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THE FUTURE OF ELECTRIC VEHICLES IN SOUTH EAST ASIA

THAILAND

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THAILAND: AN OVERVIEW

Thailand is the second largest economy in South East Asia after Indonesia. With a GDP of USD 514.7 billion and a population of about 69 million, the GDP per capita works out to nearly USD 7,500 making it the fourth richest nation (after Singapore, Brunei, and Malaysia) among ASEAN countries.

The Thai economy is strongly export oriented with exports accounting for more than 65% of the GDP. At the centre of the Mekong Sub-region, Thailand also functions as an anchor economy for Laos, Myanmar, and Cambodia.

From an automotive standpoint, Thailand is the largest automotive producer in ASEAN and the second largest market after Indonesia.

In 2017, the total vehicle demand was about 871,650 units, while 1,988,823 vehicles were produced locally. The Automotive sector, which accounts for 12% of the GDP, is also one of the key contributors to exports with one in two vehicles produced being exported.

ELECTRIC VEHICLE POLICY AND REGULATORY ENVIRONMENT

Thailand is currently the most active country in South East Asia in terms of developing EV support policies and rolling out incentives specifically targeting EV related investments.

A slew of measures have been launched by the Government including investment promotion incentives through the Board of Investment (BOI), lower excise taxes and waived import duties on battery EVs, standards development by Thai Industrial Standards Institute (TISI), EV charging infrastructure development and development of battery waste management system by Department of Industrial Works. The Government is also aiming to ensure that 20% of all new government vehicle purchases are EVs.

As per the 2015 EV roadmap, by 2019 the Government plans to develop production capability of 1,000 electric buses per year, mass production and distribution capabilities for EVs and EV batteries, and mass production capability for EV motors. By 2036, the plan is to have 1.2 million passenger EVs

on the road, supported by 690 charging stations nationwide.

The BOI incentives for hybrids, plug-in hybrids, battery EVs, electric buses, charging stations and select EV components comprise the following:

- Import duty exemptions on machinery for all economic zones
- Corporate income tax exemptions

Currently, the Government is also deliberating on demand side incentives for locally made EVs. These include tax rebate equal to 10% of retail price (maximum THB 50,000).

Through all this policy support, Thailand aims to be the EV manufacturing hub not only in ASEAN but globally as well. EVs are poised to become the next "champion" product for Thailand, after the success of pickups and eco cars.

CORPORATE INCOME TAX EXEMPTIONS

Hybrids with 1 key EV component production (battery/motor/BMS/DCU)
50% reduction for 5 years if in Eastern Economic Corridor and applied for by December 2017 (Goal: assembly, production by 2021)

Plug-in hybrids
3-6 years exempt depending on no. of local EV components, applications due by December 2018 (Goal: car assembly, production by 2022)

Battery EVs
5-10 years exempt depending on no. of local EV components, applications due by December 2018

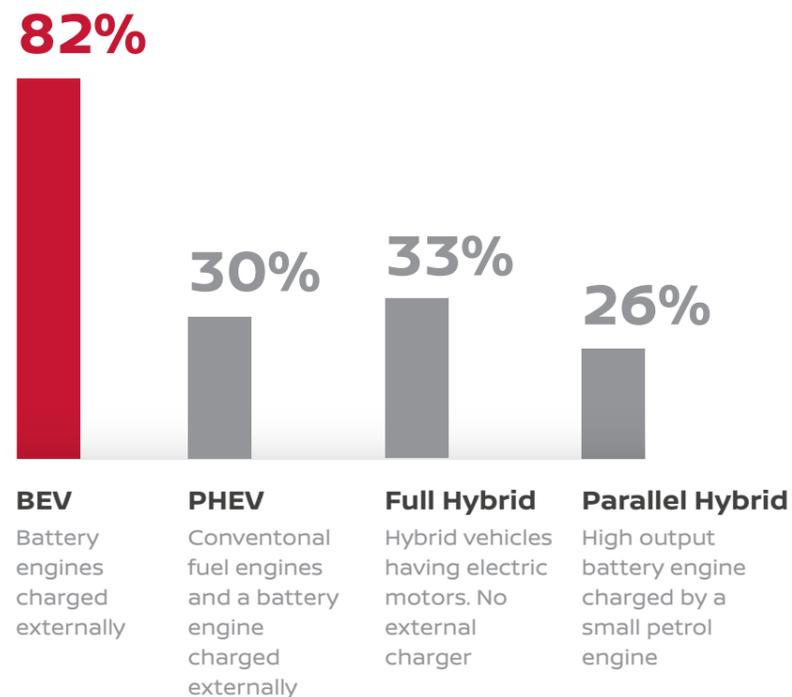
Bus EVs
3-6 years exempt depending on no. of local EV components, applications due by December 2018

