經濟部能源局
Bureau of Energy,
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Energy Storage Promotion Strategies and Development in Chinese Taipei

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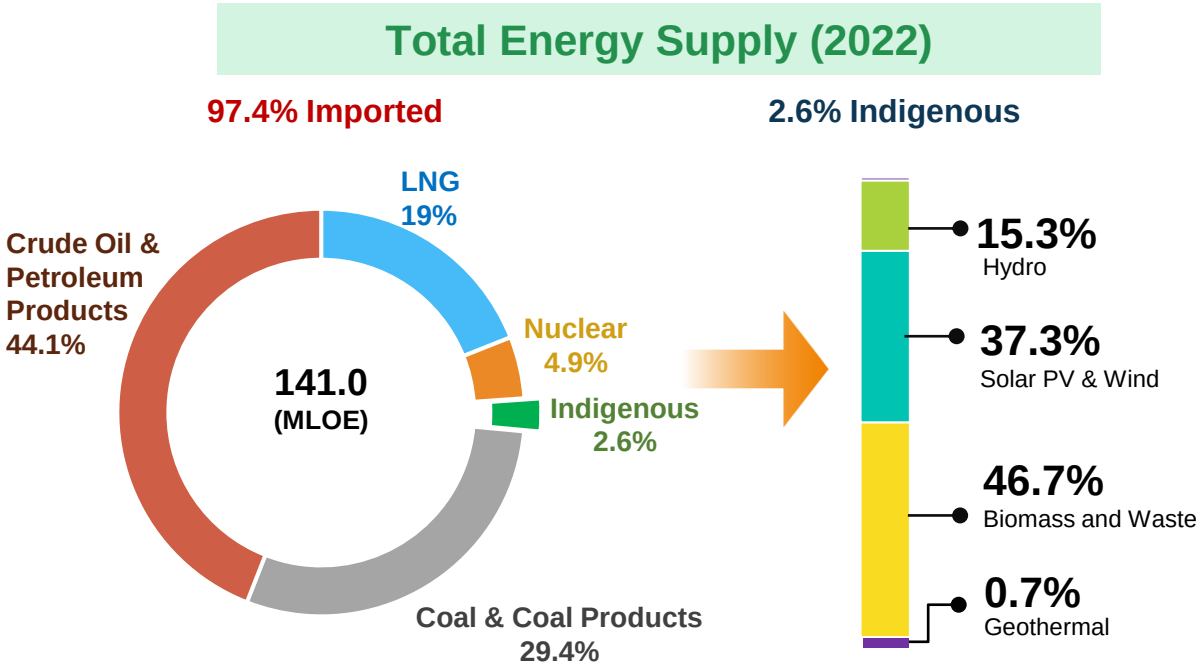
Outline

01 Energy Situation

Energy Mix Overview

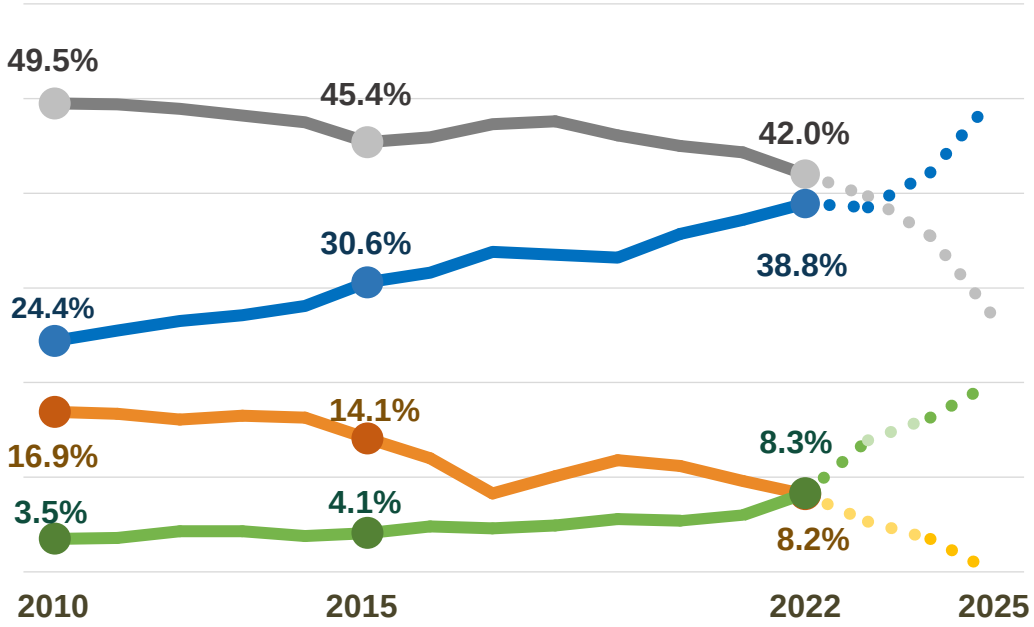
- As for the energy supply structure in 2022, the **imported** energy accounted for **97.4%**, and **fossil fuel** accounted for near **92.5%.**



