



Bureau of Energy
Ministry of Economic Affairs



EGNRET 55 & EGEEC 56 Joint Meeting

Energy Development in Chinese Taipei

Dr. Chung-Hsien CHEN
Director, Energy Technology Division
Bureau of Energy, Ministry of Economic Affairs

13 May 2021

Contents

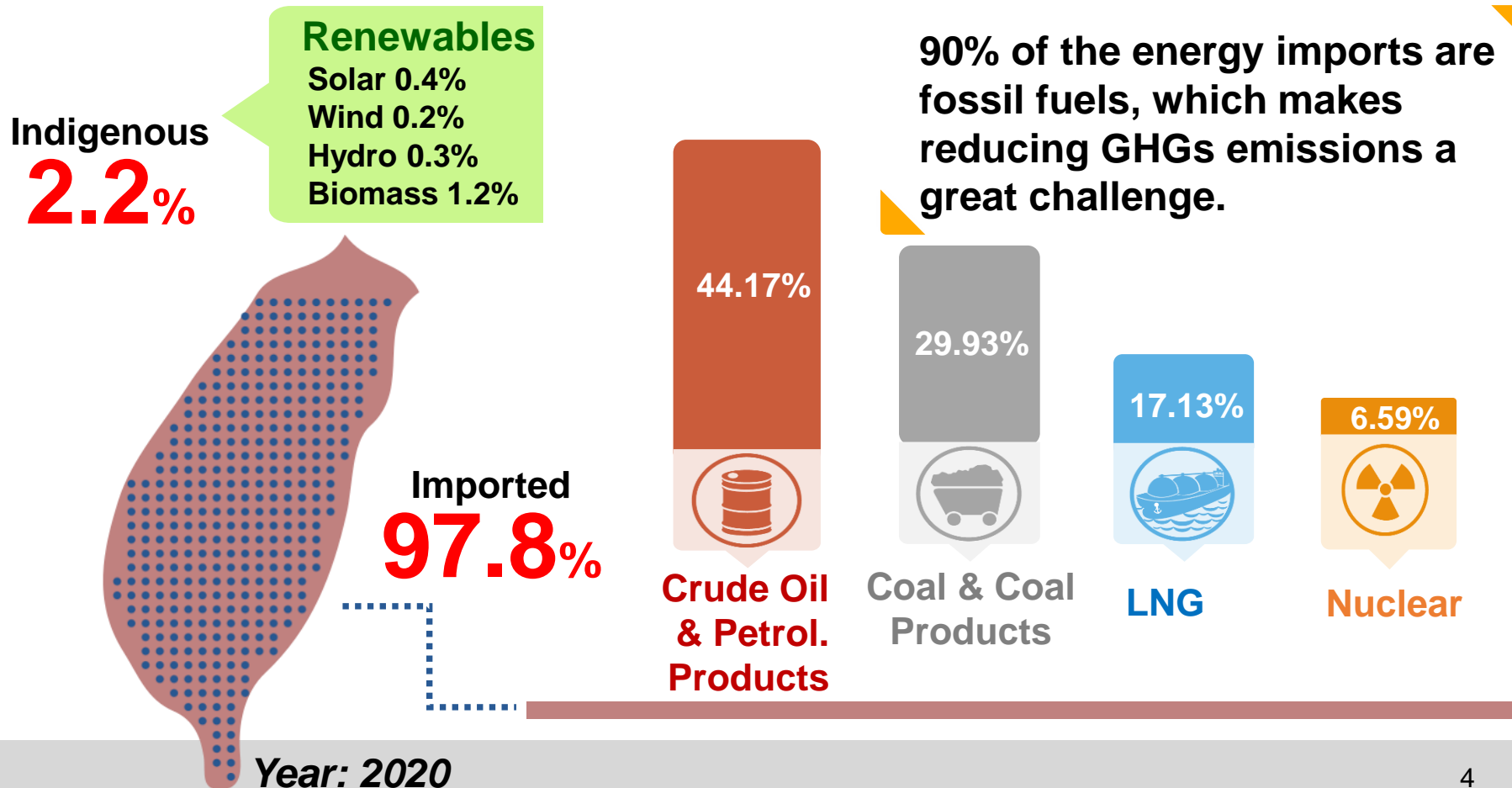
- I. Energy Situation
- II. Energy Transition
- III. Renewable Energy Development
- IV. Energy Efficiency and Conservation
- V. Conclusion

