



Taiwan's Efforts to Net-zero Emissions in 2050

Dr. Yi-Hua Wu

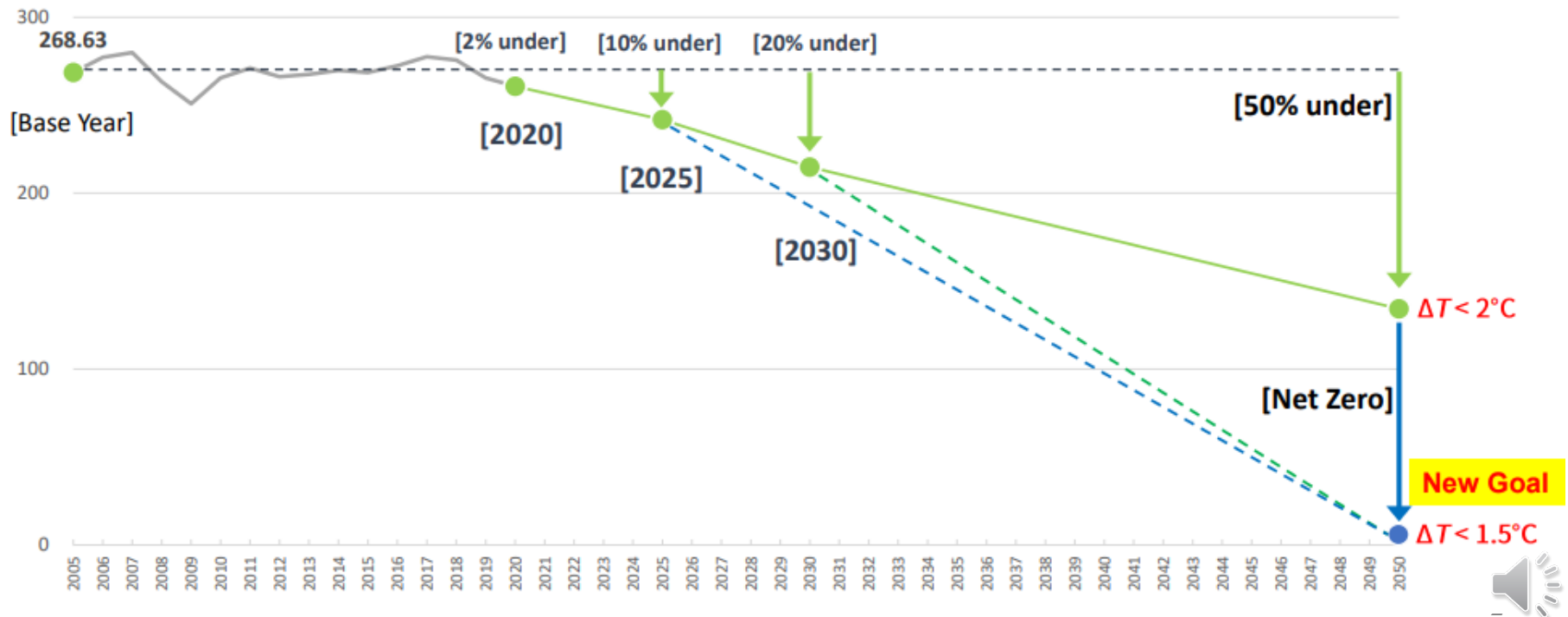
August, 2023



The net zero emission target of Taiwan

- In 2022, the Government of Taiwan announced the net zero target

Million tonne of CO₂e

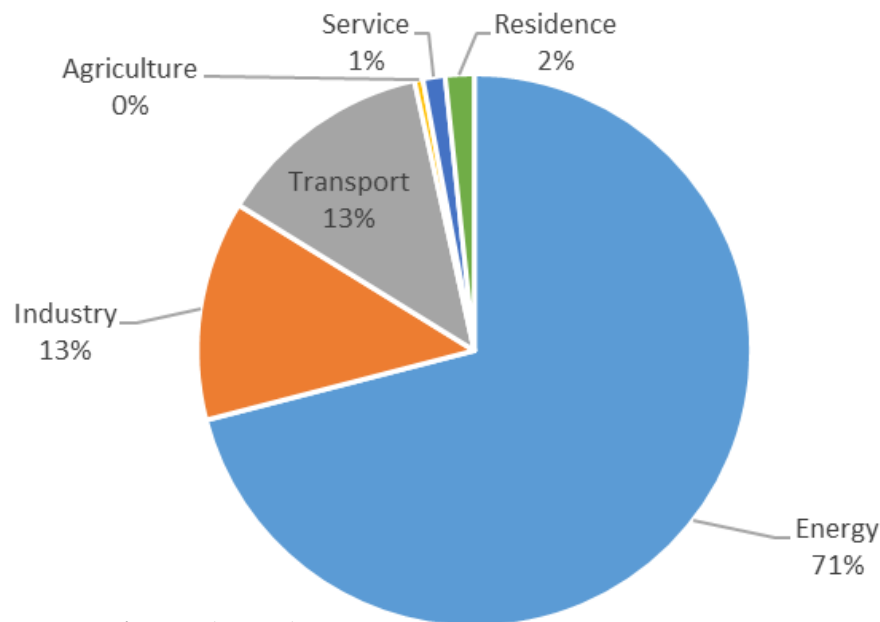


Source: National Development Council (2022)

Clean electricity supply is essential to achieve the target

- Energy sector contributes **71%** of greenhouse gas (GHG) emissions: Around **50%** of total emissions come from electricity
- The **decarbonization** of **electricity** can speed up the zero-target

