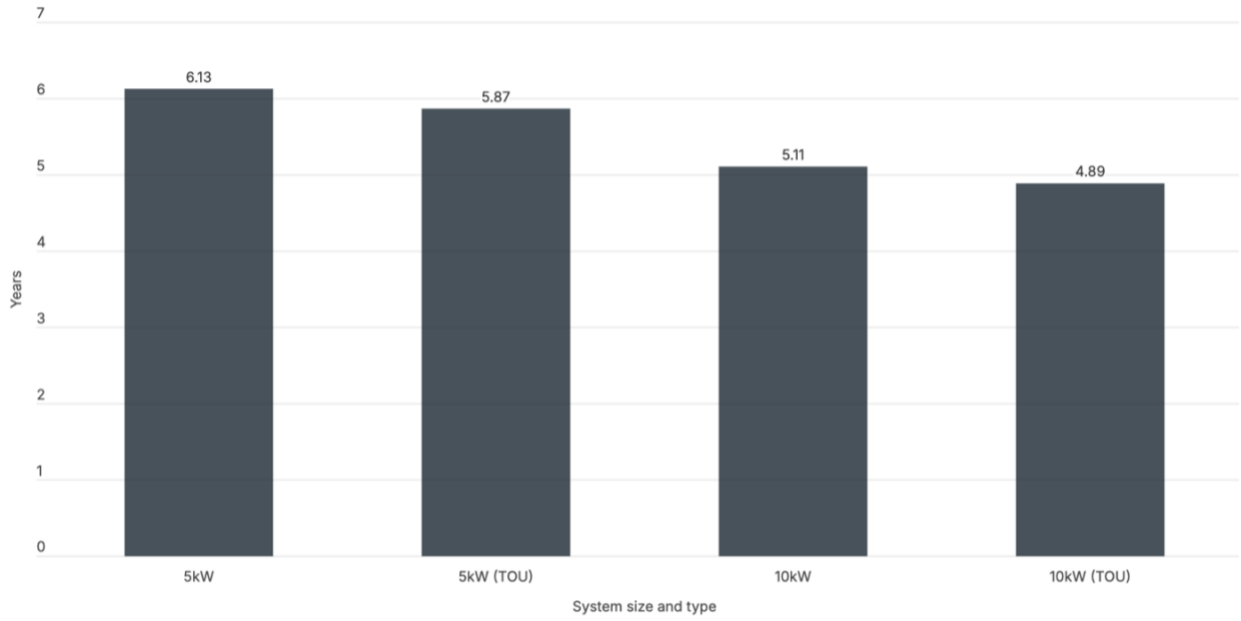
Note: See Appendix II for details.

Increasing rooftop solar buyback rates

Offering higher buyback rates would also improve project economics, resulting in quicker cost recovery for consumers and higher profitability once initial investments have been recouped. For instance, a buyback rate of THB3/kWh instead of THB2.2/kWh reduces payback periods to 5.1 years for 10kW installations and 6.1 years for 5kW installations under the current net billing mechanism.

[96] This tiered approach has been discussed but has not been implemented yet. The Nation. New power tariff may raise bills for homes using over 400 units from July. 22 May 2026.

Figure 10: Payback periods under a net billing scheme at a buyback rate of THB3/kWh



Source: IEEFA analysis.

Revising solar capacity limits to enable greater deployment

Higher buyback rates, coupled with relaxed solar capacity caps, could encourage meaningful growth in rooftop solar adoption, providing more consumers with the opportunity to take advantage of the improved financial viability. This would also align with Thailand’s long-term goals of lowering household electricity bills, meeting rising corporate demand for clean energy, and achieving the renewable targets under current and future PDPs. Restrictive quotas, such as the previous low caps under the rooftop solar net billing scheme, risk slowing clean energy deployment and prolonging reliance on fossil fuels. A more consumer-led power generation model would also support grid modernization by moving beyond the single-buyer model toward greater third-party access and scalable clean energy markets.

In the short term, faster additions of renewable energy could lower Thailand’s growing fuel import costs and ease pressure on EGAT’s finances by reducing dependence on expensive imported natural gas and volatile global fossil fuel markets.

