E-Mobility in Thailand

Thailand holds a good position to drive the future of Electric Vehicle (EV) industry, as a regional EV manufacturing hubs and an exciting EV market. EV sales in Thailand is set to accelerate over the next few years following the growing environmental awareness, advancing EV technology, and enabling ecosystem. Interesting opportunities for Dutch businesses are particularly in the fields of e-buses /trucks/boats, charging infrastructure and interoperability , as well as battery technology.

The world is going green and Thailand is jumping on the bandwagon. To transform its transportation industry and push towards de-carbonization, the country sees Electric Vehicle (EV) as a game changer.

Rising consumer's confidence in the long-term advantages of EVs combined with growing environmental consciousness have led to a significant increase in the EV adoption in Thailand, on the back of flourishing investment by both Thai and international investors. Together with a solid development path for the local EV industry, Thailand's EV market is set on an accelerated growth trajectory over the next few years.

According to the Electric Vehicle Association of Thailand (EVAT), the registration of all forms of EVs has doubled from 103,702 in 2017 to 210,126 in April 2021. Of the total, around 94% is passenger cars, followed by motorcycles of 5.8% and the rest for 3-wheelers, buses and trucks. For the EV types, the overwhelming majority (96.5%) is still HEVs and PHEVs, while the proportion of newly registered BEVs has been growing recently.

Following brisk investment from both the public and private sectors, the number of charging stations in Thailand has also increased. Data from EVAT shows as of June 2021, Thailand had 664 charging stations with 2,224 chargers from 10 developers nationwide. Of this total, about two thirds are normal chargers and the remainder (around 700) are quick charging facilities.

Enabling ecosystem and policy

EVs are gaining interests in Thailand supported by favorably evolving policy environment to push the EV market and accelerate the development of EV production and related value chain.

The automotive industry plays a vital role in Thailand's economy, accounting for about 10% of the GDP. Thanks to four decades of developing the technical knowhow, labour force, parts production and supporting facilities, Thailand has thrived to become the "Detroit of Asia" and established itself as the world's 11th-largest automobile production base, with a total output of 2.2 million units in 2020. More than 850,000 people are working in the automotive industry, covering the entire production process.

As the country is trying to become "Thailand 4.0" whose industries transition to technological advances and high-level services, the government has designated "next-generation automotive" development among the top targeted industries and provided supports for EV-related business in an effort to transform from an internal combustion engine (ICE) vehicle to EV production hub in the Southeast Asia or ASEAN.

Toward this goal, the government has developed a flagship project called the Eastern Economic Corridor (EEC) which is a span of investment zones to foster new targeted industries including the EV sector. See link for EEC Factsheet.

A national EV Roadmap

The National Electric Vehicles Policy Committee recently introduced a roadmap which lays out a framework for Thailand's EV development from 2021-2035 with the aim of transforming the country's well-established automotive supply chain for the production of zero-emission vehicles (ZEVs) and building the technological capacity for modern mobility.

The roadmap cover not only EV production and usage, but also development plans for battery manufacturing and supplies, supporting infrastructure, including charging stations and power grid management, and the development of related safety standards and regulations to enable comprehensive and integrated implementation. Note that EVs in the masterplan also cover various types of vehicles including motorcycles, tricycles, buses, trucks and ferry boats.

On the production side, the committee has raised a target of locally made ZEVs (BEVs and FCEVs) from 30% of total domestic vehicle production to 50% by 2030. This means by 2030 Thailand will have 6.22 million EVs: 2.93 million cars and pickup truck, 3.13 million motorcycles and 156,000 buses and trucks. And all vehicles produced in Thailand should be ZEVs by 2035.

For the EV usage, the government plans to gradually phase out of ICE vehicles as a number of constraints remain e.g. the higher price of EV themselves, the vehicles' low range per charge and the limited availability of chargers, and well as the transitioning period required by the parts suppliers.

Nevertheless, as part of Thailand's goal to reach zero carbon emission by 2065-2070, the government has set an ambitious target for the registration of new cars to be 100% ZEVs by 2035. The public sector will take a leading role in targeting ZEV procurement and use in public mass transit. By 2025 all vehicles procured for government agencies and public fleets are set to be ZEVs, and by 2030 all used by them have to be ZEVs.

