Taiwan's 2050 Net Zero Carbon Emission Path and Strategic Planning

-The 7th key strategic plan

ELECTRIC & CARBON-FREE VEHICLES

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中華民國交通部
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, R.O.C.

Outlines

- **Transition Strategy**
  - **Taiwan's 2050 Net Zero Transition Strategy and Transportation Transition Strategy**
- **ELECTRIC & CARBON-FREE VEHICLES**
  - **Targets and Strategies**
  - **Roadmap and Action Plans**
  - **Key Performance Indicators and Benefit**
  - **Just Transition Assessment**
  - **Inter-ministerial Cooperation**

Transition Strategy

Taiwan's 2050 Net Zero Transition Strategy and Transportation Transition Strategy

Taiwan's 2050 Net Zero Transition Strategy

Four Strategies and Two Foundations

Transition Strategy

Energy Transition	Industrial Transition	Life Transition	Social Transition
Wind, Solar, System integration, Storage	High-tech, Traditional manufacturing, Construction industry, Electric vehicles, Food, Agriculture, Forestry, Resource recycling	**Green Transport, Electric environment,** Residential, Business, Lifestyle	Just Transition Civic Participation

Governance Basis

Technology R & D	Climate Legal System
Net Zero Technology Negative Emission Technology	Legal System and Policy Basis, Carbon Pricing, Green Finance

TAIWAN 2050 Net Zero Transition Strategy

TAIWAN 2050 Net Zero Transition

12 key strategic plan

Taiwan's Transportation Transition Strategy 1/2

Electrification of vehicles

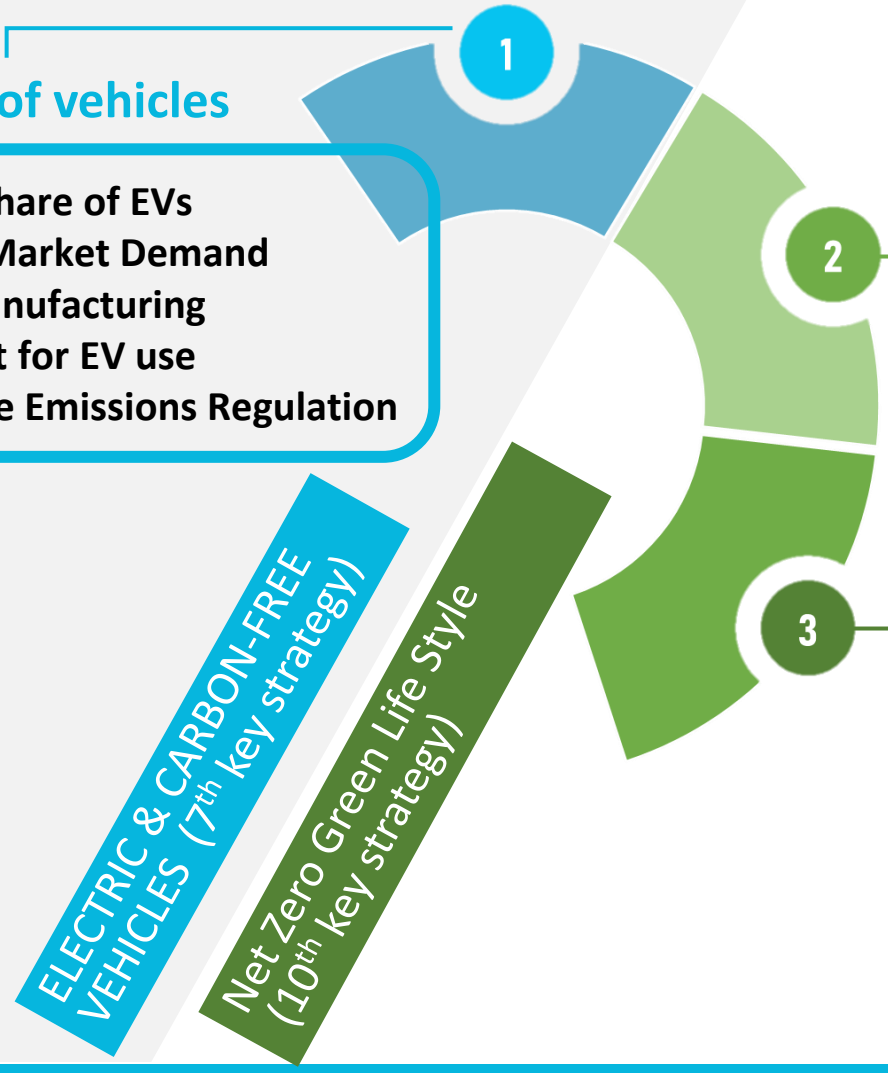
- Increase Market share of EVs
- Create Domestic Market Demand
- Localization of Manufacturing
- Build Environment for EV use
- Strengthen Vehicle Emissions Regulation