Daytime solar output can help lower daytime peak demand, displacing expensive natural gas-based generation. Expanding support for solar-plus-BESS projects under the 2022 FiT scheme or introducing a standalone storage program could also help manage evening peak demand. [97]

Conclusion

The 2026–2028 period presents a strategic opportunity to accelerate Thailand's rooftop solar growth. The country should address longstanding barriers that have constrained rooftop solar deployment, including shifting policy targets, evolving incentive structures, and persistently high solar PV installation costs. This report demonstrates that capital subsidies, tax rebates, and higher buyback rates can improve the economic viability of rooftop solar installations. However, restrictions on program eligibility, deployment limits, and the time-bound nature of incentives risk limiting investment in rooftop solar systems.

At the same time, rising costs from underutilized gas and LNG infrastructure are likely to continue to strain the finances of state-owned utilities unless the government prioritizes debt recovery rather than shielding consumers from higher electricity prices. Accelerating rooftop solar deployment could reduce exposure to imported fuel expenses, ease pressure on utilities, and mitigate the impact of rising electricity costs on consumers as declining module prices and shorter installation timelines continue to improve project economics.

Pakistan's experience demonstrates that rapid rooftop solar adoption can be achieved through streamlined regulations, supportive policies, and a mature solar industry that lowers procurement and installation costs. Removing regulatory and financial barriers in Thailand could similarly boost the scale of rooftop solar adoption, support the growth of a domestic solar installation and service industry, reduce electricity costs, and provide consumers with greater energy independence.

[97] For example, one analysis suggests that replacing 1GW of gas-fired capacity with solar and battery could reduce LNG import requirements by as much as 1.6Mtpa. At current prices, IEEFA estimates that this could translate into savings of approximately USD145 million per month. Fangda Partners. Inside Thailand's Renewables Push: The 73 GW Opportunity, How to Enter and What to Watch. 04 June 2026.

Appendix I: Thailand's solar adoption under varying incentives (2007–2026)

Year	Total capacity (MW)	Incentivizing scheme	Target group	Features of the scheme
2007–2013	984.5 (utility-scale/ground-mounted solar)	Adder tariff scheme	Very Small Power Producers (VSPPs, <10MW) and Small Power Producers (SPPs, 10-90MW) operating biomass, biogas, wind, hydro, and solar plants	1. The "Adder" tariffs provided suppliers with additional per kWh compensation above retail tariffs for wholesale power producers. For solar, the adder rate was the highest, starting at THB0.262 per kWh. 2. VSPPs and SPPs could sell power to MEA, PEA, or EGAT through a PPA for 7–10 years. 3. Maximum facility size capped at 90MW.
2013–2015	1952.0 (utility-scale/ground-mounted solar) + 130 (rooftop solar) Total = 2,082MW	Feed-in tariff scheme (FiT)	Residential, commercial, and industrial VSPP and SPPs	1. **Solar rooftop program:** A 200MW quota targeting small-scale residential and commercial rooftop solar systems below 10 kilowatt-peak (kWp) 2. **Community ground-mounted solar:** An 800MW quota targeting systems of up to 1MW per village 3. **FiT period:** 25 years from scheduled commercial operation date (SCOD) 4. **Rooftop solar tariff rates:** • THB6.85/kWh for residential facilities (up to 10kWp) • THB6.40/kWh for small factories and businesses (10–250kWp) • THB6.01/kWh for medium and large factories (250–1,000kWp) 5. **Ground-mounted solar tariff rates:** • Regressive tariff structure: ○ THB9.75/kWh for years 1–3 ○ THB6.50/kWh for years 4–10 ○ THB4.50/kWh for years 11–25 • To qualify, community systems had to be installed by December 2014. A 200MW PPA quota was introduced, allocating 100MW to commercial rooftop solar systems (10–1000kW) and another 100MW to residential rooftop solar systems (0–10kW).
2016	2,861.1 (utility-scale/ground-mounted) 135.63 (rooftop solar) Total = 2,996.73MW			