Source：BoE (2023), Monthly Energy Statistics.

Energy Transition by 2025

- **Clear targets and pathways for the energy transition to increase green energy and reduce coal.**



LNG — Increase LNG-fired to 50%

Coal — Reduce Coal-fired to 30%

RE — Increase Renewables to 20%

Nuclear — Achieve Nuclear-free

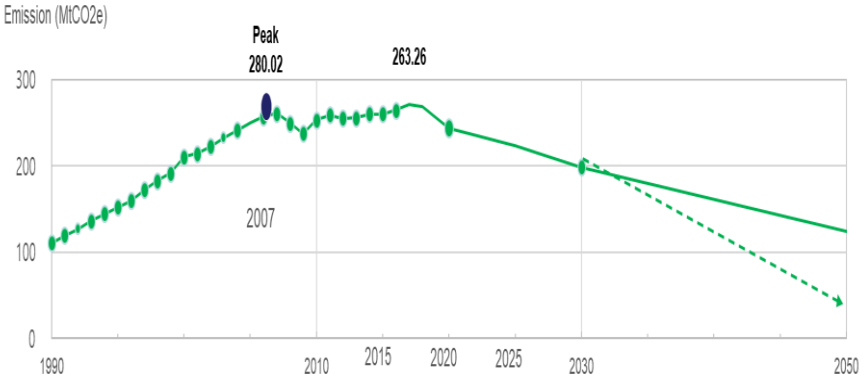
02 Net Zero Transition

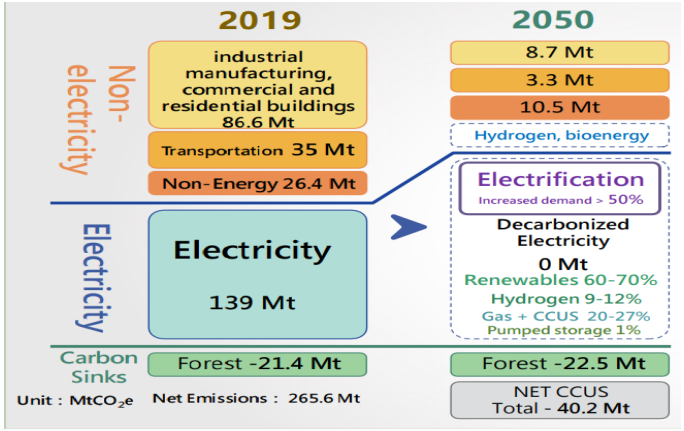
Net-Zero Emissions Policy

- **We are plotting a path to achieve net zero emissions by 2050!**

  Carbon reduction will prompt profound economic changes, whoever can take the lead in developing new technologies and creating new economic models will cement their status in a new global order.

- **Taiwan officially published "Taiwan's Pathway to Net-Zero Emissions in 2050" in March 2022.**





Net-Zero Emissions Strategy

- **Our net-zero transition advocates fundamental change across all sectors of society, 12 key strategies are proposed to achieve the net zero goal.**

- **4 Major Transition Strategies:**
  Energy Transition, Industrial Transition, Lifestyle Transition, and Social Transition

- **2 Governance Foundations**:
  Technology R&D and Climate Legislation

Source：NDC (2022), The Pathway to Net-Zero Emissions in 2050.