Human-Oriented Green Transport

- Public Transport
- Walking Environment
- Cycling Environment

Private Vehicle Management

- Low-carbon Zone, Parking management, Stop inap propriate fossil fuel subsidies
- Shared mobility



Auxiliary Strategies

- Urban Planning
- Promote Green Transport Lifestyle

Taiwan's Transportation Transition Strategy 2/2

ELECTRIC & CARBON-FREE VEHICLES (7th key strategy)

Focus on EV technology, promotion of EVs and improvement of EV use environment as well as policy, strategies and targets

Net Zero Green Life Style (10th key strategy)

Focus on behaviour change toward to low-carbon transport by means of encouragement, building environment and guidance of life style.

The two strategies are closely related, and some specific actions are complementary

NOTE:
To guide people to change their behaviour to adopt Low-Carbon vehicles, the MOTC leads the 7th Key Strategy "Electric & carbon-free Vehicles" as well as the "Mobility: Low-Carbon Transport" in the 10th Key Strategy "Net Zero Green Life", which whereas is integrated and dominated by the EPA.

Electric & Carbon-free Vehicles

Targets and Strategies

ELECTRIC & CARBON-FREE VEHICLES

Target of EV Adoption

TAIWAN 2050 Net Zero Transition

12 key strategic plan

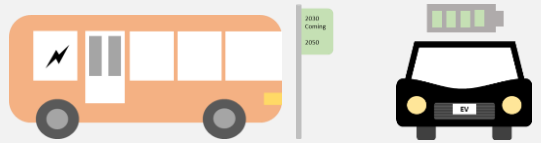
Target to have both EV and electric scooter sales to achieve a 100% market share by 2040.

- Build a friendly environment for EVs to benefit the popularization of EVs and therefore achieve the goal of net zero emissions by 2050.

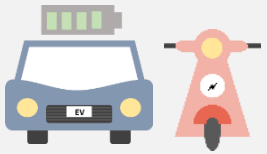
2050 Net Zero

Target of EV Adoption

2030 **City buses and government cars fully electrified**



2040 **Car and scooter sales fully electrified**



EV targets

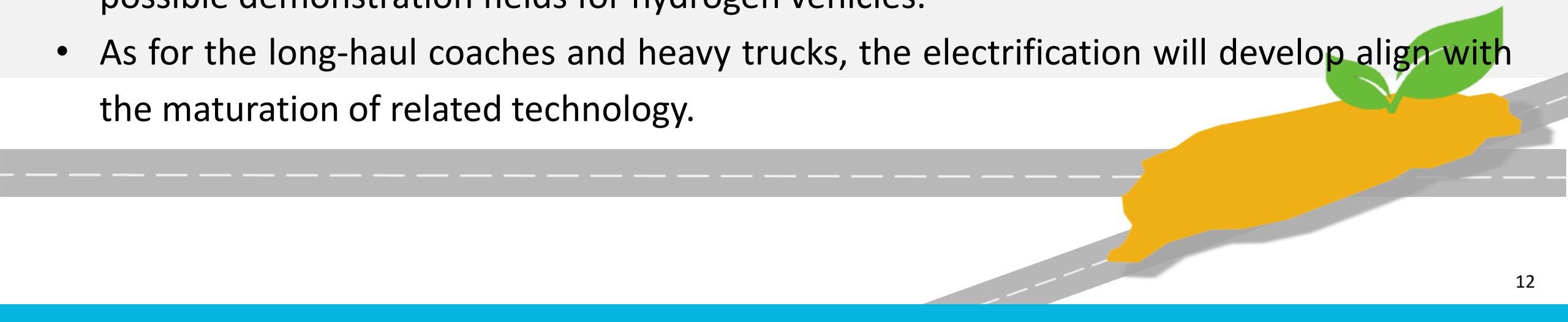
		2025	2030	2035	2040
E-bus	Total fleet	35%	100%		
E-govt. car	Total fleet		100%		
EV	Market share		30%	60%	100%
E-scooter	Market share		35%	70%	100%