Total GHG emissions in Taiwan



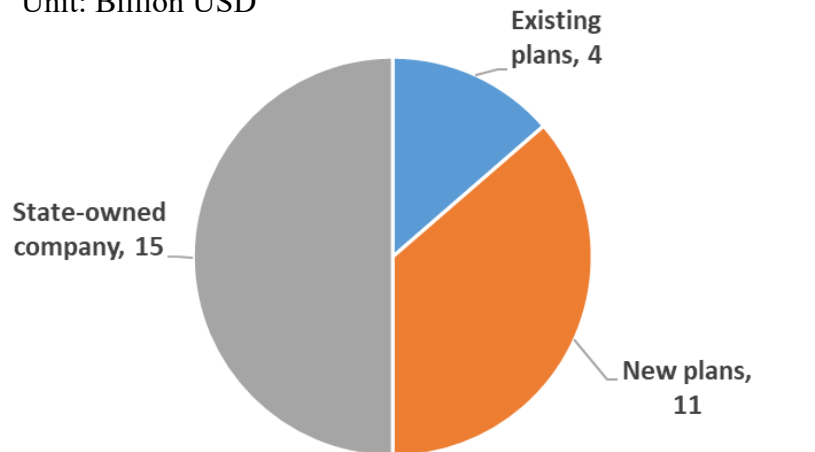
Source: Bureau of Energy, Taiwan (2023)

The budget and project plans by 2030

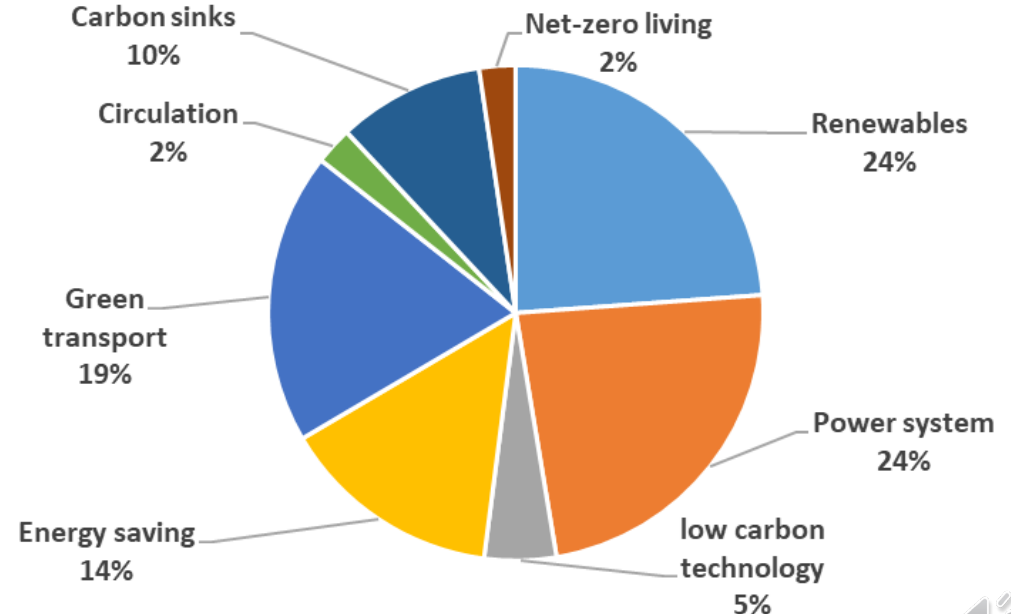
- Total budget of **30 billion** USD by **2030**: **15** billions of new fundings are provided by **state-owned companies** while **11** billions are offered by government
- By project fields: Power supply are major (**renewables** and **power system**) are major (**48%**) of budget. Green transport (**19%**) and energy saving (**14%**) follow

