THAILAND INVESTMENT REVIEW

Issue 4/2024

ECO EXCELLENCE: Thailand's at Forefront of Clean Energy

6.



BOI NET APPLICATION

January-March 2024

Total Investment ,412 Projects JSD 13.68 Billion



Total Foreign Investment 889 Projects USD 9.72 Billion

	FOREIGN INVESTMENT BY TARGET SECTORS			
	First S-Curve	New S-Curve		
T	Electronics 66 Projects I USD 4,126.65 M	Digital 38 Projects I USD 642.81 M		
	Automotive 120 Projects I USD 1,127.50 M	Medical 12 Project I USD 83.71 M		
	Petrochemicals & Chemicals 88 Projects I USD 663.96 M	Automation & Robotics 6 Projects USD 29.22 M		
	Tourism 9 Projects I USD 205.86 M	Biotechnology 4 Projects I USD 18.95 M		
	Agriculture & Food Processing 50 Projects I USD 309.27 M	Aerospace 6 Projects I USD 31.93 M		

FOREIGN INVESTMENT BY MAJOR ECONOMIES



Unit: USD (1 USD = 33.5078 THB as of 18 September 2024)

Note: Investment projects with foreign equity participation from more than one economy are reported in the figures for both economies. Statistics on net applications are adjusted whenever applications are returned to applicants due to insufficient information. For more details, please visit **www.boi.go.th**

CONTENT



Cover Story Contributing to Climate Goals Through Thailand's Green Transition



Industry Focus Powering the Future: Thailand's Bold Move to Renewable Energy



Policy Highlight Driving Green Progress: Policies to Sustain Momentum





Executive Talk EPPO's Blueprint: Framing the Future of Clean Energy



Company Interview Unlocking Solar Potential with Constant Energy



Company Interview The Port and the Push: Hutchison Ports Sailing to a Green and Sustainable Future



Thai Economy at A Glance

Climate Coal Through Thailand's Creen Transition

The fact that climate change is becoming more severe is undeniable. The occurrence of extreme weather phenomena such as scorching heat waves, cyclones, forest fires, and rising ocean temperatures is at unprecedented levels, leading to destructive global anomalies and threatening the long-term future of humanity.

When global temperatures reached a record high in July 2023, the United Nations declared the end of global warming and the beginning of the "global boiling" era. Soaring global temperatures in July 2024 underlined this assertion.

Responding to this warning, nearly 200 countries collectively took stock of their efforts to curb the global temperature rise for the first time at the COP 28 UN Climate Change Conference in December 2023. The key conclusion of this conference was that efforts to reduce greenhouse gas (GHG) emissions and limit the global temperature increase to 2°C above pre-industrial levels have been too slow. The adaptation to a changing climate and the provision of support for vulnerable nations were also found to have been inadequate.

Energy received particular emphasis, given that fuel combustion—which releases carbon dioxide, methane, nitrous oxide, and fugitive emissions from coal, oil, and gas—accounts for over three-quarters of all GHG emissions worldwide.

According to the International Energy Agency (IEA), global CO2 emissions from fuel combustion increased by 1.3% in 2022, surpassing the period before the COVID-19 pandemic. This trend reflects the fact that humans rely heavily on fossil fuels, which account for up to 81% of the worldwide total energy supply, with 30% coming from oil, 28% from coal, and 23% from natural gas. Of all fuel combustion emissions, coal accounted for 45%, followed by oil at 33% and natural gas at 22%.

A remarkable result of the COP 28 meeting was that it was the first time countries collectively set targets for energy-related emissions to meet the net zero emission goal by 2050 milestone. These targets emphasize the significant role of renewable energy by tripling its capacity and doubling global energy efficiency improvements by 2030, expediting the transition away from fossil fuels and the adoption of emerging technologies like low-emission hydrogen and carbon capture.

Working towards these targets will set the stage for a global change in human behavior at all levels, scaling up investment worldwide in clean energy, including renewables and nuclear, as well as low-emission hydrogen, and reducing investment in fossil fuels. The IEA has reported that emerging and developing economies need to triple their clean energy investments by 2030 from their levels in 2022. These investments will include abatement and removal technologies such as the capture, utilization, and storage of carbon.

Witnessing Thailand's Green Transition

A striking aspect of the "global boiling" situation is its disproportional impact on countries, even when they are economically interconnected. According to the UN, the Asia and Pacific region stands to face the harshest impact, even though the G-20 group of countries accounts for 80% of global GHG emissions. Thailand released 372,716.86 GgCO2eq of GHG emissions in 2019, approximately 0.7% of the global share and lower than the world average, but the country is among the top ten most vulnerable to climate change.

In its most recent findings, Germanwatch—an independent organization that has been compiling the Global Climate Risk Index for 16 years—has placed Thailand as the world's ninth most affected by weatherrelated losses at USD 7.7 billion in purchasing power parity and 0.82% per GDP unit during 2000-2019.

Based on its assessment of the economic impacts of climate change, Swiss Re Institute placed Thailand as the third most vulnerable country with a potential GDP loss of 0.36% per year, placing it behind only the Philippines at 3% and the United States at 0.38%. Other countries ranked in the top ten included Austria, China, Taiwan, India, Australia, Switzerland, and Japan, in descending order.

Given its perilous situation, it is not surprising that Thailand has enthusiastically embraced the United Nations Framework Convention on Climate Change (UNFCCC)'s Paris Agreement, becoming part of the first group of countries to participate. The country has declared a long-term goal of carbon neutrality by 2050 and net-zero greenhouse gas emissions by 2065.

In the 2nd updated Nationally Determined Contribution (NDC), the country set the goal of reducing GHG emissions by 30-40% to 370 MtCO2eq by 2030 compared with the 20-25% projected business-as-usual level in the earlier plan. Thailand has also declared its commitment to continue upgrading related plans for GHG emission reduction, adaptation, and actions in the forestry and cement sectors; the adoption of carbon capture and storage (CCS) technology; and climate-smart agriculture.

Energy Transition Key to Zero Emission Pathway

In accordance with UNFCCC reporting requirements, Thailand has tracked six main types of greenhouse gas emissions: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Energy and transportation are the primary sources of the country's GHG emissions, accounting for approximately 70%, followed by agriculture at 15%, industrial processes and product consumption at 10%, and waste at 5%.