EV status and targets

Vehicle type	Target item	Now	Target			
		2022	2025	2030	2035	2040
E-bus	% in fleet	10%	35%	100%		
	NO. of registration	1,170	4,600	11,700		
EV	% of market share	4.4%	10%	30%	60%	100%
	% in fleet	0.5%	1.4%	7.3%	20.3%	43.2%
	Annual sales	16,106	38,000	114,000	228,000	380,000
	NO. of registration	34,160	101,365	519,365	1,431,365	3,027,365
E-scooter	% of market share	11.9%	20%	35%	70%	100%
	% in fleet	4.4%	7.9%	16.7%	34.7%	63.3%
	Annual sales	87,690	180,000	315,000	630,000	900,000
	NO. of registration	630,223	1,131,438	2,376,138	4,896,138	8,856,138

Priority

- Prioritize mature technology, such as E-bus, EV and E-scooter.
- Deployment of public charging facilities and stations based on the EV targets.
- Promote transition and development of vehicle manufacturing and maintenance industries, with Balanced Urban and Rural Development.
- Adopt hydrogen fuel cells as future major option of carbon-free vehicles, evaluate the possible demonstration fields for hydrogen vehicles.
- As for the long-haul coaches and heavy trucks, the electrification will develop align with the maturation of related technology.



Objectives

1 Increase adoption of EVs

Purchase subsidy to incentivize market demand for EVs. Amend vehicle regulations.

2 Complete EV environment

Deploy charging facilities and stations and provide friendly environment and incentives for the use of EVs.

3 Industrial technology upgrading and transition

Promote the upgrading and transition of relevant industrial technologies. Encourage local key components manufacture.

Roadmap and Action Plans

ELECTRIC & CARBON-FREE VEHICLES

EV roadmap

3 Objectives	10 pathways		
1 Increase adoption of EVs	Increase adoption	1-1 Adoption incentives and demonstration	E-BUS; EV; E-SCOOTER; E-Truck; OTHERS
	Amend vehicle regulations	1-2 Vehicle Import Regulations	
		1-3 Enhance emissions regulations and mechanism	
		1-4 Tax and fee reduction and financial support	
2 Complete EV environment	Expand charging facilities	2-1 Increase charging facilities	Public; Private
	provide friendly environment and incentives	2-2 Spec. for Charging Facilities	
		2-3 Auxiliary measure for electricity	
3 Industrial technology upgrading and transition	Upgrading and transition of industrial technologies	3-1 R&D on key components and upgrading of industrial technology	
		3-2 Technical staff transition	
		3-3 Govt. owned business transition	

57 action plans conduct by multiple ministries

EV pathway

1

1 Increase adoption of EVs

Increase the overall number of EVs by subsidizing the purchase of electric vehicles and provide a supporting environment suitable for the use of EVs by adjusting vehicle-related regulations and mechanisms. Under this goal, 4 pathways are drawn up for the above-mentioned aspects, with 2030 as the phased goal, the MOTC will be the mainstay, and the MOEA and other 5 ministries will cooperate to launch a total of 25 action plans.

Hardware environment improvement
Accelerate the increase in the number of EVs

- **1-1** Increase adoption and demonstration

Adjust vehicle-related regulation and mechanism
Optimize the supporting incentives of relevant rules to promote the willingness of society to EVs

- **1-2** Vehicle Import Regulations
- **1-3** Enhance emissions regulations and mechanism
- **1-4** Tax and fee reduction and financial support

EV pathway

1

1-1 Adoption incentives

E-BUS

- 交 ALL city buses electrified by 2030
- 交 Stop diesel bus subsidies
- 交 Electrification of cummuting buses

E-SCOOTER

- 交 Delivery scooter electrified.
- 交 Postal scooter electrified.
- 經 Subsidize purchase of e-scooters.