Budget source

Unit: Billion USD



Project fields



Synthesis measures for net-zero

Energy

- Green power
- Energy system resilience

Industry

- Production improvement
- Fuel switch
- Circular economy

Lifestyle

- Green transport
- Green building
- Dialogue with citizens

Society

- Balance conflicts and benefits

Technology R&D

- Circularity
- Low carbon
- Sustainable energy
- Carbon negative (CCS)

Climate legislation

- Review and amend current regulations or laws

A new office to implement the net-zero target

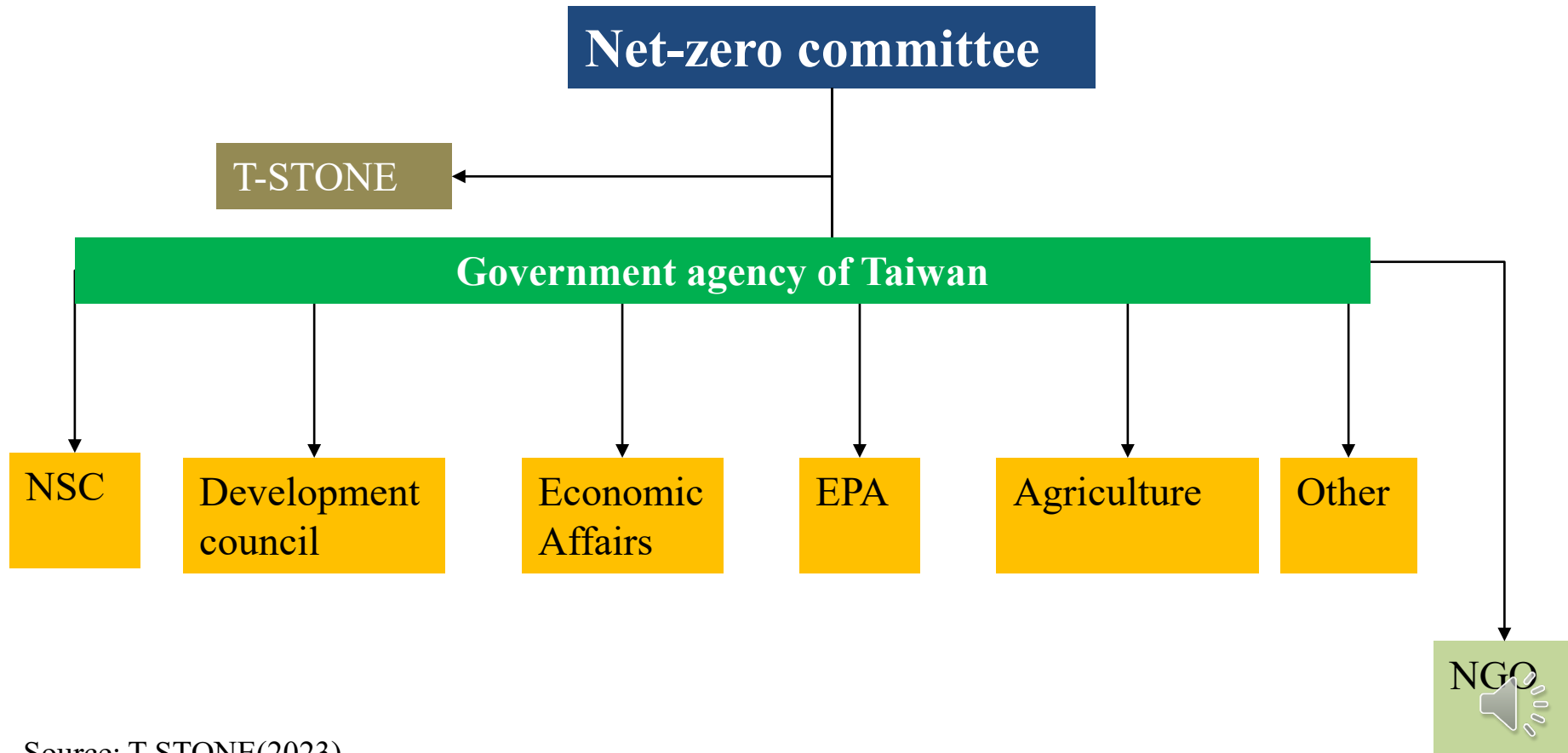
- Launched in May, 2023
- Taiwan Science and Technology Office for Net-zero Emission (**T-STONE**)