The first milestones are to promote e-motorcycles and support infrastructure nationwide, by ensuring that EV users have access to public charging stations across the country with the individual charging stations being located no more than a 50-70 kilometers' radius from one another. The number of charging stations are set at 10,000 by 2025 and 80,000 stations by 2035.

As for the policy to promote technological and innovative development, the target is oriented towards high-technology components such as batteries, drive trains and controller systems as well as EV prototypes.

Ensuring access to power sources

The country's current power generation capacity reserve of nearly 50% of total capacity, higher than the global average of 15%-20%, reflects the country's readiness for the development of EVs.

Under a comprehensive energy investment plan to prepare for the mainstream use of EVs for personal transportation, Thailand aims to develop a Smart Grid and smart EV charging system as well as implementing a "vehicle to grid" (V2G) electricity system to ensure more efficient power distribution to support EV usage. The Electricity Generating Authority of Thailand (EGAT), the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA), have already formed a consortium with PTT Plc to develop a prototype for V2G by using a cloud-based platform to compile the charging profiles and activities of EVs at electricity distributers' servers.

Thailand's national energy plan for the EV industry aims to regulate electricity fees based on a time of use rate, thereby promoting competition among charging business and facilitating a mix of renewable energy supplies such as roof-top solar cells as an energy source. The plan targets the adoption of smart grid technology which analyses EV charging data and the country's usage to manage the efficiency of electricity transmission.

The Ministry of Energy has regulated EV charging rates to ensure cost worthiness, while charging station developers are offering mobile EV charging station applications to provide charging station maps and estimated remaining fuel amounts as part of the drive to facilitate the countrywide adoption of EVs.

A competitive digital infrastructure will also support Thailand's position as the hub of next-generation transportation with a focus on Connected, Autonomous, Shared and Electricity technology in ASEAN, where technology such as IoT, cloud and AI play key roles in driving functionality. Thailand recorded the world's fastest internet speed based on the Speedtest Global Index in 2020, thanks to continued investment in the country's broadband internet facilities and efficient telecommunications system.

Incentives

To accelerate the development of the BEV ecosystem, Thailand Board of Investment (BOI) recently introduced new comprehensive investment promotion incentives covering a broad range of EVs, namely passenger cars, buses, trucks, motorcycles, tricycles, and ships, as well as EV parts and battery charging stations.

The incentives cover both tax and non-tax privileges. Tax incentives include corporate income tax (CIT) exemption or reduction, exemption of import duties on machinery and raw/essential materials used in production for export, and exemption of import duties on goods imported for R&D. Non-tax incentives cover land ownership and work permit & visa facilitation.

The level of tax incentives, particularly the number of years granted for CIT exemption, depends on the importance and the benefit to the country. Please see Annex for specific details of BOI tax incentives for each eligible activity.

Industry's landscape and Dutch business opportunities

The target is a clear signal for automakers, energy producers and other companies to seize the opportunity to invest in EV infrastructure, as the number of people driving electric cars is expected to rise substantially over the next few years.

According to Thailand Board of Investment, investment in EV manufacturing and related infrastructure in the 2017-2019 period reached 79 billion baht ($2.5 billion). Over the next three years, that spending is forecast to rise at a much faster rate.

Thailand's flourishing EV market also sees international and local entrepreneurs undertaking business ventures in a variety of areas, ranging from the manufacture of passenger and commercial EVs, e-buses, e-motorcycles, electric three-wheelers, and electric boats to the introduction of EV battery plants, charging stations, and home-based charging system services.

Many international auto assemblers have already tapped into Thai talented workforce to produce EVs, particularly passenger cars of various types. These include Toyota, Honda, Nissan, Mazda, Suzuki, Mitsubishi, MG/SAIC Motor, BMW, Mercedes Benz, and Audi, as well new comers such as FOMM, Takano and Great Wall Motor.

At a same time, there are still growing prospects in other EV related fields that could be an opportunity for Dutch businesses especially in electric buses/trucks/boats, fast charging infrastructure, and interoperability, as well new battery technology.

Public fleet and commercial vehicles

In line with the Roadmap requiring all newly procured public fleets to be ZEV by 2025, demand for e-buses and e-boats is expected to rise in the next few years.