The burning of fossil fuels for energy and transportation is the primary source of Thailand's CO2, the main greenhouse gas, with the energy sector responsible for 40% of all CO2 emissions, followed by transportation at 30%, and manufacturing and construction at 20%, with other activities accounting for 10%. Of the fossil fuels used in the energy and transportation sectors, 40% are oil, followed by coal at 28% and natural gas at 32%.

Thailand's plan to reach its peak for GHG emissions from all sources in 2025 and record carbon neutrality by 2050 to achieve net zero GHG emissions by 2065, consistent with the 2-degree



pathway, was outlined in the updated mid-century Long-Term Low Greenhouse Gas Emission Development Strategy (LT-LEDS) in 2022.

The energy and transportation sectors are the primary targets of the GHG mitigation strategies mentioned in Thailand's LT-LEDS. The identified measures to transition to a low-carbon society include increasing energy efficiency, adopting bioenergy and carbon capture and storage (CCS), and upgrading the power grid system. The transportation's modal shifts, increased energy efficiency, and the development of new, effective fleets of vehicles are all necessary steps in this process.

In more detail, Thailand's LT-LEDs are predicated on a 50% renewable energy share for total power generation by 2050, energy efficiency across all sectors, and a shift away from fossil fuels in transportation. It also estimates that by 2035, 70% of new vehicles will be electric, including battery-electric and plug-in hybrid vehicles.

For the current state, results tracked by the Thailand Greenhouse Gas Management Organization showed that in 2020, Thailand had already achieved a 15% reduction in GHG emissions from energy and transport activities compared to the business-as-usual level through renewable energy power generation, bioenergy use in transportation, and energy efficiency improvements in power generation and the cement industry.

Regulatory Support for Contribution in All Sectors

Thailand's transition to a low-carbon society requires contributions from all sectors and stakeholders. To encourage this, the Thai government has ensured that a supportive institutionary environment and regulatory framework are in place to the sharing of low-carbon business models, research and technology development, and capacity building among domestic and international investors.

Last year, the Thai government established the Department of



Climate Change and Environment under the Ministry of Natural Resources and Environment which, in addition to being responsible for the design, monitoring and evaluation of policy, also oversees coordination among public and private agencies as well as international organizations, to advance the implementation of the mitigation and adaptation policies outlined in the LT-LEDS.

The department is now pushing for the enactment of the Climate Change Act, which will stimulate the private sector's implementation of GHG reduction measures and make them Thailand's new business norm. The legislation draft aims to require mandatory GHG emission accounts and carbon footprint assessments in specific industries. It has also established tools such as the Climate Change Fund to provide financial assistance to both the public and commercial sectors in GHG reduction initiatives such as carbon credits and the promotion of renewable energy use. Moreover, the law seeks to regulate Thailand's Emission Trading System (ETS), carbon tax and carbon credit program.

In the 2024 Climate Change Performance Index (CCPI), Thailand was upgraded by an impressive 17 spots to 25th place. Issued annually, the CCPI ranks 63 nations and the European Union in four categories: GHG emissions, renewable energy, energy use, and climate policy.

There is a lot of work still to do, but Thailand's commitment to implementing a zero-emissions pathway and fulfilling its international pledges will strengthen its economy, boost its resilience to change, and conserve the environment. ■

Powering the **Future:** Thailand's Bold Move to Renewable Energy

The global demand for energy has been surging for decades, with fossil fuels—coal, oil, and gas—shouldering most of the burden. However, this reliance on carbon-heavy sources has come at a steep cost: escalating greenhouse gas emissions, a warming planet, and threats to human health and the environment. It's clear there is a need for change. The world has reached a pivotal moment, demanding a shift toward reliable, resilient, and sustainable energy sources that can curb climate change while still driving economic growth and enhancing human well-being.

As one of Southeast Asia's most dynamic economies, Thailand finds itself at a critical juncture. The country is under the spotlight as it seeks to balance the urgent global demand for sustainable energy with its own economic development and the expectations of foreign investors. While Thailand has long championed energy development, particularly in renewable energy and energy efficiency, the burning questions remain: How is Thailand navigating the global shift towards sustainable energy, and what role will it play in this new era?

The Rise of Renewables

Renewable energy is no longer a mere trend; it's the driving force behind the global shift towards a sustainable future. In recent years, the world has witnessed a rapid expansion in renewable energy capacity, driven by policy support and dramatic cost reductions in technologies like solar photovoltaics (PVs) and wind power. These advancements have made renewable energy more affordable and accessible to households and businesses alike. According to the International Energy Agency (IEA), global electricity demand surged by 2.2% in 2023, with China, India, and Southeast Asia leading the charge. The demand is expected to continue rising, growing by an average of 3.4% annually through 2026. As energy consumption climbs, however, so too does the share of electricity generated from low-emission sources like nuclear and renewables, such as solar, wind, and hydropower.

In the past year alone, global renewable capacity additions soared nearly 50%, reaching an impressive 510 GW. By 2026, lowemission sources are expected to account for nearly half of all global electricity generation, up from 39% in 2023. Specifically, the share of renewables is set to increase from 30% in 2023 to 37% by 2026, driven largely by the continued expansion of cost-effective solar PV. This growing trend underscores the need for countries to adapt to the shifting energy landscape and embrace clean, sustainable energy solutions.

Global Commitments and Regulatory Shifts

To fuel the transition to renewable energy, governments worldwide are rolling out new policies, rules, and regulations. At the international level, the UN Climate Change Conference (COP28) concluded with an ambitious landmark agreement to triple renewable energy capacity and double energy efficiency improvements by 2030.

The European Union (EU) has taken a leading role in this changing energy environment by introducing a 'transition period' for the implementation of its Carbon Border Adjustment Mechanism (CBAM). Beginning on 1 October 2023, and lasting until 31 December 2025, this mechanism requires importers of goods in six key product categoriescement, electricity, fertilizer, iron and steel, aluminum, and hydrogen-to report the carbon emissions associated with their production. Simultaneously, the US is introducing a draft of the Clean Competition Act to the Congress, which when finalized, may introduce a similar carbon border adjustment mechanism for energy-intensive imports.

While these regulations aim to tackle the climate crisis and reduce global greenhouse gas emissions, they also have significant implications for global manufacturing and trade. Countries with less environmentally friendly industries will face pressure to align with emerging green production trends.