An office to implement the net-zero target

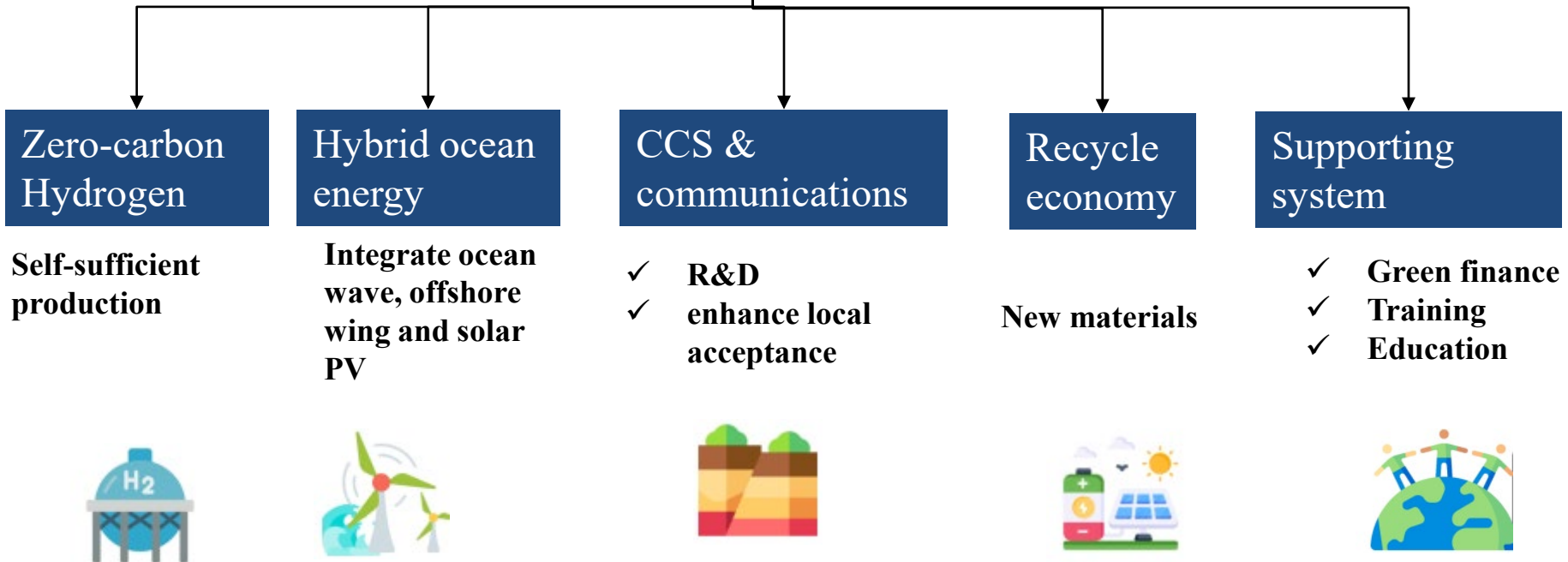
Purposes

- Policy design
- Supervise net-zero projects
- Communication with the public



Key policy designs for the past 4 months

Key suggestions for net-zero



Previous target for 2050

➤ Limitations:

- ✓ No adjustment of **electricity price**
- ✓ No adjustment of **industrial activities**
- ✓ No reveal the **carbon price information**