EV charging
5 years exempt, applications due by December 2018

AWARENESS ABOUT ELECTRIC VEHICLES



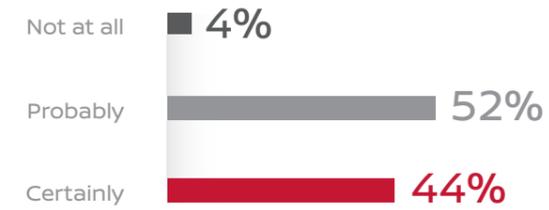
Fig. 1: Technology Association of EVs



In Thailand, over 300 customers were interviewed as part of the study. Despite the low EV uptake, consumers are aware of the differences between various EV technologies such as Battery Electric Vehicles (BEVs), Plug-in Hybrid Vehicles (PHEVs), Full Hybrid, and Nissan e-POWER vehicles.

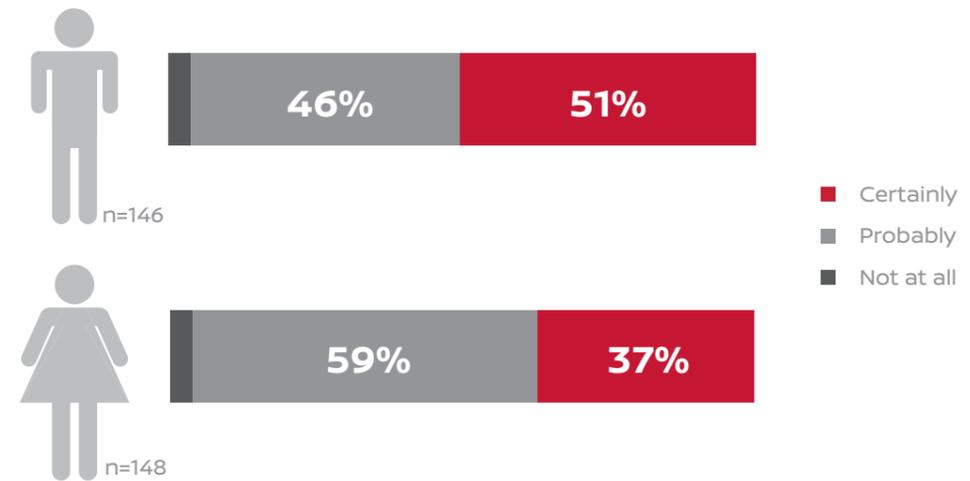
Though the association of EVs with BEVs was the highest at 82%, it was much weaker than other ASEAN markets and marginally below the regional average of 83%. This can mainly be attributed to the significant presence of full hybrids which skew consumers' association of EVs with Hybrids.

Fig. 2: Intention to Buy an EV as the Next Purchase



However, there is significant latent demand for EVs in Thailand. About 44% of the respondents revealed that they would certainly consider EVs when they make their next purchase decision (Fig. 2). Compared to other regional markets, the intention to purchase EVs was found to be among the highest in Thailand.