03 Current Status of Energy Storage

Current Status of Energy Storage

Pumped Storage Hydropower

- 2 plants in operation
- Total capacity: 2,602 MW
- Discharging capability: 4 to 6 hours

Battery Energy Storage System (Demonstration)

- 3 sites and 5 battery energy storage systems
- Total capacity: 7 MW

Battery Energy Storage System (Commercial operation)

- Taipower’s self-built projects: 41.6 MW
- Procuring ancillary services: 37.3 MW

Battery Energy Storage Demonstration

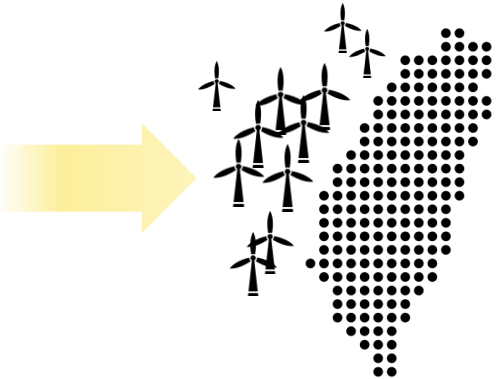
- **5** battery energy storage systems were completed, with **7 MW** installed capacity in total.

	1st site	2nd site	3rd site		
Location	Kaohsiung 	Taichung 	Changhua 		
RE installed capacity/ voltage grading	PV:4.64kWp/ 11.4kV	PV:6.49MWp WT : 2MW /22.8kV	PV：100MWp/23.9kV/161kV		
ESS installation	1MW/ 1.306MWh	1MW/ 1.286MWh	1.575MW/ 1.42MWh	1.870MW/ 1.681MWh	1.575MW/ 1.746MWh
Battery type	NCA/NCM (3.7V/60Ah)	NCA/NCM (3.6V/2.6Ah)	LFP (3.3V/18Ah)	NCA/NCM (3.7V/60Ah)	LFP (3.2V/15Ah)

Current Challenges

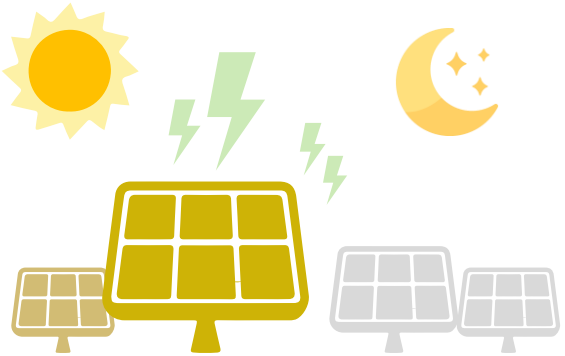
Grid integration

- Grid-connected capacity of hot spots are insufficient



Balance between supply and demand

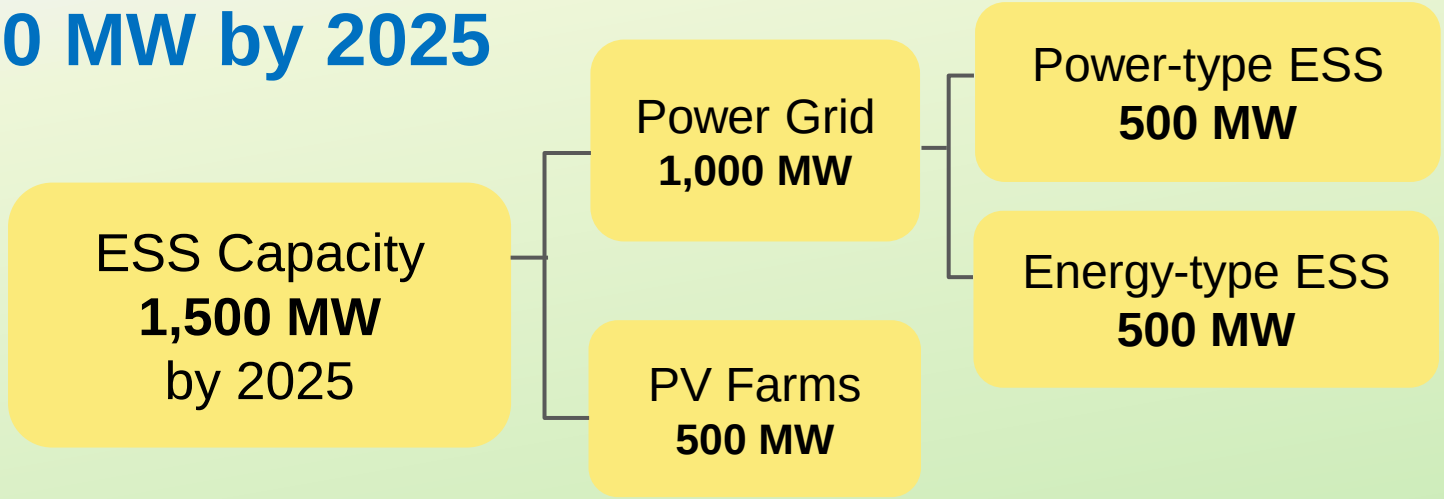
- Variable and intermittent renewable energy sources increase the difficulties of grid dispatch