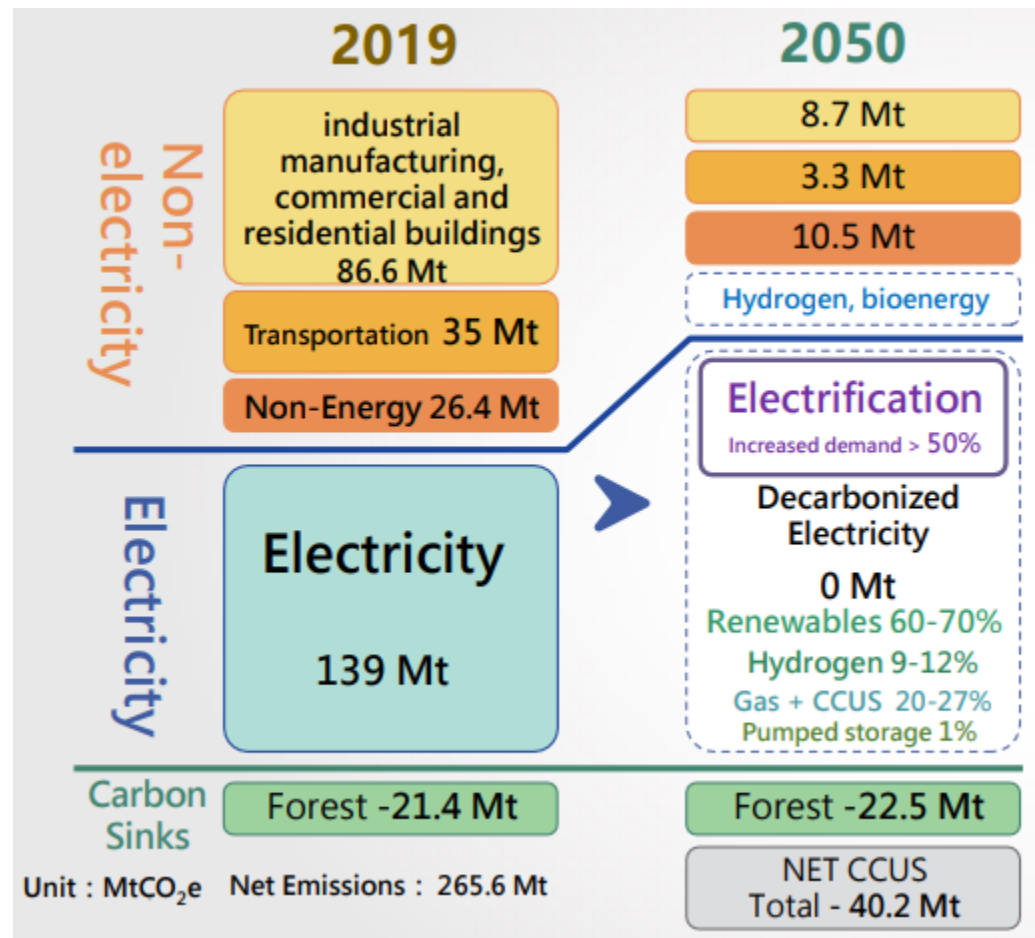
➤ 2050 power supply mix

- ✓ Renewables **60-70%**
- ✓ Hydrogen: **9-12%**
- ✓ Gas+CCUS: **20-27%**

➤ Emissions reductions in other sectors

- ✓ Industry: 8.7 million tonne (Mt)
- ✓ Transport: 3.3 Mt
- ✓ Non-Energy use: 10.5 Mt.