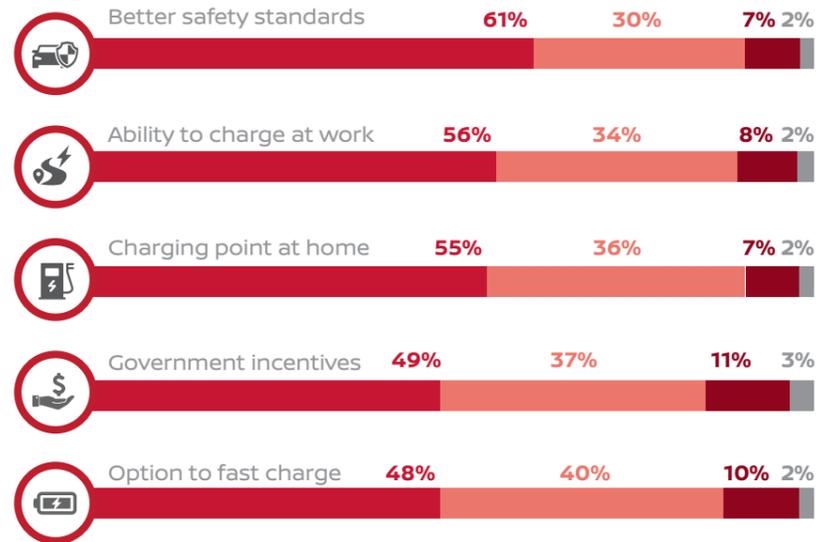
At 51%, men were found to be more enthusiastic about EVs than women (37%).



of respondents are open to purchasing an EV as their next car

KEY FACTORS DRIVING THE ADOPTION OF ELECTRIC VEHICLES

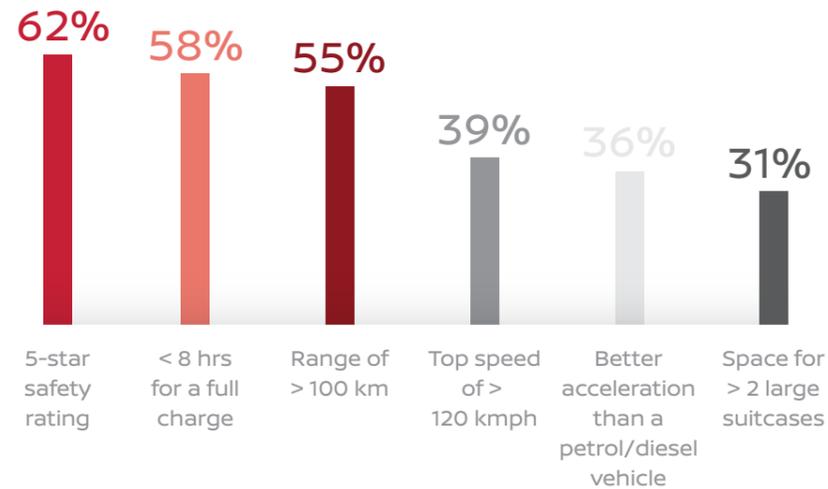
Fig.3: Motivating Factors for EV Purchase



In Thailand, the survey reveals that safety and charging convenience run high on customers' minds (Fig. 3). Government incentives, especially tax breaks come next.

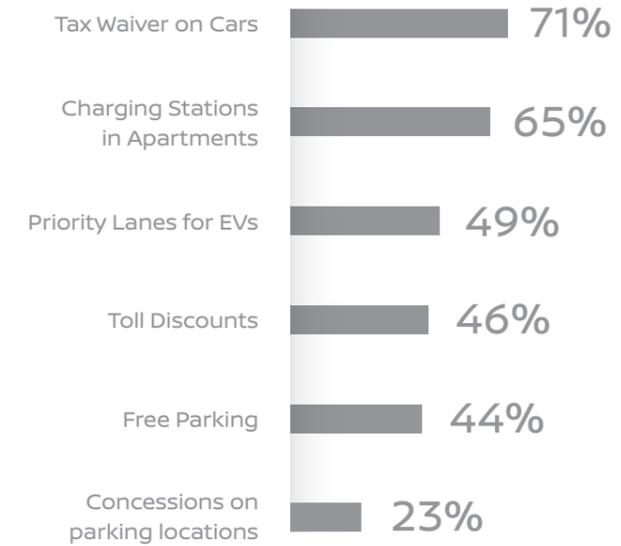
- Very Important
- Somewhat Important
- Slightly Important
- Not Important

Fig.4: Features Important for Customers



Given the importance of safety, it was not surprising that respondents opted for '5-star safety rating' as the most preferred feature if they were to purchase or lease an EV (Fig. 4). About 62% of respondents put this among their top 3 choices while 58% wished for 'Less than 8 hours for a full charge'.