Thailand's Strategic Response

In response to these global developments, Thailand is positioning itself as a leader in the transition to renewable energy. With a commitment to achieving carbon neutrality by 2050 and net-zero greenhouse gas (GHG) emissions by 2065, Thailand has set ambitious clean energy targets. The country aims to reach 50% of its new power capacity from renewable sources by 2050. In 2022, renewable energy accounted for approximately 13% of Thailand's total electricity generation, but this share is expected to rise to 68% by 2040 and 74% in 2050.

Meeting these targets will require substantial investments in renewable energy and energy efficiency. Over the 15-year period from 2022 to 2037, new renewable energy investments are expected to total THB 779 billion (USD 22 billion), while investments in energy efficiency across industrial, commercial, residential, and agricultural sectors are expected to reach THB 974 billion (USD 28 billion).

In September 2024, Thailand's Ministry of Energy is set to unveil the annual National Energy Plan,





featuring key initiatives such as the Alternative Energy Development Plan (AEDP) and the Energy Efficiency Plan (EEP). These plans will focus on expanding clean energy production and improving energy efficiency, with the ultimate goal of achieving netzero emissions by 2065.

The new National Energy Plan also aims to increase the share of electricity generated from renewable sources to over 50%, leveraging solar, wind, and biomass from the agricultural sector. Despite the higher costs associated with renewables compared to fossil fuels, the Royal Thai Government is encouraging businesses to adopt clean energy to comply with international trade standards, including CBAM. The plan also explores the potential of new technologies, such as pumped storage hydropower and small modular reactors (SMRs), to enhance the country's energy infrastructure.

To support this transition, the Royal Thai Government is easing regulations to facilitate access to renewable energy. This includes support from banks through low-interest loan programs for households that install solar panels. Additionally, the country is expected to increase LNG procurement to meet its daily energy demands.

Although Thailand's current renewable energy production falls short of its ambitious targets, the country is opening new opportunities for businesses and entrepreneurs to participate in the clean energy industry. In 2022, the Energy Regulatory Commission introduced a feed-in-tariff (FIT) scheme to encourage investment in renewable energy projects, including utility-scale solar, battery storage, wind, and biogas.

Recently, the Royal Thai Government initiated a pilot project allowing data centers to purchase renewable energy directly, making it easier for international tech giants to achieve their green goals in Thailand. Former Prime Minister Srettha Thavisin emphasized that clean electricity will be a crucial competitive advantage in the coming era. As a result, the implementation of both the Utility Green Tariff (UGT) and direct power purchase agreements (Direct PPA) will unlock new opportunities for Thailand.

Powering the Future with Thailand

Thailand's ambitious target of achieving a 50% renewable energy share under the upcoming National Energy Plan is a testament to its commitment to a cleaner and greener environment and its readiness to accommodate large-scale foreign investments. With a reliable electricity grid, welldeveloped infrastructure, and a resilient private sector, Thailand is well-positioned to lead the region in the transition to sustainable energy.

The door is open for international partners to collaborate with Thailand in advancing green, clean, and sustainable energy solutions, ensuring a prosperous and environmentally responsible future for all.

Driving Green Progress: Policies to Sustain Momentum

Since Thailand committed to achieving its own climate goals alongside those of the global community, "clean energy" has become a national priority. The government's steadfast undertaking to promote green energy in accordance with international environmental protection measures has already compelled many investors to adjust their supply chains to minimize greenhouse gas emissions. Having established itself as a key destination for global investors, Thailand is therefore accelerating its efforts to address any limitations holding back the transition to green energy and ensure widespread access to clean energy for both domestic businesses and multinational companies looking to expand their investments or relocate their production bases to the country.

In recent years, the government has recognized the urgent need to generate electricity from renewable energy sources. As a result, it has continuously purchased renewable energy under the Power Development Plan. Most recently, the government has procured green electricity under the 2022-2030 Feed-in Tariff (FiT) scheme for renewable energy. Additionally, guidelines have been developed to establish green electricity tariff rates and to implement oversight measures ensuring that the management and certification processes for green electricity sources are efficient and meet international standards under the Utility Green Tariff (UGT) program.

The UGT program was proposed by the Energy Regulatory Commission (ERC) in 2021 as a tool to connect businesses seeking to use clean energy with green electricity producers through government mechanisms. Under this program, purchasers of green electricity receive a Renewable Energy



Certificate (REC), which can be used to demonstrate to export destination countries that the producer has genuinely utilized green electricity. This helps avoid potential impacts from various trade barriers related to international greenhouse gas reduction goals.

The UGT program classifies green electricity into two types:

1) UGT 1: This involves purchasing energy from existing renewable energy power plants within the government's system without specifying the source. It includes a premium fee on top of the regular electricity bill.

2) UGT 2: This involves purchasing energy from new renewable energy power plants, where users can specify the electricity source. The green electricity tariff is based on the selected source. Currently, the ERC has proposed the UGT 1 tariff rate to the Electricity Generating Authority of Thailand (EGAT) and has begun accepting applications from interested participants. Meanwhile, the tariff rate for UGT 2 is now under consideration and is expected to be announced by the end of 2024.

In addition, to meet the increasing demand for clean energy from foreign investors, the government has approved a pilot project for Direct PPA (Power Purchase Agreement). This allows the direct purchase of electricity from renewable energy sources through third-party access (TPA) to the electricity grid, particularly benefiting data center companies with high energy needs that must maintain a sustainable supply chain as required by their parent companies. This project will be implemented within a framework



of no more than 2,000 megawatts. Companies eligible to participate in this project must be large-scale investments that operate equally in every country in which they invest, and they must not sell electricity back into the national grid.

Currently, the Direct PPA pilot project is still undergoing an impact study, along with the development of TPA service charges to cover various key costs, such as the Wheeling Charge, Connection Charge, System Security Charge/Ancillary Services Charge, Imbalance Charge, and Policy Expenses. These service charges will be set to ensure fairness and appropriateness, and they will be aligned with the proposed green electricity tariff rates under the UGT program. It is anticipated that these processes will be completed by 2024.