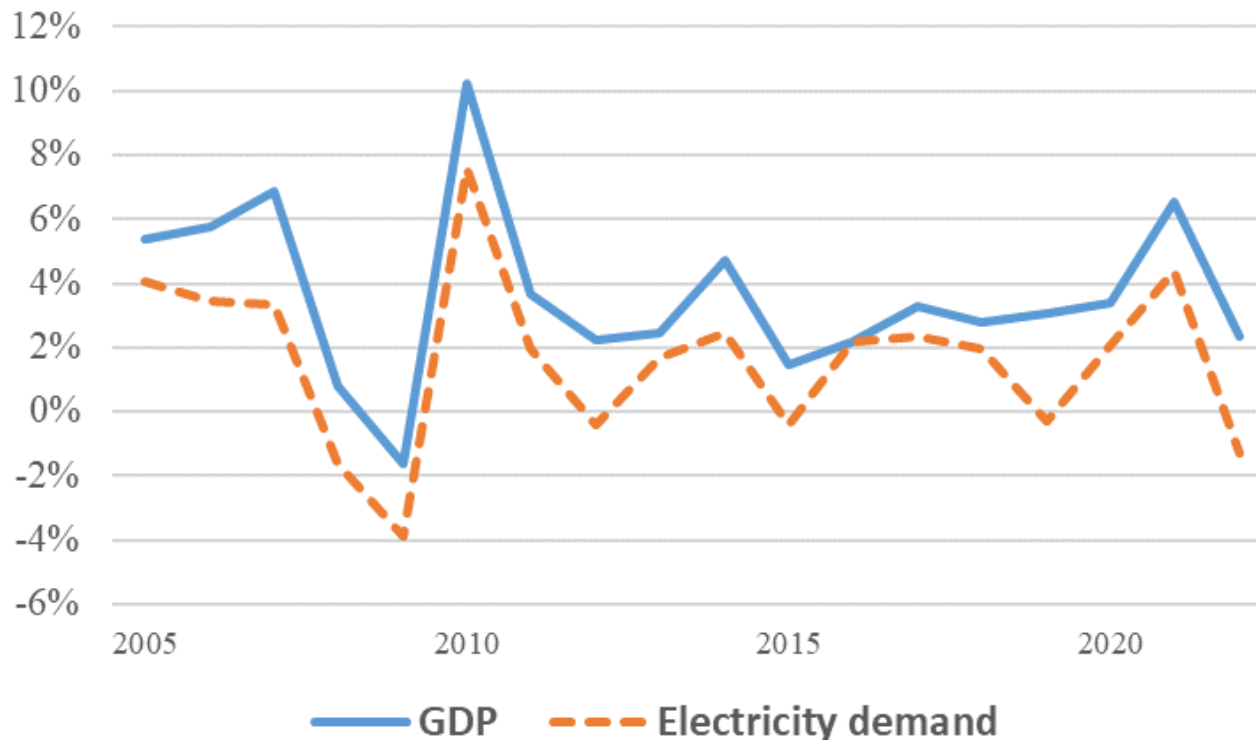
Evaluated by Taiwan TIMES model (ITRI)



Economy mainly drives electricity demand

- Taiwan's GDP growth closely relates to electricity demand growth: the **correlation coefficient** from 2005 to 2022 is **0.92**
- We **must** consider the **interaction** between economy and energy through an integrated model

Electricity demand and GDP growth



Future extensions: Hybrid models for Taiwan

- Integrate the power supply model of Dr. Ashina and AIM/CGE for Taiwan
- Revisit the net-zero emission pathway of Taiwan

Taiwan's power supply model

(under construction by Dr. Ashina of AIM)

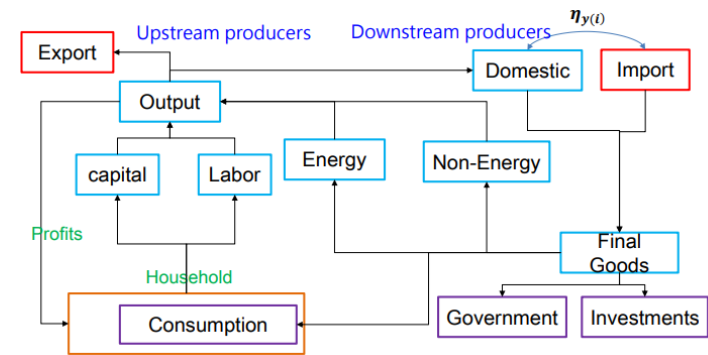


AIM/CGE for Taiwan

(Long term cooperation with AIM)

Electricity price

Economic impacts



Conclusions and future plans

➤ Taiwan must **commit** to the net-zero target

➤ The new office, **T-STONE**, is making progresses for the design of zero-emission pathway

➤ A **hybrid model** (Power supply and CGE) will evaluate the new net-zero pathway for Taiwan

Thank you very much
Look forward to seeing you guys next year