An initiative to jump start the adoption of BEVs is to support the conversion of traditional combustion buses to electric city transit buses. The selected companies will receive a grant and retired buses from Bangkok Mass Transit Authority (BMTA) to be developed into an E-bus prototype.

Besides, the Ministry of Transport has facilitated battery-driven ferry boats to offer services along the Chao Phraya River and Bangkok's main canals to reduce urban pollution.

Another segment that the Netherlands could capitalize on is commercial vehicles particularly e-trucks and light EVs as the logistics industry in Thailand is booming and companies are gaining awareness on the benefits of EVs both in terms of cost reduction and environment.

Charging infrastructure

One fast-growing field in Thailand is the EV infrastructure business. To stimulate development in the charging business, three state enterprises - EGAT, MEA, and PEA - have collaborated to pioneer investment in both home-based and public EV charging facilities and services. Currently, most EV stations are being developed by private companies eager to cash in on rising demand.

Big companies in Thailand that are investing heavily into the EV infrastructure and charging business include Energy Absolute, PTT Group (by establishing a new subsidiary –EVME Plus Co – to operate a range of services from EV rental to charging and maintenance), Bangchak, PTG Energy (target large electric trucks), and Siam Cement Group. International investors already exist, albeit not in lavish numbers, such as Evlomo in corporation with Tritium and EAST Group.

The opportunities in the development of charging stations also attracted investment from many start-ups in the green energy sector for the sale and installation of home-based charging units and charging systems for residential and commercial areas. Some have chosen to partner up with big international EV equipment brands while others focus on importing chargers from smaller brands. However, most of these companies tend to use online tools to promote their services, with a few expanding their networks of dealerships across the country.

Calls for faster and smarter charging infrastructure will continue to grow in tandem with increasing adoption of EVs and technological advancement. Another prospect lies upon system connectivity and interoperability. There are a number of applications or platforms developed by each service providers, but none are integrated.

Battery technology

Recognising the need to upgrading Thailand's capacity towards high-technology components, the Ministry of Higher Education, Science, Research and Innovation, EVAT and academic institutions have recently joined forces to form Thailand Energy Storage Technology Alliance (TESTA) to drive progress in energy storage technology and ensure that R&D, especially on Lithium-ion batteries, is fully commercialized.

TÜV SÜD has signed a cooperation agreement with Thailand's Ministry of Industry and the Thailand Automotive Institute (TAI) governing the establishment of a battery test centre near Bangkok, which will be the largest and most modern test centre for Li-ion batteries in ASEAN.

Meanwhile, some companies have already invested in EV battery manufacturing. For example, FEV founded a Thai subsidiary in 2018 to support the regional mobility sector in the development of vehicles and components such as electric motors, including batteries and fuel cells. The Mercedes plant in Bangkok started local production of batteries for Mercedes-Benz plug-in hybrids in 2019. Global Power Synergy Plc (GPSC), a power generation arm of PTT Group, opened the first semi-solid battery factory in Southeast Asia in Rayong province in July 2021. And Energy Absolute is building a lithium-ion battery factory in Chachoengsao province.

Other players especially large Thai companies are also looking for new EV battery technology breakthroughs including the next generation of anode/cathode materials and designs that will improve range, cost and environmental impact.

In addition, the Ministry of Industry is working with research institutes and the private sector to manage the end-of-life battery system. They are opened for innovative recycling technology.

Key Stakeholders

Public Sector

- The Ministry of Energy, www.energy.go.th
- The Electricity Generating Authority of Thailand, www.egat.co.th
- The Metropolitan Electricity Authority, www.mea.or.th
- The Provincial Electricity Authority, www.pea.co.th
- The Eastern Economic Corridor Office, www.eeco.or.th
- The Thailand Board of Investment, www.boi.go.th

Relevant Associations and Institutions

- Electric Vehicle Association Of Thailand (EVAT), www.evat.or.th
- Thailand Automotive Institute (TAI), www.thaiauto.or.th
- The Federation of Thai Industries' Automotive Industry Club (FTI's AIC), www.aic.or.th
- The Thai Automotive Industry Association (TAIA), www.taia.or.th
- Mobility and Vehicle Technology Research Center, King Mongkut's University of Technology Thonburi (MOVE KMUTT), www.move.kmutt.ac.th

Related trade fairs and events

A wide variety of regional and domestic fairs and sector-specific events is organized in Thailand and the region throughout the year. At several of these exhibitions, Netherlands Embassies organize events, such as webinars, Holland pavilions, matchmaking, and networking opportunities. Please contact us for more information on relevant trade fairs and our support.