Fig. 5: Incentives Influencing Switch from Conventional Cars to Electric Vehicles



Respondents felt that the government has a critical role to play in promoting EV usage.

About 71% opted for tax waiver from the Government as the key factor that would help them switch from conventional cars to EVs (Fig. 5).

Other (non-financial) incentives that would motivate customers include installation of charging stations in apartment buildings (65%) and priority lanes for EVs (49%).

Fig. 6: Impact of Fuel Source on Electric Vehicle Purchase Decision



Furthermore, while making a purchase decision for EVs, customers would also take into consideration the source of power, and whether it is renewable.

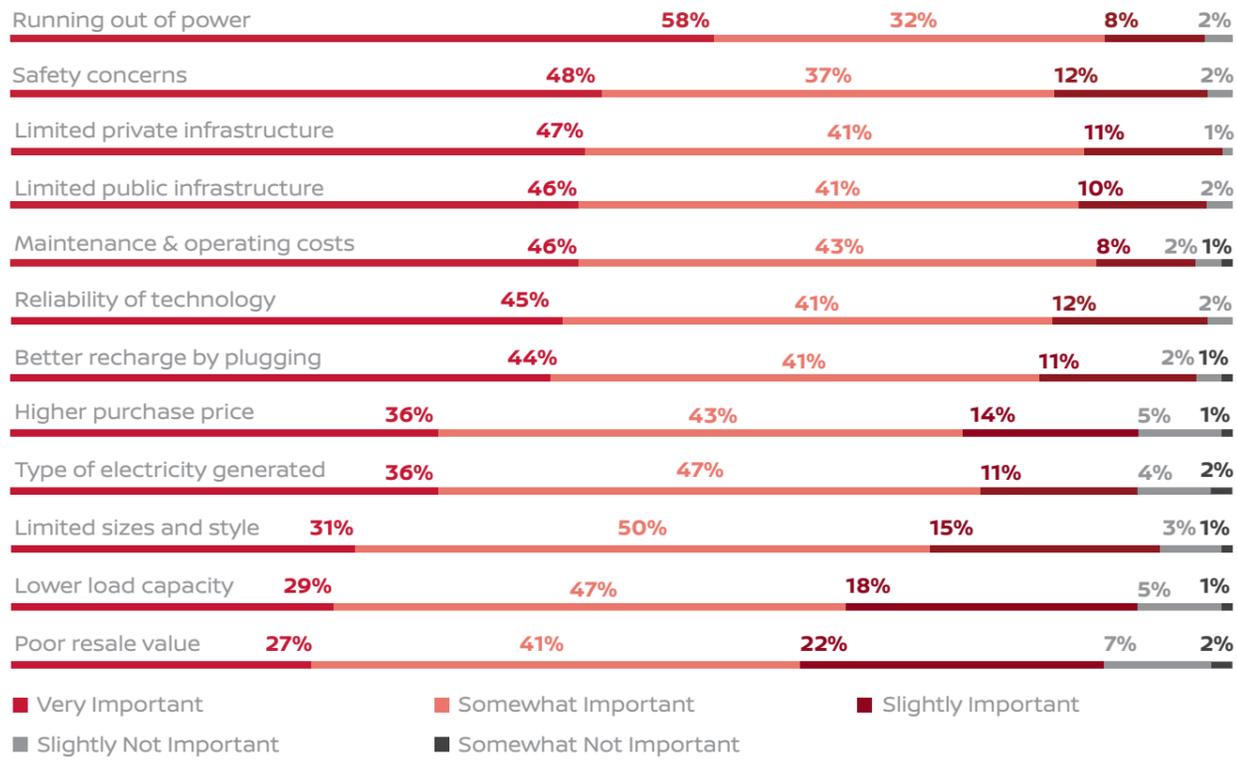
About 75% of respondents mentioned that their choice would be significantly influenced by the source of power (Fig. 6).