I. Energy Situation



Energy Supply

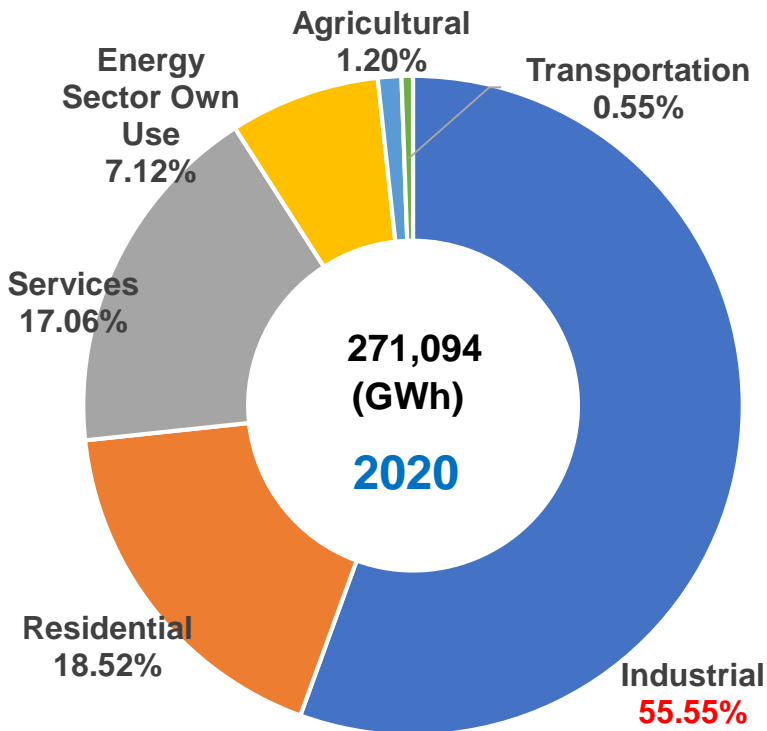
As nearly 98% of Chinese Taipei's energy depends on imports and isolated power systems, it is important to improve energy self-sufficiency.