04 Targets and Applications

Targets for Energy Storage

1,500 MW by 2025



5,500 MW by 2030

Grids
3,000 MW

+

Generators
2,500 MW

Energy Storage Applications

The applications of energy storage:

End-user application

- Provide backup power
- Enhance performance of demand response
- Increase PV Self-consumption

Power dispatch

- Regulation reserve
- Spinning reserve
- Voltage support
- Back start
- Electric energy dispatch

Power system

- Resource sufficiency
- Extend the lifetime of the power transmission and distribution system
- Mitigate the problem of power transmission congestion between regions

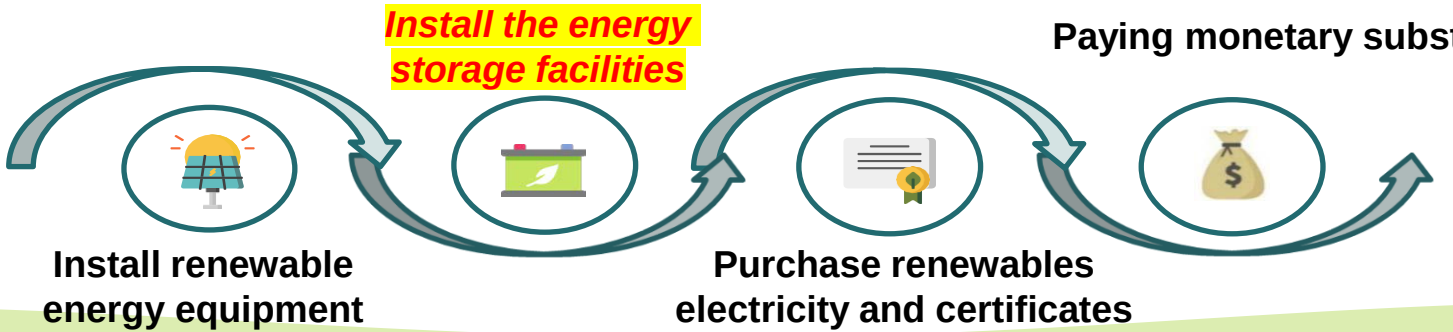
Strategies for Energy Storage

Power Trading Platform

- Energy storage system participates in Power Trading Platform, which was launched on 15 November 2021.
- The platform aims to attract grid investment in distributed electricity resources and create a sharing economy in electricity through auctions, as well as stabilize the nationwide power system.
- The ancillary service product items include regulation reserve, spinning reserve, and supplemental reserve, and AFC energy storage system primarily participates in regulation reserve.