OTHER

- 交 Inland E-ships and airport ground EVs.
- 交 EV Demonstration in Orchid Island and Rural areas
- 交 Hydrogen Vehicle Demonstration Project.

EV

- 主 Review the budget for replacing official vehicles with EV vehicles
- 交 Changing taxis into smart EV cars

E-TRUCK

- 經 R&D Subsidy for EV in logistics and transportation

EV pathway

1

1-2 Vehicle Import Regulations

Encourage domestic automakers and dealers to manufacture or import low-carbon vehicles such as EVs through regulation amendment

- 交 Amend Vehicle Safety Type Approval Management Regulations
- 環 Set GHG emission performance standard (EPS)
- 經 Amend Fuel Economy Standards and Regulations on Vehicle Inspection and Administration

1-3 Enhance emissions regulations and mechanism

Disclosure information to guide people to adopt low carbon vehicles and transportation

- 環 Sed GHG Offset Project for EVs
- 環 Set GHG emissions information disclosure platform
- 交 Create a low carbon transportation environment and create a field of low energy consumption

EV pathway

1

1-4 Tax and fee reduction and financial support

By means of financial favors or assistance to lower the threshold for users to replace electric vehicles

- 財 Exemption from excise tax and license tax
- 交 Exemption from automobile fuel charge
- 地 Parking fee discount for EVs
- 金 E-bus preferential loans

EV pathway 2

2 Complete EV environment

While increasing the number of EVs, the energy supplement problem of EVs must be solved. In addition to the specific addition of charging facilities, this goal also improves the popularity of charging facilities by optimizing relevant regulations on charging facilities and lowers the threshold for switching to EVs. Under this goal, a total of 3 pathways and 19 action plans are drawn up.

Hardware environment improvement
Accelerate the network deployment of charging facilities

2-1 **Increase charging facilities**

Provide friendly charging facilities
Optimize incentives and regulations
Strengthen the network accessibility of charging facilities

2-2 **Specifications for Charging Facilities**

2-3 **Auxiliary measure for electricity**

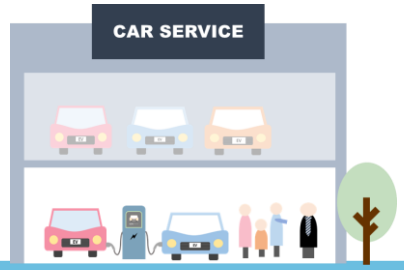
EV pathway 2

2-1 Increase charging facilities

Public parking lots and terminals

Subsidizing local governments and subordinate agencies to build public charging facilities

交 環



EV distribution and maintenance system

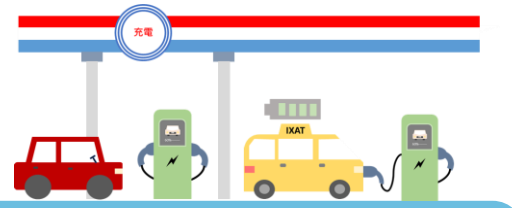
Encourage EV dealers to continuously build charging facilities to match the growth of vehicles

交

Commercial facilities and science park

Build charging facilities at commercial and industrial sites, technology industrial parks and scenic spots

經 科



State-owned enterprise area

Transformation of state-owned enterprises such as gas stations

經

EV pathway

2

Principles of Location Selection for Charging Facilities Construction of Transportation Nodes

Areas where private operators are willing to invest in the operation are given priority to construction. As for public areas where private operators are less willing to invest or lack of economic scale benefit, the MOTC could subsidize local governments to build.