Energy Consumption

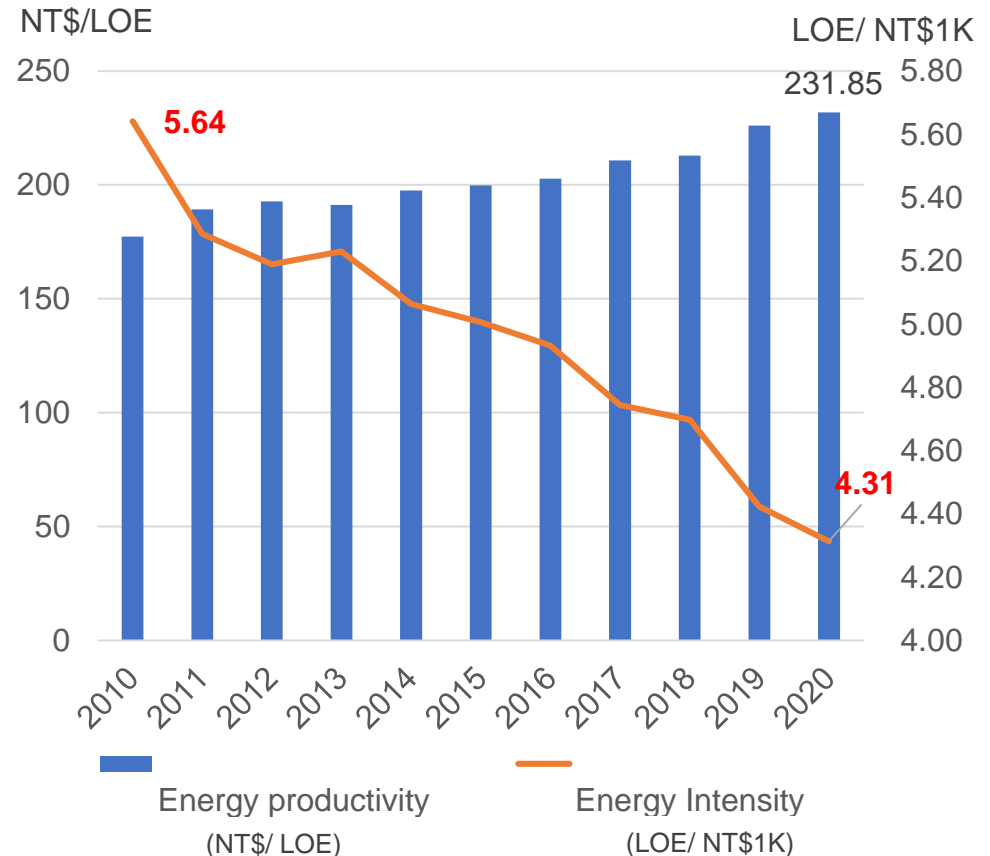
Industrial sector accounts for the largest share of electricity consumption at 55.55% in 2020.

Electricity Consumption (By Sector)



The energy intensity has reduced 24% from the last ten years.

Energy Productivity and Energy Intensity

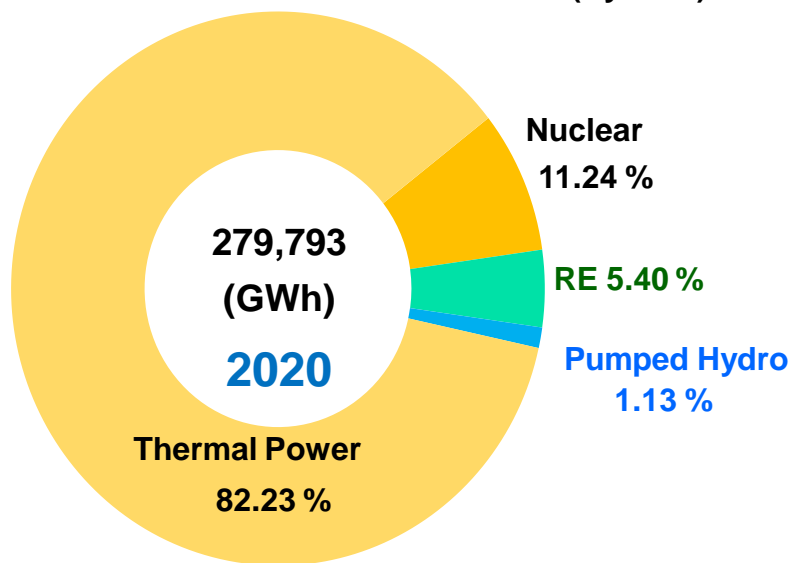


Energy Structure and Power Company

- Thermal power accounts for the largest share (82.23%) of electricity generation.
- The energy market is partially liberalized with 9 independent power producers up to date.