Regarding the Thailand Board of Investment (BOI), the new investment promotion strategy emphasizes the importance of sustainability and encourages industries to invest in and use clean energy in their production processes. For the production side, the BOI offers incentives to those investing in related activities, including the production of electricity or electricity and steam from renewable sources. Specifically, investments in production from solar, wind, biomass, or biogas are eligible for eight years of corporate income tax exemption. For production from garbage or refuse-derived fuel, an eight-year corporate income tax exemption privilege is granted with no cap.

As part of promoting the use of clean energy, the BOI operates under the Smart & Sustainable Industry initiative. Two of the investment areas encouraged by the BOI for industry enhancement include energy conservation and the use of renewable energy to reduce environmental impact. Businesses listed in the BOI's promoted activities can apply for additional benefits for efficiency improvements, regardless of whether they have previously received incentives or not. These businesses may also be eligible for a corporate income tax exemption of up to three years, amounting to 50% of the investment made towards upgrading their industry.

Additionally, the BOI has been promoting green investments related to reducing community-level environmental pollution, especially addressing PM 2.5 issues, through various methods such as Fireline construction, the use of weirs to store water, providing tools and equipment to suppress forest fires, and conducting training on forest fire prevention and management. Businesses that support forest management and PM 2.5 reduction, in accordance with specified criteria as approved by the Ministry of Natural Resources and Environment, will be exempt from corporate income tax on their operating income for a period of 3 years, up to a maximum of 200% of the actual investment made in supporting local organizations and farmer groups.

The policies and measures outlined above are just examples of the efforts taken by government agencies, including the BOI, to help Thailand achieve its climate change goals, particularly in the energy sector. However, there are many other measures still being promoted, such as supporting solar rooftop installations and implementing net-metering for electricity. These initiatives aim to encourage the long-term production of clean energy. It is believed that such measures will strengthen Thailand, enhance its resilience, and prepare it to navigate global changes in the future, positioning the country as a regional leader in clean energy. ■



EPPO's Blueprint: Framing the Future of Clean Energy

Thailand stands at a critical crossroads on its energy transition journey. Achieving carbon neutrality by 2050 and net-zero emissions by 2065 are crucial milestones that must be reached to secure the country's future. However, current efforts need additional support to drive Thailand toward a sustainable energy future. Setting a clear direction for national energy policy is, therefore, essential, in terms of both improving efficiency and ensuring coordinated efforts across all relevant sectors. The Energy Policy and Planning Office (EPPO) plays a vital role in developing a national energy plan to guide the country toward sustainable economic and social development. Today, we are honored to have Dr. Veerapat Kiatfuengfoo, Director General of the EPPO, to discuss the development of the national energy plan and the implementation of the policies under this plan which are key to achieving Thailand's net-zero greenhouse gas emissions target.



Thailand is one of the most well-prepared countries when it comes to supporting the future growth of clean energy."

Dr. Veerapat Kiatfuengfoo Director General of the EPPO

How does the National Energy Plan define goals and strategies for driving clean energy?

The National Energy Plan (NEP) serves as a crucial framework outlining the strategies for sourcing and securing energy supplies. Three key factors guide the plan's direction: energy security, environmental considerations, and pricing or trade competitiveness. The NEP also includes various sub-plans addressing specific objectives. For instance, the Power Development Plan (PDP) identifies sources of electricity, while the Alternative Energy Development Plan (AEDP) assesses the potential of renewable energy from various sources in Thailand. However, these plans are all ultimately connected to the common goal of utilizing energy use across different sectors.

Currently, climate change issues significantly impact the formulation of national energy plans, especially as countries set increasingly ambitious greenhouse gas emission goals. These goals often lead to the establishment of regulations or mandates for clean energy usage, compelling businesses to develop more sustainable portfolios. As a result, it is essential that Thailand assess its current energy potential and strategize additional energy sourcing that aligns with existing demands.

In Thailand's case, to achieve its greenhouse gas emission goals for 2050 and 2065, it is necessary to generate at least 51% of the country's electricity

from renewable energy sources by 2037. However, setting these figures must be done with careful consideration. If the proportion of renewable energy is set too high, it could affect the country's energy security. This is because the production of certain types of renewable energy, such as solar or wind power, is highly variable depending on weather, which could result in periods where the energy capacity does not meet demand at that time.

In the context of the world's changing demands, how has the current National Energy Plan been adjusted?

The planning of the NEP is based on energy usage forecasts from national-level plans, such as the National Economic and Social Development Plan, as well as internal agency forecasts. This results in a comprehensive energy demand forecast. However, such planning may not fully account for energy demands under new policies, such as attracting investments in data centers. As a result, the initial plan does not place significant emphasis on green energy conditions.

Nonetheless, the NEP has been designed to be highly flexible and prepared to facilitate electricity trading in a liberalized electricity market. In this way, the extra demand can be fulfilled through the Direct PPA policy. Additionally, the various plans under the NEP are reviewed and updated every 3-5 years, with annual monitoring being carried out to assess whether the plans have met their goals. Exceptions are made in cases of significant changes, which may prompt a special review, such as was the case after the severe economic impacts from COVID-19. Taking everything into account, it can be said that these plans are well-adjusted to align with the country's context at any given time.

Regarding the current energy landscape, the promotion of clean energy is still progressing as planned. However, overall energy supply exceeds demand, as the demand decreased during the COVID-19 period. As such, there is a need to revise the forecasts. Currently, demand figures are steadily increasing, and it is noteworthy that the peak energy usage occurs during the night, a time when solar power cannot be produced. Given the fact that some households or industries may generate their own electricity from solar power during the day, the total daytime electricity demand might surpass the amount recorded by the central system.

What policies and measures are currently in place to support the clean energy industry?

One significant clean energy policy currently in place is the Utility Green Tariff (UGT). Under this policy, the government acts as a Single Buyer, aggregating energy from various renewable energy producers to create a renewable energy portfolio. This portfolio is then sold to businesses or manufacturers seeking to consume clean energy. In a sense, this can be viewed as a form of Direct PPA, but with the government acting as the aggregator instead of a private entity.

Another form of Direct PPA involves private entities acting as investors and selling directly to customers, utilizing the central transmission and distribution network, with the government serving as an intermediary for connectivity. At present, efforts are being made to amend relevant regulations, such as those governing access to power transmission and distribution lines or managing risks associated with the variable production of certain renewable energy sources. This includes the need to designate responsible parties and establish backup systems in case electricity production falls short of demand at any given time.