According to the EV target by county/city in 2025, the deployment number of fast and slow chargers are estimated. Local governments are requested to plan appropriate charging facilities according to the deployment and consider the following first:

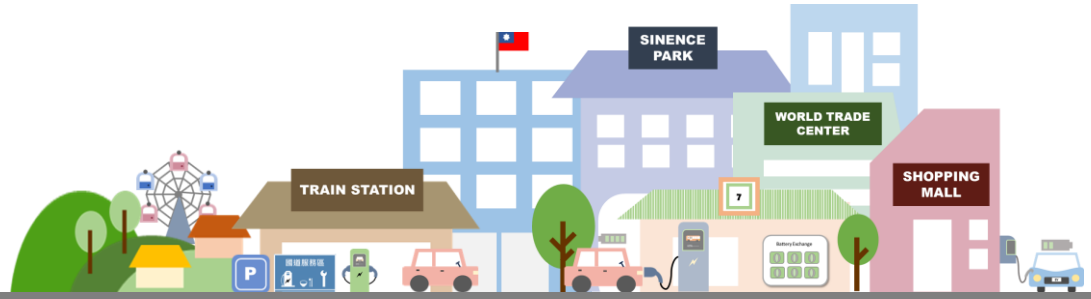
(1) Transportation nodes (including adjacent areas)

(2) Popular sightseeing attraction areas

(3) Intensive commercial area

(4) Appropriate locations along the highway

(5) Taking into account the balance of urban and rural



EV pathway 2

2-2 Specifications for Charging Facilities

Setting standards for charging facilities and adjusting building-related regulations to promote the popularization of charging facilities

- 內 Amendments to the Condominium Administration Act Building Administration Division for the Installation of Charging Facilities
- 內 Charging facilities listed as green building label evaluation items
- 交 Establishment of data sharing standards for charging facilities
- 經 Amendments to the EV charging system chapter of the Regulations on Consumer Electrical Equipment Installation
- 經 Promote and improve the standards, testing and verification environment for EV charging facilities

2-3 Auxiliary measure for electricity

Set up a single window for the application of charging facilities installation and electricity use to facilitate private installation of charging facilities

- 經 Formulate a special electricity price plan for EVs
- 經 Set up a single window for grid distribution applications for charging facilities
- 經 Promote smart charging demonstration projects

EV pathway 3

3 Industrial technology upgrading and transition

By upgrading and transformation of the knowledge and ability of technical personnel in related industries of transportation, to develop local EV industries of production, manufacturing and maintenance in Taiwan, as well as the creation of emerging technology. Under the goal of "Industrial Technology Upgrading and Transition", a total of 3 pathways and 13 action plans were formulated for the above aspects.

Technology R&D	**3-1**	**R&D on key components and upgrading of industrial technology**
Industrial Transition Support	**3-2**	**Technical staff transition**
	3-3	**Government owned business transition**

EV pathway 3

3-1 R&D on key components and upgrading of industrial technology

經 環 Key sub-systems of EVs, smart e-bus DMIT (designed and manufactured in Taiwan), AI smart charging technology, low-cost DC charging equipment and other technical product development, small-scale trial production of lithium metal solid-state batteries, and battery replacement and recycling use.

3-2 Technical staff transition

3-3 Government owned business transition

交 勞 Technical transition training for personnel of automobile and scooter maintenance and inspection.

經 Taipower provides charging and battary swapping services

經 CNPC gas stations transformed into low-carbon energy supply service stations

Key Performance Indicators and Benefit

ELECTRIC & CARBON-FREE VEHICLES

Expected benefit by 2030

1 Increase adoption of EVs

Replacing 11,700 city buses and all city buses electrified

The DGBAS amend the purchase specifications of government cars to be electrified

50% of postal scooter electrified

Subsidize purchase of 500,000 electric motorcycles

Subsidize 500 electric taxis

Encourage domestic OEMs to invest in 2 new logistics models on building prototypes, system integration, testing and verification

2 Complete EV environment

The MOTC invests in public charging to build up to 6,000 slow charger and 500 fast charger

The EPA subsidizes local governments to build 400 EV energy supplement sites

The MOEA promotes commercial facilities, industrial parks, state-owned enterprises, etc. to cooperate with private manufacturers to set up up to 365 slow chargers and 302 fast chargers