Renewables obligations

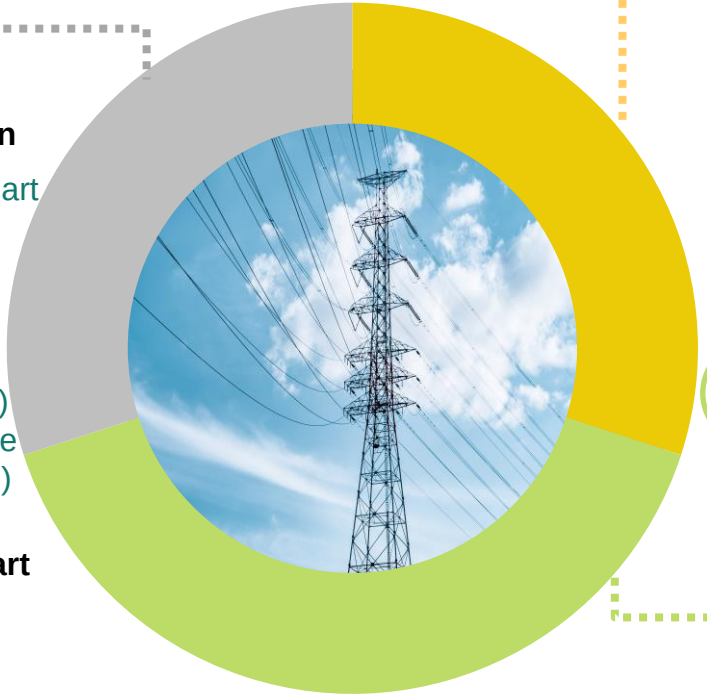
Big electricity users can perform renewable energy obligations through several approaches:



Strategies for Power System

Digitizing Power Grid

- **Promote power grid IC integration**
  - ○ Accelerate AMI deployment and smart substation installation
- **Refine regional power scheduling**
  - ○ Enhance the capability of Area Dispatch and Control Center (ADCC)
  - ○ Strengthen the capability of Distribute Dispatch and Control Center (DDCC)
- **Formulate/revise standards of smart grids**
  - ○ Standards on the safety of energy storage systems, smart grid, power dispatch management, etc.



Grid Infrastructure

- **Increasing grid-connected capacity of renewable energy**
- **Reduce transmission problems between regional grids**
- **Introduce power quality control equipment for power system stability**

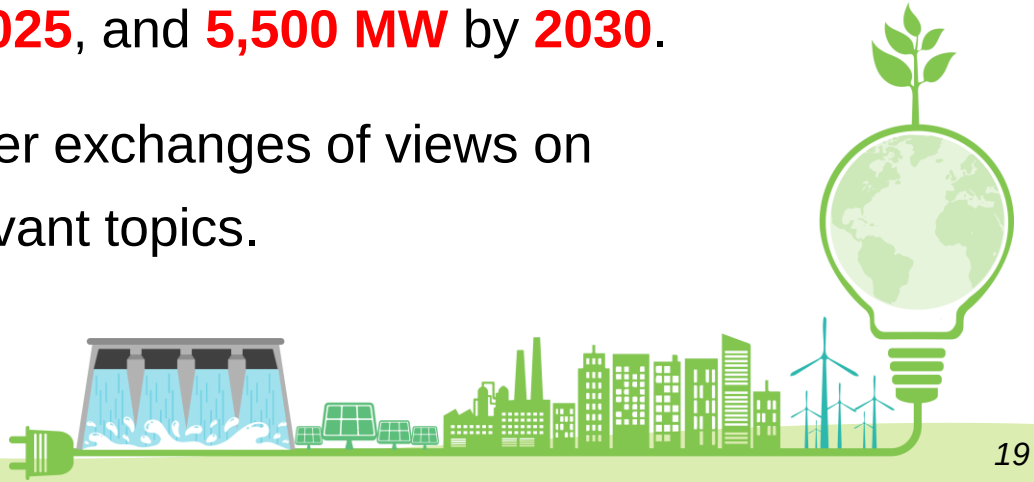
Improve the capability of system resource control

- **Improve responsiveness of conventional plants**
- **ESS Application**
- **Monitor renewables generation**
- **Expand electricity market**
- **Improve demand response management measures**

05 Conclusion

Conclusion

- The higher penetration rate of **renewable energy**, the installation of **energy storage systems** are needed to **stabilize grid** and **power supply** during peak hours.
- The targets for energy storage have been set to achieve **1,500 MW** by **2025**, and **5,500 MW** by **2030**.
- We look forward to further exchanges of views on energy storage and relevant topics.



Thank You

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