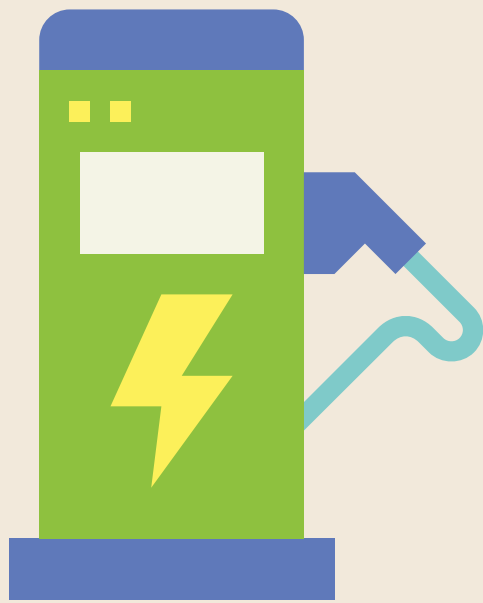


UPCOMING OF EVS TREND IN THAILAND

Economics for natural resources and environment



Introduction

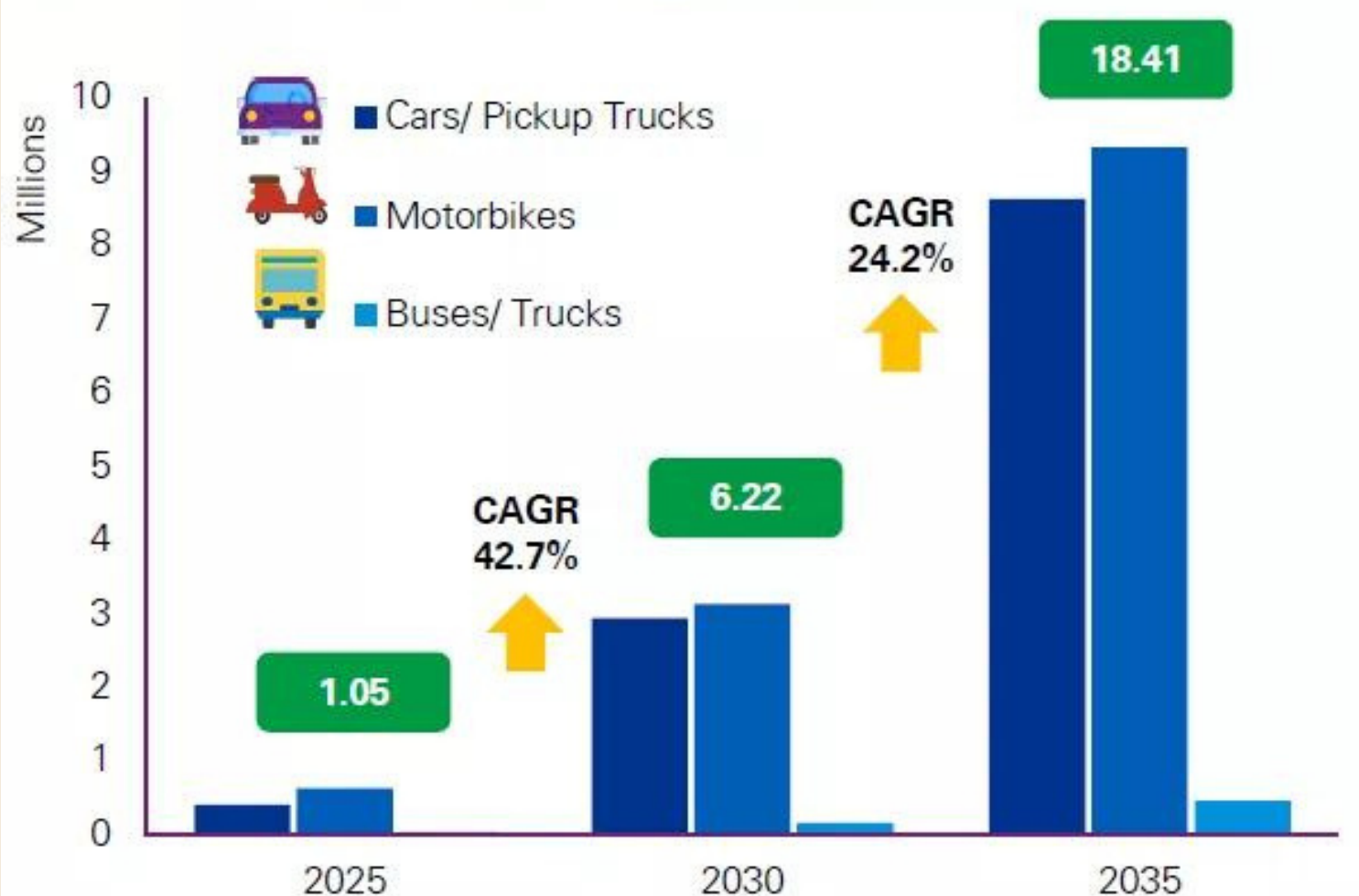
EVs is an electric motor replaces the internal combustion engine in all-electric cars (EVs), often known as battery electric vehicles. The car's electric motor is powered by a massive traction battery pack that must be hooked into a wall outlet or charging equipment, often known as electric vehicle supply equipment (EVSE).