2017	2,915 (utility-scale/ground-mounted solar) 365.17 (rooftop solar) Total = 3,280.17MW	Self-consumption only policy for rooftop solar (pilot) EGAT announces 2.7GW floating solar for hydroelectric dams in Thailand via PDP2018	Residential, commercial, and industrial	1. **No grid compensation:** Any excess solar power not immediately consumed by the property could be exported to the grid, but without any financial compensation. 2. **Strict permitting:** Due to the zero-export rule, systems had to be equipped with reverse-power relays or specific smart inverters to prevent electricity from flowing back into the grid, requiring technical approval from local utilities.
2018	3,060.2 (utility-scale/ground-mounted solar) 599.43 (rooftop solar) Total = 3,659.43MW			
2019	3,072.8 (utility-scale/ground-mounted solar) 717.32 (rooftop solar) 5.73 (off-grid installations) Total = 3,795.65MW	The 'Solar for Thai People' net billing scheme	Residential consumers <= 10kW	1. **Buyback rate:** THB1.68/kWh for residential consumers 2. **Export capacity:** Only installations up to 10 kW could export to grid 3. **FiT period:** 10 years 4. **Capacity target:** 50MWp of installed solar PV capacity 5. **Grid connection fee:** THB8,500
2020	3,076.5 (utility-scale/ground-mounted solar) 857.26 (rooftop solar) 6.11 (off-grid installations) Total = 3,939.67MW			
2021	3,198.7 (utility-scale/ground-mounted solar) 873 (rooftop solar) 6.33 (off-grid installations) Total = 4,078MW	The 'Solar for Thai People' net billing scheme	Residential, commercial and industrial (10–200kW)	The National Energy Policy Council (NEPC) extended the net billing scheme to academic institutes, hospitals, and agricultural water pumping systems in 2021. 1. **Buyback rate:** Excess solar PV energy output purchased at: • THB1/kWh for non-residential installations • THB2.2/kWh for residential installations 2. **Capacity target:** 50MWp of solar PV capacity • 20MWp for hospitals • 20MWp for academic institutions • 10MWp for agricultural water pumping systems 3. **FiT period:** 10 years 4. **Grid connection fee:** Reduced to THB2,000

2022	3,198.7 (utility-scale/ground-mounted solar) 1,829 (rooftop solar) 10.385 (off-grid installations) 114.8 (floating solar) Total = 5,152.9MW	5GW renewable PPA FiT scheme: 2022–2030	Biomass, ground-mounted solar, ground-mounted solar + BESS applications and wind	1. **Total project capacity:** PPAs for up to 5,203MW were allocated across: • Biogas: 335MW • Ground-mounted solar: 2,368MW • Ground-mounted solar + BESS: 1,000MW • Wind: 1,500MW 2. **Project size:** • VSPPs up to 10MW • SPPs above 10MW but not exceeding 90MW were eligible to participate 3. **FiT rates:** • Ground-mounted solar: THB2.17/kWh • Ground-mounted solar + BESS: THB2.83/kWh 4. **Contract period:** 25 years
2023	3,271.24 (utility-scale/ground-mounted solar) 2,378 (rooftop solar) 12.535 (off-grid installations) 117 (floating solar) Total = 5,778.8MW	The Solar for Thai People' net billing scheme		In response to growing residential interest and the grid's inability to absorb large volumes of rooftop solar, the Committee on Energy Policy Administration (CEPA), at its meeting on 8 February 2023, approved a resolution requiring distribution utilities to establish a cumulative purchase target of 90MW for 2021–2030.
2024	6,334 (utility-scale/ground-mounted solar) 3,310 (rooftop solar) 17 (off-grid installations) 281 (floating solar) Total = 9,942MW	Regulations eased for solar rooftop installations		1. A Ministerial Regulation removed the requirement for a factory license (commonly known as Ror. Ngor. 4) from the ERC or Department of Industrial Works (DIW) for all solar rooftop installations outside industrial estates, regardless of production capacity. Previously, this requirement applied to installations above 1,000kW. 2. Rooftop solar installations on residential, commercial, and industrial buildings weighing up to 20kg/m2 were exempted from being classified as building modification, eliminating the need for building modification permits or structural integrity assessments. 3. ERC simplified power generation registration procedures. Systems with capacities up to 10kVA were exempt from licensing requirements, and applications could be submitted online. 4. Grid connection procedures were simplified through online applications and removal of grid connection permit requirements for connections to PEA or MEA networks.