Structure of Electricity Generation

(By Fuel)



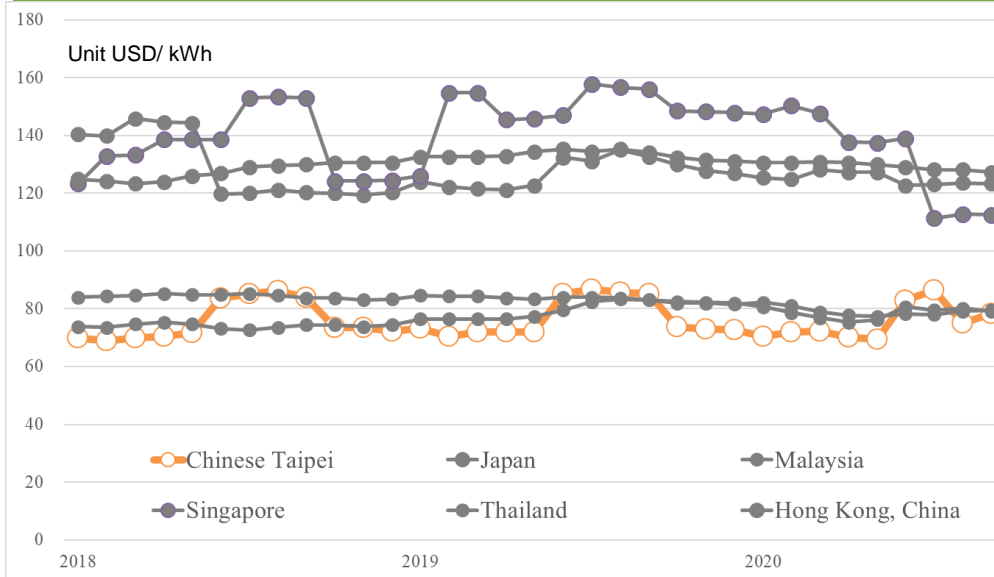
Nine Independent Power Plants in Chinese Taipei



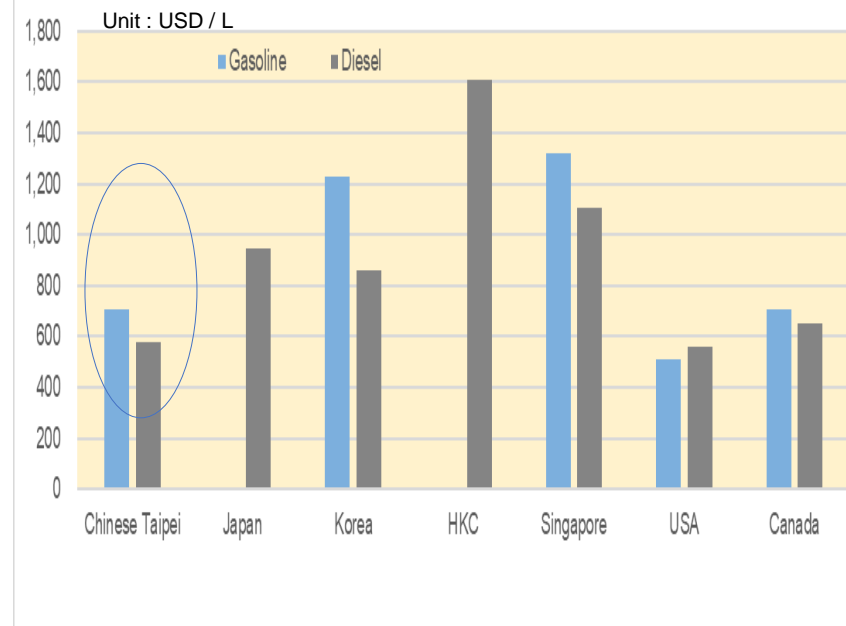
Energy Price

Electricity rates and retail gasoline and diesel prices in Chinese Taipei are relative **lower** compare with prices in APEC economies.