Regarding the current progress of the UGT policy, the UGT 1 pricing system has been established and subsequent steps have already been executed due to the fact that it involves selling clean energy from existing renewable power plants. For UGT 2, its implementation has not yet been announced as it has to align with production from new renewable energy power plants with no fuel costs, also known as RE Biglot, which are expected to start supplying the system next year. This power purchase is part of the 2021-2030 power procurement plan, which aims to purchase approximately 8,000-9,000 MW from renewable energy sources with no fuel costs, such as solar and wind energy. About 5,000 MW of this has already been procured, with about 3,600 MW remaining to be announced soon.

In addition to the aforementioned policies, the government is also promoting household solar power generation. Under the PDP2024 plan, there is a goal to increase electricity purchases from households. This allows households or private entities with excess electricity production to sell to the grid, enabling faster return on investment. To enable more comprehensive data collection on household solar power generation, plans are underway to amend relevant regulations and requirements. For instance, there are proposals to mandate engineer inspections for household solar cell installations and the requirement of result reporting. This would allow the Energy Regulatory Commission (ERC) to collect data more systematically.



Finally, regarding the attraction of foreign investment, while current regulations require majority Thai ownership in power plants, the government does not prohibit joint ventures between Thai and foreign investors. In recent times, foreign investment has primarily taken the form of technology and innovation contributions.

What trends and challenges should Thailand be aware of?

Environmental concerns affect both suppliers and consumers of energy, particularly the private sector, which is inevitably compelled by regulations to transition towards sustainability. Therefore, accelerating the procurement of clean energy has become essential. However, as more power plants are built, it becomes crucial to focus on infrastructure. New power plants are often small-scale and distributed across various areas nationwide. This necessitates a comprehensive network and efficient management systems such as Smart Grid or Grid Modernization. Examples include RE forecast centers that help predict electricity generation from renewable power plants for different periods, or Smart Meters and System Operators with rapid processing capabilities. These systems enable the maximum utilization of existing power plants and incoming energy power plants.

What key points would you like to share with investors to build confidence in investing in Thailand?

Thailand has consistently been committed to transitioning toward sustainable practices and promoting the use of clean energy. The government is currently focused on building sufficient supply and infrastructure, as well as providing the necessary facilities to support businesses that aim to adopt clean energy. At the same time, the National Energy Plan serves as a guarantee of our firm dedication to achieving these goals. On that account, Thailand is one of the most well-prepared countries when it comes to supporting the future growth of clean energy. ■

Unlocking Solar Potential with Constant Energy

Under the latest draft of Thailand's Power Development Plan (PDP 2024), the country is setting ambitious goals to increase the share of clean energy in final energy consumption to 51%, up from 36% in PDP 2018. Notably, solar energy—both land-based and floating—will play a pivotal role in achieving this goal, with an expected contribution of around 41,000 MW, accounting for more than 50% of total electricity generation from all sources. This shift positions solar energy in Thailand, one name stands out. Constant Energy embarked on its pioneering journey when the significance of clean energy was still underappreciated by many Thai businesses. Today, with the issue of green transition having become central to corporate development, Constant Energy has established itself as a leader in the field. We are honored to have Mr. Franck Constant Energy has grown in Thailand and how it is helping Thai companies shape the new energy landscape.



"

Thailand's clean energy sector is ripe with opportunities for investors, supported by strategic corporate initiatives, government backing especially from the BOI, and a growing corporate focus on sustainability."

What are the supporting factors that make companies choose to invest in Thailand's clean energy industry?

Constant Energy's extensive management expertise and deep understanding of Thai market dynamics enable efficient navigation and capitalization of emerging opportunities, ensuring sustainable growth. In addition, Thailand's history as a pioneer in ASEAN in renewable energy adoption, favorable government policies, a supportive regulatory framework for FDI and a level playing field in the power sector have all further enhanced its attractiveness over the last 20 years. Thailand's strategic geographical location in Southeast Asia also offers a gateway to other burgeoning markets in the region. Additionally, residing in Bangkok with my family for over 20 years and having long-standing involvement in the conventional and renewable power plant

business in Thailand and globally since 1995 has afforded me unique insights into the market. This experience has been crucial in guiding our strategic direction and understanding of local market dynamics and opportunities, which ultimately led to our decision to choose Thailand as the base for establishing our company.

When the Thai government began promoting clean energy through subsidy programs in 2009, we recognized the potential despite eventual slowdowns in subsidies. Fortunately, Thailand's position as a factory hub for many multinational corporations (MNCs) with significant energy demands and strong financial capabilities presented a unique opportunity to provide low cost but world class green power to our industrial clients in Thailand. In 2017, Constant Energy pioneered the solar corporate Power Purchase Agreement (PPA) business in Thailand, a move that was helped by the cost of solar panels dropping to a level where we could offer clean energy at prices lower than the grid tariff. This strategic move allowed us to invest more in Thailand and reliably service the substantial energy needs of these MNCs in a cost-effective way while supporting Thailand's decarbonization goals and reducing its reliance on imported oil and gas.



How does Constant Energy promote the use of solar energy among customers, and how does your company see the shift towards solar energy being influenced by these efforts?

For large industrial power consumers, maximizing the utilization of solar power is a nobrainer. Solar power today is by far the lowest-cost power source, especially in ASEAN, where it's cheaper than gas, coal, oil, or hydro. It's also quick to install and fully decarbonized. When our customers receive this proper information, they want as much solar power as possible sold to them. The main obstacles are the incumbent oil and gas companies or utilities, which may lose out on revenues from selling black or grey power generated by coal, oil, or gas. Governments have to strike a balance to ensure a just transition to renewable powernot too quickly, so as to allow incumbents a chance to adapt to new energies.

In terms of implementation, we first offer customized solutions by conducting comprehensive assessments of each client's unique needs and operational dynamics. By crafting tailored proposals that emphasize specific benefits for their business, we ensure our solutions align seamlessly with their strategic objectives and operational requirements. This personalized approach maximizes the relevance and appeal of solar energy for each client. Additionally, we leverage case studies and testimonials from existing clients who have successfully integrated solar energy into their operations, showcasing real-world success stories. These examples provide

compelling evidence of the reliability and effectiveness of our services, helping to build trust and credibility among potential clients. Our active participation in industry discussions is another key strategy. We engage in panel discussions, industry forums, and conferences to raise awareness about the numerous benefits of solar energy. This involvement positions us as thought leaders and advocates for renewable energy adoption, reinforcing our commitment and expertise in the field. Additionally, we form strategic partnerships and support various coalitions that advocate for regulatory changes to promote clean energy. By being part of these influential groups, we help shape the policies that facilitate the adoption of solar energy, creating a more favorable environment in which our clients can then transition.