EVs in Thailand

Electric Vehicles, or EVs, are gaining increased interest in Thailand. In the context of transformation in the transportation industry and the push towards decarbonization, EV is a game changer. Thailand has developed a favorably evolving policy environment to provide the right push to the EV market and accelerate the development of EV production and related value chain.

Thailand's EV Production Targets (units)



Source: Ministry of Industry, the information released in March 2021
Remark: CAGR = Compound Annual Growth Rate.

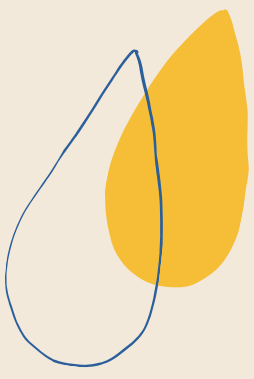
Data from Kasikorn Research Center



The total market for electric vehicles in 2020 registered a total number of 30,705 vehicles, growing 12.8%. But in 2021, it is predicted that the number of registered electric vehicles will be 52,000-55,000 units, an increase of 69-79% from the previous year.



The reason for the huge increase in sales was from government tax subsidies. The Excise Department has reduced the tax rate for EVs to 0% from the normal rate of 2%. Including making the price less than 1 million baht of a 100% electric car makes it easier for consumers to own.



EVs TREND IN THAILAND

The trend of the popularity of using electric cars has continued to **increase** due to several factors as follows:

1. **Solving environmental problems and pollution** Whether it's solving the problem of PM2.5 dust or trying to reduce emissions. Electric cars have better efficiency and lower emissions than combustion engine cars.
2. **Economic reasons and sources of energy sources** Europe is now able to generate more electricity from renewable energy than fossil fuel electricity. To help reduce the use of oil that needs to be imported from outside the region. Therefore, it is a better strategic choice.
3. **Reasons for the value of use** Even though investing in electric cars has a higher initial cost. But it has lower fuel and maintenance costs. making use in the industrial sector.

WHY EVs STILL HAVE DELAYED DEVELOPMENT IN THAILAND

SEVERE IMPACT ON THE AUTOMOTIVE SUPPLY CHAIN

in Thailand due to the smaller number of parts Will affect many SME businesses, which in this group are mostly small-medium-sized businesses with no potential to adapt

DELAYED RESPONSE FROM MAJOR THAI AUTOMAKERS

it creates a new investment burden While many entrepreneurs have not returned their investments in the past. Entrepreneurs do not want to rush into new industries. Pushing electric cars that still use internal combustion technology, such as hybrid electric cars.

IMPORTED ELECTRIC AUTOMOBILES FROM CHINA

Tax exemptions for exports and imports of other vehicles were stated in the 2005 ASEAN-China Free Trade Agreement (before electric vehicle technology became prominent), the selling price of electric cars imported from China will be no customs charge but on the downside, this will stymie the promotion of domestic electric vehicles.

CLIMATE CHANGE AND EVS

Electric vehicles (EVs) are an important part of meeting global goals on climate change.



The amount of energy from a fuel source

that is transformed into actual energy for driving a vehicle's wheels is referred to as energy efficiency. AEV batteries convert 59 to 62 percent of energy into vehicle movement, whereas gas-powered vehicles convert only 17 to 21 percent. This means that charging an AEV's battery contributes more to actual vehicle power than filling up at a gas station.



Electric cars reduce emissions

Emission reduction, including reduced usage of fuel, is another pro for all-electric vehicles. Because they rely on a rechargeable battery, driving an electric car does not create any tailpipe emissions which are a major source of pollution. In addition, the rechargeable battery means much less money spent on fuel, which means all energy can be sourced domestically



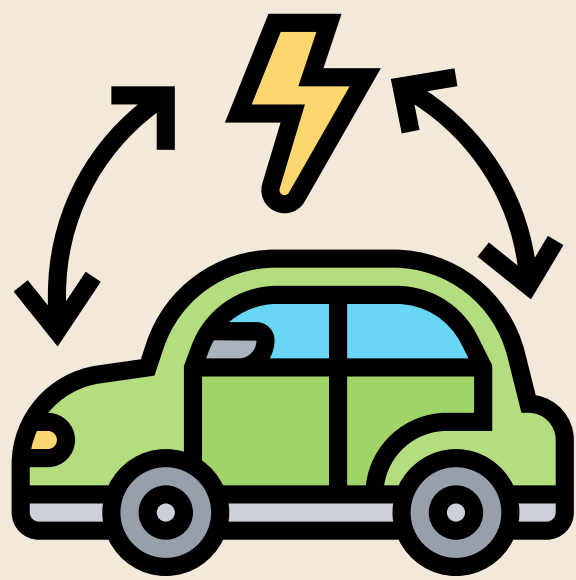
Electric vehicles are high-performing and low-maintenance vehicles.