Residential Electricity Rates



Retail Gasoline and Diesel Price



II. Energy Transition



Energy Transition Objectives

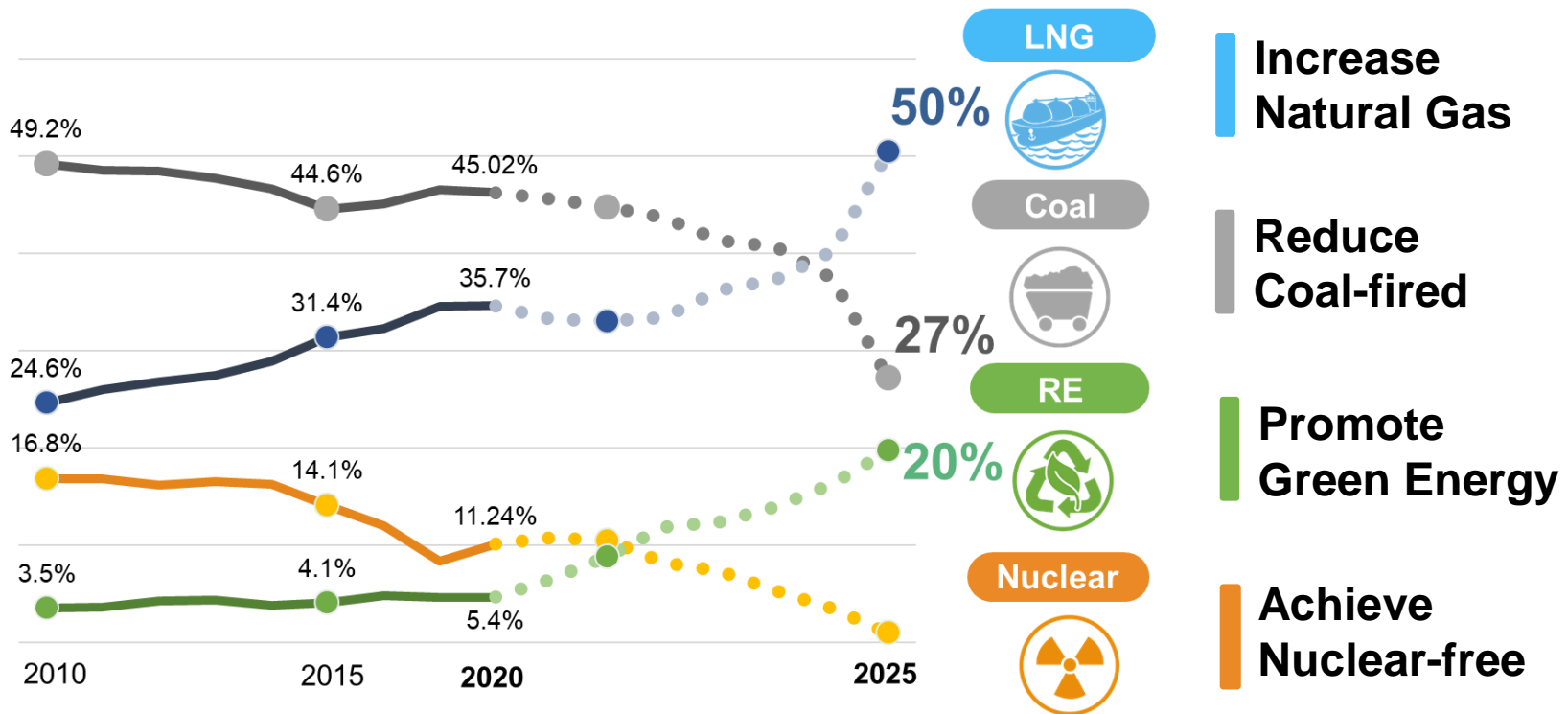
The government announcement to promote energy transition in May 2016.



Renewable Energy & Energy Saving : main pillars of the energy transition.

Energy Transition Pathway

There are clear targets and pathways for the energy transition in Chinese Taipei.



Increase Natural Gas/Reduce Coal-fired



- Add new low-carbon gas-fired units, about 12 GW by 2025.
- New/expanded LNG: 5 terminals total 26.2 Mt supply by 2025.



No new coal-fired power plants will be built before 2025 and will be replaced by gas-fired units after they are decommissioned.