Many companies, especially those in the Fortune 500, recognize that the shift towards clean energy is driven by global trends, overcoming trade barriers, cost savings, and staying competitive, among other factors. For Constant Energy to be selected as a business partner by companies like Nestlé, Coca-Cola, and Western Digital, the key factors are our world class standards and local expertise. We can deliver both high engineering standardstop of the class HSE-and the local knowledge necessary to navigate the complex landscape of permits and regulations involved in the energy business. This blend of international quality and local insight sets us apart and ensures we meet the stringent requirements of our clients.

What is your perspective on the direction and trends of Thailand's clean energy industry, including the country's progress in achieving environmental and climate change goals?

From our perspective, the direction and trends of Thailand's clean energy industry have evolved significantly over the years. We've observed a notable shift in corporate attitudes towards renewable energy, driven by two main factors. First, there's a growing market incentive for companies to go green and enhance their ESG (Environmental, Social, and Governance) profiles to stay competitive. Businesses increasingly recognize that a strong commitment to sustainability positively impacts their brand reputation and attracts ecoconscious consumers and investors. Second, advancements in technology and the decreasing costs of solar panels and other renewable energy solutions have made these projects commercially viable without the need for government subsidies. This economic benefit means that end users can now access renewable energy at a lower cost than conventional energy, making the switch not only environmentally responsible but also financially attractive.

The shift in client engagement and perceptions can be significantly attributed to the increased promotion of solar energy, including our active participation in industry discussions, panels, forums, and influential groups. Our involvement in these platforms has been crucial in educating the market and building trust in solar energy solutions. By consistently sharing insights, showcasing



In what ways has the company received support and promotion from government agencies and/ or the Thailand Board of Investment?

The BOI of Thailand has been great. It has truly been a pleasure working with this efficient state authority to develop our solar investments for clients in Thailand. Other state authorities could take a cue from the BOI in supporting a level playing field for foreign investors, ensuring policy visibility, and enhancing the speed of execution and handling of dossiers. We were able to obtain our investment promotion certificate from the BOI in just 3 to 4 months. It would be wonderful if other government agencies could provide licenses to compliant investors and operators in the power business at the same speed, as this would certainly make the power sector in Thailand more efficient and competitive!

What challenges is the company currently facing, and what are its expectations for your business in the future?

The first key challenge we face is the expansion of solar installations for our clients. A significant hurdle is the limited rooftop space available for solar panels, further complicated by the fact that third-party asset (TPA) initiatives have yet to be launched. TPA is a key to enable Thailand to be first in class in renewable power investment deployment. To address this, we have proactively conducted comprehensive studies in collaboration with the government and consulted with experts, including those from Chulalongkorn University, EPPO and ERC. These efforts have given us a deep understanding of the anticipated regulatory environment, ensuring that we are well-prepared to implement this strategy effectively for our clients once the TPA initiatives are introduced.

What opportunities do you see for the clean energy sector in Thailand, and what final messages do you have for investors interested in this sector?

Thailand's clean energy sector offers numerous opportunities for investors, driven by several positive developments and strategic initiatives. For instance, Virya Energy, a Belgian company active in the development, financing, and operation of projects in the field of energy transition, has invested in Constant Energy, reflecting the growing trend of foreign investments in Thailand's clean energy sector. This investment is a significant step forward for Thailand's clean energy landscape, exemplifying the potential for future opportunities as more international investors recognize the benefits of contributing to the country's renewable energy sector.

The country is well-positioned for significant advancements in clean energy utilization, supported by strategic efforts from companies like ours. By advocating for renewable energy solutions among Fortune 500 companies, we set a precedent that encourages other businesses to adopt similar practices. This not only accelerates the overall shift towards clean energy but also enhances Thailand's reputation as a leader in sustainable development.

Moreover, the Thai government's continuous support and incentives for renewable energy projects further bolster the sector's attractiveness. Favorable policies and financial incentives make clean energy projects more feasible, driving increased investment and development in this area. Additionally, the increasing focus on corporate sustainability goals among Thai businesses are creating a higher demand for clean energy solutions. Constant Energy, known for its high ESG standards and gold status in the global EcoVadis sustainability ranking, is well-positioned to assist these corporations in meeting their green objectives, thereby promoting a more sustainable future and generating more opportunities for clean energy adoption.

There is also evidence that Thailand is exploring the transformation and liberalization of its electricity market, which would allow private sector participation in the national electricity network. This move is essential for enhancing competitiveness and potentially lowering electricity prices in Thailand. Additionally, such liberalization could attract hightech sectors, like data centers, which require a substantial portion of their energy consumption to come from renewable sources.

In summary, Thailand's clean energy sector is ripe with opportunities for investors, supported by strategic corporate initiatives, government backing especially from the BOI, and a growing corporate focus on sustainability. These factors collectively create a solid environment for the growth and success of renewable energy projects in the country.



The Port and the Push: Hutchison Ports Sailing to a Green and Sustainable Future

Since its establishment in 2006, Hutchison Ports Thailand has been on a significant voyage of growth and transformation. As the leading port operator in Thailand, Hutchison Ports has not only made substantial contributions to the logistics industry but also served as a crucial connecting node in the regional supply chain. With a commitment to becoming a global leader in sustainable terminal operations, the company has embraced the net-zero agenda as the latest milestone on its continuing journey. Today, we have the opportunity to learn more about how Hutchison Ports Thailand is navigating this challenging mission as we speak with Mr. Stephen Ashworth, Managing Director of Thailand & South East Asia, Hutchison Ports.



"

Climate change represents one of the most significant shifts we've observed in recent years. Over the past decade, Hutchison Ports Thailand has made considerable progress in adopting clean technologies."

Mr. Stephen Ashworth Managing Director of Thailand & South East Asia, Hutchison Ports

Since Hutchison Ports Thailand first invested in Thailand, what changes have you seen to your business direction?