However, this concern for the environment was found to be much lower than in other regional markets, the average being about 81%.



BARRIERS TO THE ADOPTION OF ELECTRIC VEHICLES

Fig. 7: Adoption Barriers for Electric Vehicles



While there is significant demand potential for EVs, there are adoption barriers as well.

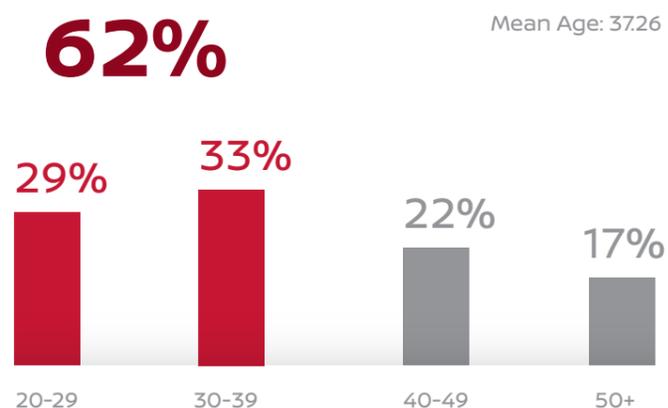
Range anxiety is the main drawback for the adoption of EVs. Customers are also unsure about the safety standards EVs adhere to.

Other adoption barriers include limited public and private infrastructure for charging and operating costs of EVs (Fig. 7).

PROFILING THE EV CUSTOMER

With a strong belief in EVs and their capabilities, 62% of likely intenders are relatively young, less than 40 years old (Fig. 8).

Fig. 8: Age Distribution of Likely EV Buyers



Like in other markets, consumer attitudes correlate with three major profile groups of EV intenders: (1) Environmentalists, (2) Basic Utility Drivers, and (3) Trendy Enthusiasts (Fig. 9).

The features of EVs, the value these potential buyers expect, and the prices they are willing to pay depend on their attitude toward EVs.

Nearly 28% of the EV customer base comprises environmentalists, strongly aware of the ongoing climate change. For these customers, EVs are the right solution for the environment.

Approximately 29% of the intenders are basic utilitarian customers. They give importance to transport with the lowest operating cost, the vehicle

is mainly a means of transport rather than a source of pleasure. For them EVs represent the right technology to meet their utilitarian needs.

The third and the largest group (43%) comprise trendy enthusiasts, who are interested in high-performance and look for a sense of luxury and premiumness. They dislike "old-fashioned" cars, and look for trendy models with innovative technologies. The premium is on advanced features, user-friendly displays, and connectivity options. EVs help project that image.

For an equivalent specification and/or similar performance, more than 60% of EV intenders are willing to pay up to 50% more than a conventional car (Fig. 10).