All-electric vehicles are high-performance vehicles with quiet, smooth motors that require less maintenance than internal combustion engines. The driving experience can also be enjoyable because AEV motors are snappy and have good torque.

Lowest cost and emissions overtime

When you buy an electric car there is a high up-front cost, but your electric vehicle ends up costing less over a lifetime. And also aims to reduce emissions and improve air quality. Plus, a home charging point will usually be fitted for free when you buy an EV car.





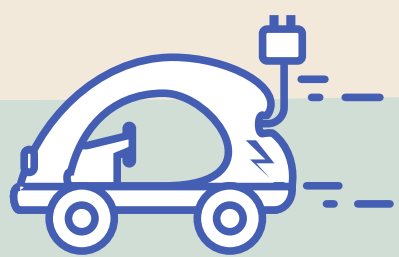
ARE ELECTRIC CARS BETTER FOR ENVIRONMENT?

- The major benefit of electric cars is the contribution that they can make towards improving air quality in towns and cities. With no tailpipe, pure electric cars produce no carbon dioxide emissions when driving.

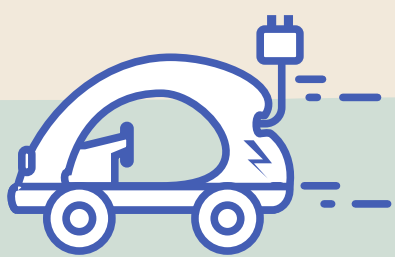
- electric cars give us cleaner streets making our towns and cities a better place to be for pedestrians and cyclists. In over a year, just one electric car on the roads can save an average 1.5 million grams of CO₂.

- EVs can also help with noise pollution, especially in cities where speeds are generally low. As electric cars are far quieter than conventional vehicles, driving electric creates a more peaceful environment for us all.

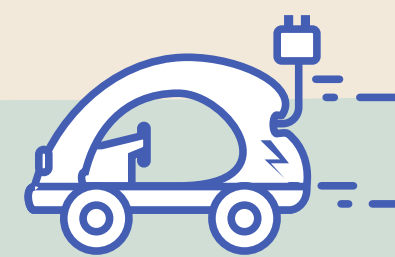
HOW EVS AFFECT THE ENVIRONMENT



Making electric cars does use a lot of energy. Even after taking battery manufacture into account, electric cars are still a greener option. This is because of the reduction in emissions created over the car's lifetime



The emissions created during the production of an electric car tend to be higher than a conventional car. This is due to the manufacture of lithium ion batteries which are an essential part of an electric car



More than a third of the lifetime CO₂ emissions from an electric car come from the energy used to make the car itself. As technology advances, this is changing for the better.

POLICY



The chairman of the National EV Policy Commission declared on May 12, 2021, that electric vehicles will account for at least 30% of total domestic vehicle production by 2030 in order to transform Thailand into a low-carbon society. To promote the use of EVs, the Commission issued some of the following policies.

1. To guarantee that Thailand's resource management is ready for the change, the Power Development Plan must be evaluated and revised as part of the national agenda to reflect the power demands for EVs.

2. For producers and consumers, the Commission is considering both tax and non-tax incentives . However, the incentive plans should not just be aimed at attracting new EV players, but also at existing local manufacturers that have the potential and are willing to adapt to the change.

3. Policy and laws for EV dismantlement and EV battery recycling, as well as a legal framework to support the second-life usage of degraded EV batteries as energy storage systems, should be established to complete the product cycle of EVs and encourage the sustainability of the EV ecosystem so that the expired battery would not turn into a electronic waste that can cause pollution and harm the environment.

4. Regulations regarding internal combustion engine vehicle registration, as well as policies on excise tax for electric vehicles and internal combustion engines vehicles, should be reconsidered and reorganized to boost domestic demand for EVs and gradually reduce the usage of ICE vehicles.

5. Due to the compatibility of various types of EVs and EV parts differs by region, official standards, such as industrial standards for specifications, efficiency, test categories, and other major characteristics of EVs and EV batteries, must have a wider enough scope to cover all types of EVs in order to allow market access and a diverse range of new EV technologies.

SUGGESTED POLICY

1. During the early stages of policy change, Thailand's auto components industry should concentrate on the demands of the electric vehicle segment, such as batteries and motors.

3. Manufacturers of automobiles and automobile parts must increase their competitiveness by creating materials that reduce the weight of the vehicles that could help to reduce the amount of greenhouse gas emissions in which they are installed for example aluminium and carbon fiber.

2. The government should temporarily waive import tariffs on batteries and motors to make the product price more competitive to the conventional car, and stimulate the overall local market for electric vehicles.

4. In terms of infrastructure, such as electric car charging stations, policy should be adopted on a trial basis to accommodate battery-only vehicles. To avoid risk and minimize any potential subsidies, the government should encourage private sector participation.