The NSC encourages new entrants in the Science Park to install charging facilities for at least 2% of the number of parking spaces when building their own parking lots

3 Industrial technology upgrading and transition

Professional technology transformation training for 5,760 auto repair technicians; professional technology transformation training for 960 auto inspectors

1,000 person-times of training related to EV maintenance

Subsidized and coached 16,000 motorcycle shops

Domestic EVs will be on the road in 2024, and the market share will reach 15%

EV CO_2 reduction by 2030

- Subsidize the purchase of EVs, drive market demand for EVs and related industries, and increase EVs adoption
- Adjust vehicle-related management regulations and mechanisms, and provide a supporting environment suitable for the use of EVs
- Optimize charging facilities and tax and fee, increase the popularity of charging facilities, and strengthen the incentives to replace fuel vehicles with EVs
- Upgrade and transform the knowledge and skills of technical personnel in related industries, cultivate and develop Taiwan's local EV manufacturing and emerging technology capabilities

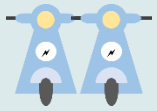
CITY BUS

Replacing 11,700 city buses and electrifying all city buses, with an estimated CO_2 reduction of 403,000 metric tons per year

CAR

An increase of 510,000 cars compared with 2020; the market share of EVs reaches 30%, and the estimated CO_2 reduction is 741,000 metric tons per year

SCOOTER



An increase of 1.92 million scooters compared with 2020; the market share of e-scooter reaches 35%, and the estimated CO_2 reduction is 584,000 metric tons per year

Just Transition Assessment

ELECTRIC & CARBON-FREE VEHICLES

Just Transition Assessment -Impacts

Labour

Practitioners in the existing maintenance system may lack experience and technology in EV maintenance.
Livelihoods affected as fuel vehicles are gradually phased out.

Industry

Automobile manufacturing and parts-related industries need to shift product targets, but the development of new technologies for electrification and decarbonization requires a lot of resource investment.

Local

It is difficult for rural finance to replace fuel vehicles at one time; the geographical environment of each district is different, and the performance of existing EVs does not meet the needs of use.

Living

The price of EVs is high, and the promotion process may lead to gentrification of vehicle ownership and affect the rights of the public to travel. In addition, the public is also concerned about whether there are enough places for energy supplementation of Evs.

Just Transition Assessment -measures

Labour

Cooperate with education and training and other training programs to assist employees in the transformation of their technical capabilities and to integrate with the development of electrification of transportation.

Action plan

3-2-1 3-2-2 3-2-3 3-2-4

Industry

Counseling and subsidizing industries related to electrification and decarbonization technology R&D upgrades and transformation of existing industries

Action plan

3-1-1 3-1-2 3-1-3 3-1-4 3-1-5 3-1-6 3-1-7

Local

Taking into account the particularity of the transformation of rural transport vehicles; and with the improvement of vehicle technology, look for low-carbon transport suitable for the local area to import

Action plan

1-1-10 1-1-11

Living

Create a friendly environment for the electrification of transport, provide incentives such as subsidies, and lower the threshold for people to switch to electric transport

Action plan

1-1-9 1-4-1 1-4-2 1-4-3 1-4-4 2-1

Inter-ministerial Cooperation

Inter-ministerial Cooperation

1 Increase adoption of EVs

- The MOTC, the MOEA and the EPA have all put budgets and projects of increasing the number of EVs
- The DGBAS conducts a rolling review of the budget amount for govt. EVs
- The MOF, the MOTC, and the FSC assist in the adjustment of relevant regulations such as electric vehicle taxes and fees and industry loans

2 Complete EV environment

- The MOTC and the EPA invest in the construction of public charging facilities
- The NSC and agencies and state-owned enterprises under the MOEA invest in promoting cooperation with private organizations to set up charging facilities
- The MOI discusses the revision of the regulations on the installation of charging facilities in apartment buildings

3 Industrial technology upgrading and transition

- The MOEA invests in the promotion of advanced technology research and development and local manufacturing of the electric vehicle industry.
- The EPA conducts a battery recycling program.
- The MOEA, the MOTC, and the MOL invested in transformational education and training for car dealers and employees.

The end