Hutchison Ports Thailand is an integral part of Hutchison Ports Group, a subsidiary of CK Hutchison Holdings Limited, which is publicly listed on the Hong Kong Stock Exchange. As one of the world's largest global port operators, the group oversees 53 ports across 24 countries, spanning continents such as Asia, the Middle East, Africa, Europe, America, and Australia. Hutchison Ports Group collectively handles about 10% of the world's total container port volumes. Hutchison Ports currently has port interests in Thailand, Vietnam, Myanmar, Malaysia and Indonesia in the South East Asia region and each terminal plays a critical role in the region's logistics network. In recent years, operations at Hutchison Ports Thailand have undergone significant changes. Laem Chabang Port, the base of Hutchison Ports Thailand, ranks among the world's largest and busiest ports, processing around 9 million TEUs last year alone. As a major operator at Laem Chabang, Hutchison Ports Thailand commands approximately 40% of the market share.

Despite a slowdown during the COVID-19 pandemic, the business trajectory is now on an upward trend. In February 2024, the company experienced a remarkable 46% growth compared to the same month the previous year. This surge is attributed to the global economic recovery, increased consumer activity in North America and Asia, and a shift in cargo sources from China to Southeast Asian countries such as Thailand, Malaysia, and Indonesia, due to many companies adopting a "China Plus One" policy. This diversification effort aims to safeguard the supply chain and has resulted in a significant influx of cargo and robust growth. However, potential uncertainties such as the upcoming U.S. presidential election, which could spark a tariff war, or evolving situations in the Middle East and the ongoing Russia-Ukraine conflict, might impact future trends.

What impacts are you experiencing from the trends of climate change, sustainability, and clean energy?

Climate change represents one of the most significant shifts we've observed in recent years. Over the past decade, Hutchison Ports Thailand has made considerable progress in adopting clean technologies. As recently as 2015, the company primarily relied on diesel-powered equipment at its ports. However, in the ensuing years, there has been a deliberate shift towards sustainable practices aimed at decarbonizing operations and transforming Hutchison Ports into an environmentally friendly port operator.

At the new Terminal D at Laem Chabang Port here in Thailand, all cranes used for our operations are electrically powered, significantly reducing carbon emissions compared to more conventional operations. Furthermore, a transition towards electrically powered trucks is underway. More importantly, the company is advancing towards fully digitalized and paperless processes. These sustainable practices are not only implemented at our Thailand terminals but are also being applied globally across our group. The company's current





goal is to manage the business with near-zero carbon emissions by 2050, a target that has been audited and verified in accordance with the Science Based Targets initiative's (SBTi) net-zero standard. This transformation extends beyond Hutchison Ports to encompass the entire supply chain. Shipping lines for instance are pursuing their own net-zero agendas and exploring cleaner fuel options for their vessels. Increasingly, these shipping lines are requesting port operators to provide shoreside electrical power so that vessel engines can be turned off while docked, thereby reducing fuel consumption. Even suppliers are integrating green initiatives at the core of the industry's transformation. These sweeping changes, most implemented in the last three to four years, underscore Hutchison Ports' commitment to advancing environmental agendas and achieving the highest possible environmental credit rating.

As a foreign company investing in Thailand, what kind of assistance and incentives did you receive from the Thailand Board of Investment?

Generally speaking, the Board of Investment (BOI) supports Hutchison Ports Thailand by offering incentives for new projects. These include exemptions from import duties for equipment brought into the country, tax incentives as well as the issuance of work permits for foreign expatriates. However, there is potential for further support, particularly in facilitating our green transformation initiatives. For instance, Hutchison Ports Thailand has invested heavily in electric trucks and cranes for use at the terminal. These electric options are considerably more expensive than their diesel counterparts. Additional financial support from the BOI to help offset these higher costs would be highly beneficial. This would not only accelerate Hutchison Ports Thailand's transition to more sustainable operations but also align with broader environmental goals.



What are the company's plans for the next steps in Thailand?

From the perspectives of both Hutchison Ports Thailand and our global headquarters, Thailand has consistently been an attractive investment destination. Hutchison Group's interests extend beyond port operations; we are also major shareholders in Watsons, the largest retail outlet in the country, which now boasts over 600 stores. Substantial investments continue to be made in our port facilities here, and we remain committed to expanding our presence. Hutchison Ports approaches opportunities in Thailand with an open mind, recognizing the country as a crucial growth engine for South East Asia. ■

THAI ECONOMY AT A GLANCE

Key Economic Figures



GDP (2023) USD 513.5 Billion



GDP Growth



Source: NESDC (Data as of July 2024)



Export Figures

 Export value (USD million)

 Jan-Dec 2022:
 297,156.86

 Jan-Dec 2023:
 292,738.04

 Jan-Jul 2024:
 182,921.57



MDES



Market Profile (2023) Population 66.04 Million Minimum Wage THB 330-370 US\$ Approximate USD 9.17-10.29 Source: Ministry of Labour

Top 10 Export Markets (Jan-Jul 2024)

Rank	Value (USD Million)	Share
United States	32,700.28	17.88%
China	22,017.91	12.04%
Japan	14,371.04	7.86%
Australia	7,727.12	4.22%
Malaysia	7,715.13	4.22%
Hong Kong	7,044.58	3.85%
India	7,022.15	3.84%
Vietnam	6,907.56	3.78%
Singapore	6,432.34	3.52%
Indonesia	5.972.98	3.27%

Top 10 Exports (Jan-Jul 2024)

	Goods / Products	Value (US\$ million)	Share
	Vehicles and Parts	19,206.74	10.50%
	Computers and Parts	13,942.35	7.62%
. ;	Jewelry Products	9,952.07	5.44%
-	Rubber Products	8,244.15	4.51%
	* Machinery and Parts	5,944.18	3.25%
	Plastic Pellets	5,597.48	3.06%
	Refined Fuel	5,449.58	2.98%
	Integrated Circuits	5,120.75	2.80%
	Chemical Products	5,071.10	2.77%
	Teleprinters, Telephone Sets & Parts	4.931.60	2.70%



Tax Rate

Corporate Income Tax: 0 - 20% Personal Income Tax: 5 - 35% VAT: 7% Witholding Tax: 1 - 15% Source: the Revenue Department (As of July 2024)





ABOUT BOI

รั่างรับเขานั่นในอาจะสมมารถี่ยมสะมารถี่ยม CIFICE OF THE GOARD OF INCOMMAN The Office of the Board of Investment (BOI) is the principle goverment agency that operates under the Prime Minister's Office for the purpose of encouraging investment in Thailand. We at the BOI serve as the professional contact points for investors, providing them with useful investment information and services. We offer business support and investment incentive to foreign investors in Thailand, including tax and non-tax incentives. A few non-tax incentives include granting land ownership to foreigners and facilitating visas and work permits. Besides serving the needs of overseas investors, we also offer consultation services to Thai investors who are interested in investment opportunities abroad.