46%
2019

high-efficiency ultra-supercritical power plants

27%
2025

III. Renewable Energy Development

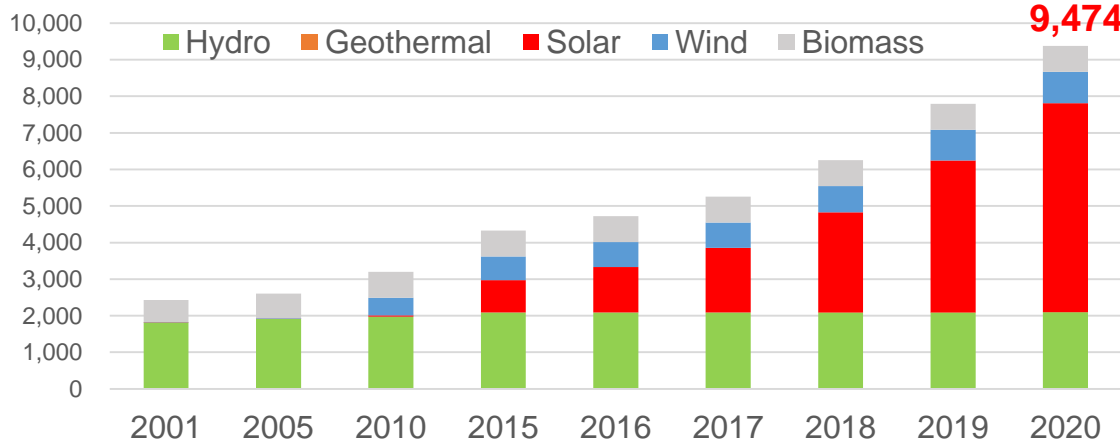


Renewable Energy Development

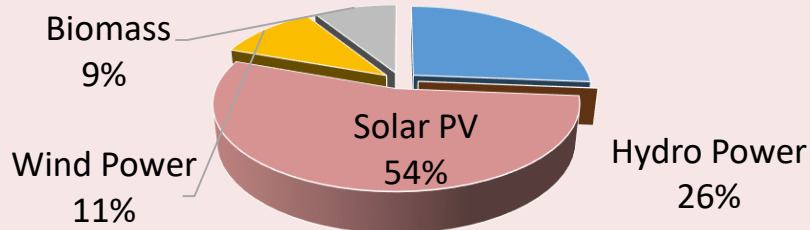
- The total installed capacity of renewable energy was **9,474 MW** by the end of **2020**.
- Renewable energy is the fastest-growing energy source in Chinese Taipei.
- The government has set the target of **20% renewable energy** generation by **2025**.