- International Electric Vehicle Technology Conference and Exhibition (iEVTech) & ASEAN Sustainable Energy Week , 14-16 October 2021

We Support Your Business

The Netherlands Embassy in Bangkok offers active support to Dutch companies already present in Thailand, Laos, and Cambodia, and Dutch companies interested in doing business in these countries. Our main services include the following:

- Providing information on sectors and rules and regulations
- Supporting trade missions and visits to Thailand
- Organizing meetings with relevant authorities at local, provincial, and/or governmental level
- Monitoring business opportunities
- Troubleshooting and advising on resolving disputes
- Advising on available instruments and services
- Promoting Dutch businesses in Thailand

Business Support Instruments

The Netherlands government has developed multiple instruments to support Dutch companies in Thailand. Please visit the website of the Netherlands Enterprise Agency (www.rvo.nl/thailand) for more information. Atradius Dutch State Business may help you with your export insurance (www.atradiusdutchstatebusiness.nl).

Relevant Contacts

- Netherlands Enterprise Agency (RVO): www.rvo.nl
- The Netherlands – Thai Chamber of Commerce (NTCC): www.ntccthailand.org
- STZ Thailand Zakelijk: www.thailandzakelijk.com

'NL Exporteert' App

This app provides up-to-date information necessary for doing business internationally. It contains an event calendar, economic and financial data, a country comparator, information on business opportunities, and relevant contacts. Download the app in the App Store or Google Play.

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Annex: Summary of the BOI Tax Incentives for the EV sector

Electric Vehicles

Subject to conditions:

1. The whole investment "Package" must have at least a BEV production project.
2. Within 3 years from the date of issuance of promotion certificate, must produce all type of EVs under the project, as well as a battery (with module production)
3. Within 3 years from the date of production,
   - Must produce at least 1 additional key part (Traction Motor, DCU, BMS)
   - For HEV and PHEV must produce at least 2 additional xEV parts
4. For domestic sale, the products must be certified with standard such as UN R100 R13H R94/95 and Euro5 (For HEV/PHEV)

	Corporate Income Tax (CIT) Exemption		Others
Electric Car	Investment at least 5 billion baht	Investment under 5 billion baht	
- BEVs	CIT 8 years +CIT 1-3 years for R&D	CIT 3 years +CIT 2 years if start production by 2022 +CIT 1 year/1 part (additional from basis conditions) +CIT 1 year if produce BEV > 10,000 cars/year (any of the first 3 years) +CIT 1-3 years for R&D	Exemption of import duties on machinery
- PHEVs	CIT 3 years	CIT 3 years	
- HEVs	No CIT	No CIT	
Electric Bike	CIT Exemption 3-11 years		Exemption of import duties on machinery
3-Wheeler	CIT Exemption 3-10 years		Exemption of import duties on machinery
Battery Electric Bus/Truck	CIT Exemption 3-10 years		Exemption of import duties on machinery
Electric Boat	CIT Exemption 8 years		Exemption of import duties on machinery

EV Parts

Air conditioning system, DC-DC converter, Front/Rear axle for EV bus, Electrical circuit breaker, Portable EV charger, Smart charging system, On-bard charger, Traction motor, BMS, Battery*, DCU, Inverter, High voltage harness, Reduction gear, Battery cooling system, Regenerative braking system, EV connector

	Corporate Income Tax (CIT) Exemption	Others
EV Parts (excluding battery)	CIT Exemption 8 years	Exemption of import duties on machinery and raw/essential material (for export)
EV Battery		
- Pack assembly	CIT Exemption 5 years	90% reduction of import duties on raw/essential materials for 2 years
- Module production	CIT Exemption 8 years	
- Cell production	CIT Exemption 8 years (no cap)	

Battery Charging Station

Must Propose: Smart Charging System development plan, procure plan for parts and equipment
Build at least 40 chargers (with at least 25% are quick type)
Received ISO 180000 within 3 years after certified for promotion

	Corporate Income Tax (CIT) Exemption	Others
EV Charging Station	CIT Exemption 5 years	Exemption of import duties on machinery