2025	7,094.87 (utility-scale/ground-mounted solar) 3,600 (rooftop solar) 17 (off-grid installations) 281 (floating solar) Total = 10,992.87MW	'Quick Big Win' initiative		The 'Quick Big Win' initiative, announced in October 2025, included: 1. **Community solar program:** A 1,500MW program where utilities procure electricity from local producers and distribute it to communities at reduced rates. The program targets more than THB30 billion in investment and THB3 billion in annual local revenue. 2. **Direct PPA pilot:** Allows BOI-promoted data centers to procure renewable energy directly from private developers through third-party grid access. 3. **Agricultural solar pumping:** Deployment of more than 1,200 solar-powered water pump systems across 700,000 rai of farmland, saving farmers up to THB15,000 per household annually.
2026 (March)	7,919.75 (utility-scale/ground-mounted solar) 3,600 (rooftop solar) 17 (off-grid installations) 281 (floating solar) Total = 11,817.75MW	1. Personal income tax incentive 2. Corporate tax deductions allowed 3. Revision of net billing caps		1. A personal income tax incentive was introduced under Royal Decree No. 805, effective from 3 March 2026 to 31 December 2028. Homeowners may deduct up to THB200,000 in qualifying rooftop solar installations costs. 2. Businesses may claim a corporate tax deduction of up to 150% for investments in certified energy-saving equipment, including solar systems. 3. The NEPC at Meeting 176 on 29 April 2026 approved Resolution 1/2569 launching the Citizen Solar Rooftop net billing program. Key features include: • National buyback cap: 500MW • Maximum export capacity: 5kW per residential meter • Fixed buyback rate: THB2.20/kWh • PPA duration: 10 years with distribution utilities (MEA in Bangkok metropolitan areas and PEA in the rest of the country)

Source: Energy Regulatory Commission of Thailand (ERC) Annual Report 2022, 2023,2024; Department of Alternative Energy Development and Efficiency (DEDE) 2022 and 2023; EGAT; IEA-PVPS 2021,and 2022; Oxford Business Group; PV Magazine; ERIA; CASE for Southeast Asia; Zero Analytics Carbon; Transition Zero; various media sources; IEEFA analysis.

Note: Annual additions vary across IEA-PVPS, DEDE, and ERC datasets. This analysis uses numbers from IEA-PVPS figures until 2021, while ERC's annual reports (2022–2024), DEDE's Thailand PV Status Report 2023 and Performance on Alternative Energy Policy 2026 Statistics are used thereafter.

Appendix II: Assumptions for payback period calculations

1. Household consumption for a 5–10kW system matches rooftop solar output, varying monthly based on the solar PV output estimates from the Global Solar Atlas (optimally sized system). On average, a 5kW system consumes 571kWh monthly, while a 10kW system consumes 1,143kWh.
2. For regular tariff-based systems, daytime consumption is 60% and nighttime consumption is 40%. For TOU systems, daytime consumption is 80% and nighttime consumption is 20%.
3. The peak hour consumption factor for nighttime in a TOU-based system is 17%, while it is 13% during daytime off-peak hours.
4. An on-grid system is a system without a battery.
5. Average per kWp system costs for a 5kW system in 2026 is THB30,000 and THB25,000 for a 10kW system.
6. The normal rate for energy consumption exceeding 400 units is THB 4.42/kWh.
7. The higher tariff-Ft adjustment is fully applied at THB5.45/kWh.
8. The off-peak rate for TOU is THB2.6037/kWh.
9. The peak rate for TOU is PKR5.1135/kWh.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the author

Haneea Isaad

Haneea Isaad is an Energy Finance Specialist at IEEFA. Based in Pakistan, she covers Asian energy markets with a focus on Southeast Asia and Pakistan. hisaad@ieefa.org

Institute for Energy Economics and Financial Analysis