Fig. 9: EV Intender Profiles

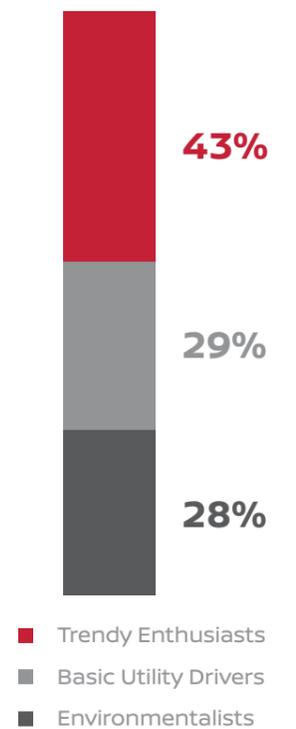
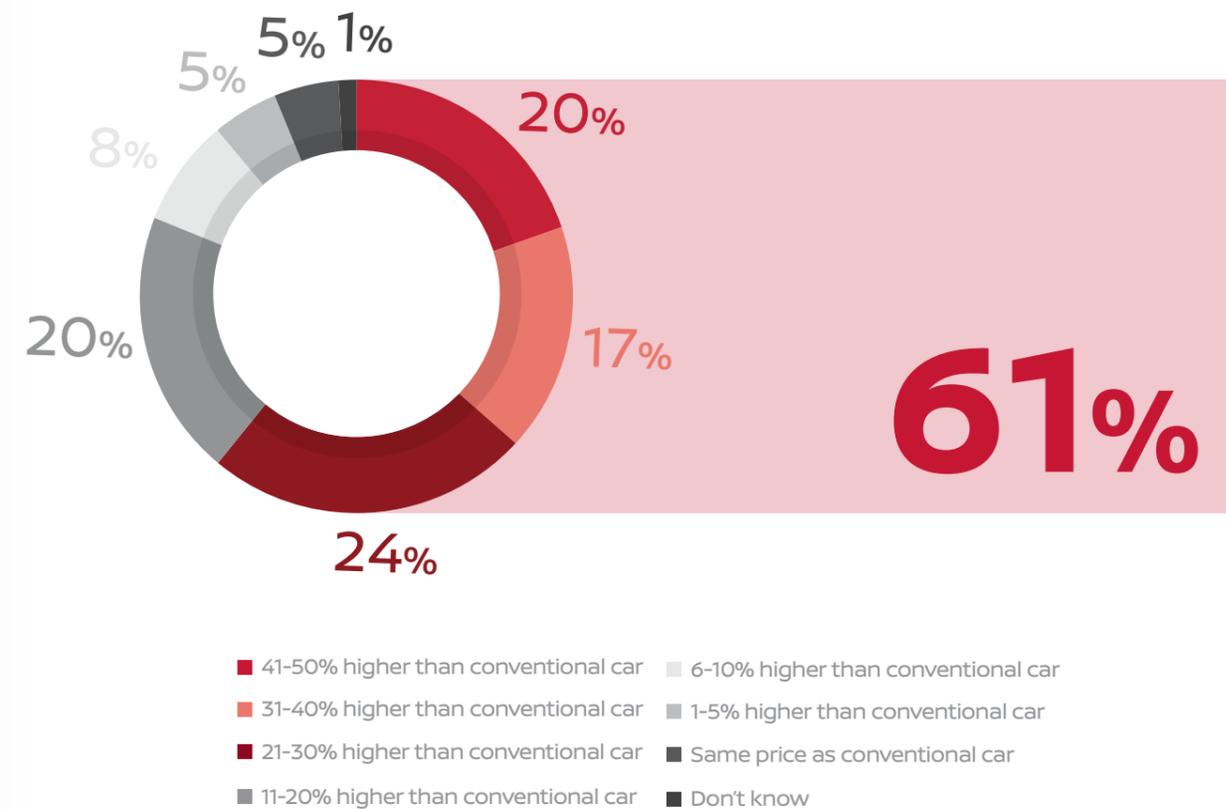


Fig. 10: Premium for Electric Vehicles, by % of Intenders



THE FINAL WORD

South East Asia is in the midst of exciting times. The future of mobility in the region is electric and greener. However, leapfrogging in EV requires strong collaboration between public and private parties, and devising a long-term approach tailored to address each market's unique situation.

Through steady penetration of EVs, the automotive industry is undergoing a virtual transformation of sorts. Nissan is at the forefront of making this transformation happen through the Nissan Intelligent Mobility portfolio. It is a vision to deliver more electrification, more connectivity, and ultimately more autonomy, to move people to a better world.

A1: List of Acronyms

AEC	ASEAN Economic Community
ASEAN	Association of South East Asian Nations
BEV	Battery Electric Vehicle
CNG	Compressed Natural Gas
EV	Electric Vehicle
GDP	Gross Domestic Product
PHEV	Plug-in Hybrid Vehicle
USD	US Dollar

A2: List of Charts

Fig. 1	Technology Association with EVs
Fig. 2	Intention to buy EV as Next Purchase
Fig. 3	Motivating Factors for EV Purchase
Fig. 4	Features Important to Customers
Fig. 5	Incentives Influencing Switch from Conventional Cars to Electric Vehicles
Fig. 6	Impact of Fuel Source on Electric Vehicle Purchase
Fig. 7	Adoption Barriers for Electric Vehicles
Fig. 8	Age Distribution of likely EV Buyers
Fig. 9	EV Intender Profiles
Fig. 10	Premium for Electric Vehicles

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