BOI OVERSEAS OFFICES



Head Office, Office Of The Board Of Investment

555 Vibhavadi-Rangsit Road, Chatuchak, Bangkok 10900 Thailand Tel: +66 2553 8111 Fax: (+66) +66 2553 8315 E-mail: head@boi.go.th

Los Angeles

Thailand Board of Investment, Los Angeles Office: Royal Thai Consulate-General, 611 North Larchmont Boulevard, 3rd Floor Los Angeles CA 90004, USA Los Angeles CA 90004, USA Tel: +1 323 960 1199 Fax: +1 323 960 1190 E-mail: boila@boi.go.th

New York

Thailand Board of Investment, New York Office 7 World Trade Center, 34th Floor, Suite F. 250 Greenwich Street. New York 10007, U.S.A. Tel: +1 212 422 9009 Fax: +1 212 422 9119 E-mail: nyc@boi.go.th

Stockholm

Thailand Board of Investment, Stockholm Office: Östermalmstorg 1, 4th Floor 114 42 Stockholm, Sweden Tel: +46 8 5025 6558, +46 8 5025 6559 Fax: +46 8 5025 6500 E-mail: stockholm@boi.go.th

BOI Marketina



Frankfurt

Thailand Board of Investment, Frankfurt Office: Investment Section, Royal Thai Consulate-General Liebfrauenberg 26, 60313 Frankfurt am Main. Federal Republic of Germany Tel: +49 069 9291 230 Fax: +49 069 9291 2320 E-mail: fra@boi.go.th

Paris

Thailand Board of Investment, Paris Office: Ambassade Royale de Thaïlande 8, Rue Greuze, 75116 Paris, France Tel: +33 1 56 90 26 00-01 Fax: +33 1 56 90 26 02 E-mail: par@boi.go.th

Mumbai

Thailand Board of Investment, Mumbai Office: Express Tower, 12th Floor, Barrister Rajni Patel Marg, Nariman Point, Mumbai, Maharashtra 400021, India Tel: +91 22 2204 1589-90 Fax: +91 22 2282 1525 E-mail: mumbai@boi.go.th

Osaka

Thailand Board of Investment, Osaka Office: Royal Thai Consulate-General, Bangkok Bank Building, 7th Floor, 1-9-16 Kyutaro-Machi, Chuo-Ku, Osaka 541-0056, Japan Tel: +81 6 6271 1395 Fax: +81 6 6271 1394 E-mail: osaka@boi.go.th

Tokyo

Thailand Board of Investment, Tokyo Office: Royal Thai Embassy, 8th Fl., Fukuda Building West, 2-11-3 Akasaka, Minato-ku, Tokyo 107-0052 Japan Tel: +81 3 3582 1806 Fax: +81 3 3589 5176 E-mail: tyo@boi.go.th

Seoul

Thailand Board of Investment, Seoul Office: #1804, 18th Floor, Koryo Daeyeongak Center, 97 Toegye-ro, Jung-gu, Seoul, 100-706, Republic of Korea Tel: +82 2 319 9998 Fax: +82 2 319 9997 E-mail: seoul@boi.go.th

Taipei

Thailand Board of Investment, Taipei Office: Taipei World Trade Center, 3rd Floor, Room 3E 39-40 No.5 Xin-Yi Road, Sec. 5 Taipei 110. Taiwan R.O.C. Tel: +88 6 2 2345 6663 FAX:+88 6 2 2345 9223 E-mail: taipei@boi.go.th

Guangzhou

Thailand Board of Investment. Guangzhou Office: Investment Promotion Section, Royal Thai Consulate-General, Guangzhou No. 36 Youhe Road, Haizhu District, Guangzhou 510310, P.R. China Tel: +86 20 8385 8988 ext. 220-225, + 86 20 8387 7770 (Direct Line) Fax: +86 20 8387 2700 E-mail: guangzhou@boi.go.th

Shanghai

Thailand Board of Investment, Shanghai Office: Royal Thai Consulate General 2nd fl., 18 Wanshan Road, Changning District, Shanghai 200336, P.R. China Tel: +86 21 5260 9876, +86 21 5260 9877 Fax: +86 21 5260 9873 E-mail: shanghai@boi.go.th

Beijing

Thailand Board of Investment, Beijing Office: Royal Thai Embassy, No.21 Guanghua Road, Chaoyang District, Beijing, 100600 P.R. China 100600 Tel: +86 10 8531 8755 to 87, +86 10 8531-8753 Fax: +86 10 8531 8758 E-mail: beijing@boi.go.th

Sydney

Thailand Board of Investment, Sydney Office: Suite 101, Level 1, 234 George Street. Sydney New South Wales 2000, Australia Tel: +61 2 9252 4884 Fax: +61 2 9252 4882 E-mail: sydney@boi.go.th

Jakarta

Thailand Board of Investment. Jakarta Office: Royal Thai Embassy JI. DR Ide anak Agung Gde Agung, Kav. E3.3 No.3 (Lot 8.8) Kawasan Mega Kuningan, Jakarta 12950 Indonesia Tel: +62 817 9800 203 E-mail: jkt@boi.go.th

Hanoi

Thailand Board of Investment, Hanoi Office: Roval Thai Embassy 26 Phan Boi Chau Street. Hoan Kiem District, Hanoi City, Viet Nam Tel: +84 24 3823 5092-4 E-mail: hanoi@boi.go.th

Rivadh

Thailand Board of Investment, Riyadh Office: Royal Thai Embassy, Riyadh, Kingdom of Saudi Arabia Diplomatic Quarter, P.O. BOX 94359, Rivadh 11693 Tel: (966-1) 488-1174 E-mail: riyadh@boi.go.th