Share of RE Capacity between 2001 and 2020

Unit: MW



Share of RE Capacity in 2020

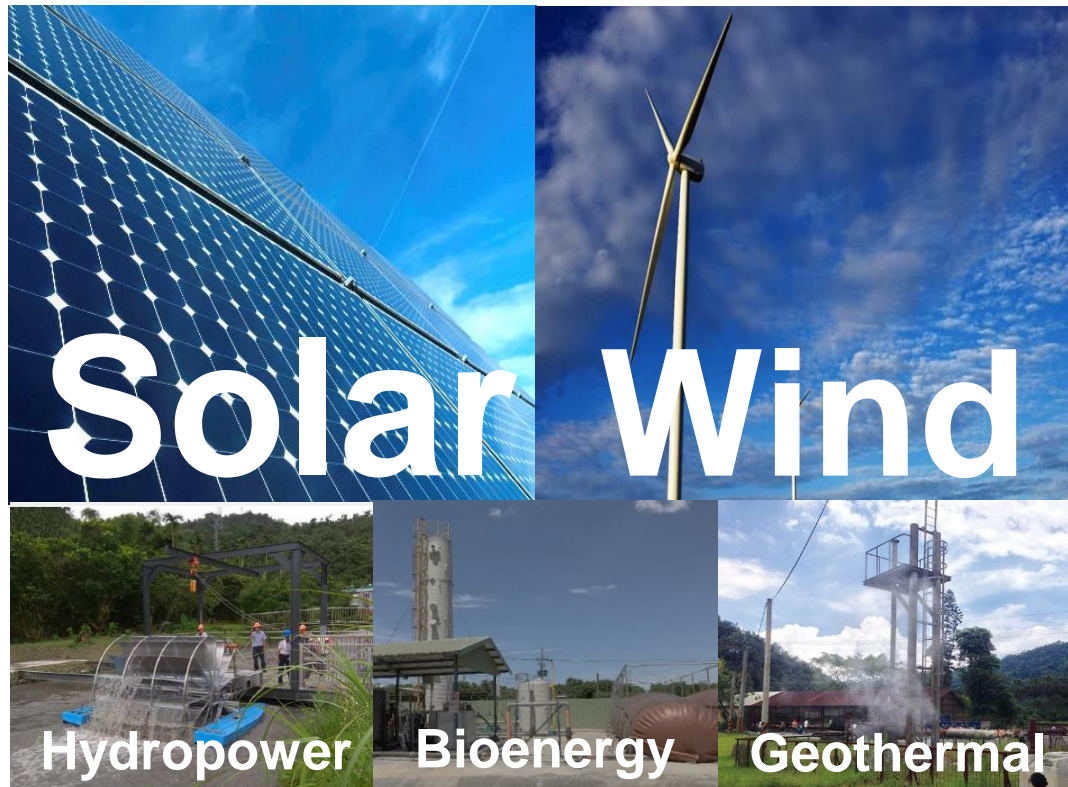


Renewable Energy Targets

| Power Capacity (MW) | | 2025(f) |
|---------------------|----------|---------------|
| Solar PV | | 20,000 |
| Wind | onshore | 1,200 |
| | offshore | 5,738 |
| Geothermal | | 200 |
| Biomass | | 813 |
| Hydro Power | | 2,150 |
| Fuel Cell | | 60 |
| Total | | 30,161 |

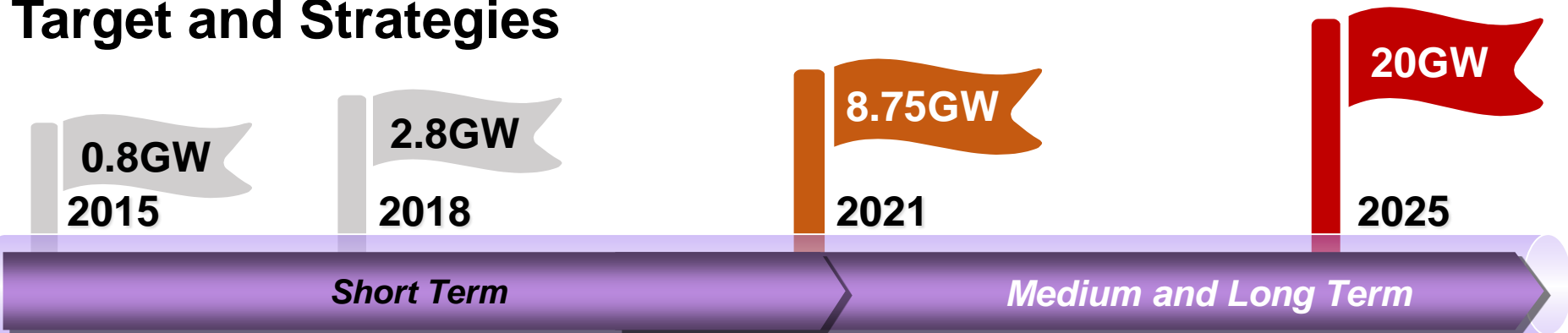
Targets for RE Development

- The government mainly focuses on the development of solar and wind Energy as the RE target aims at developing **20 GW** of **solar energy** and **5.7 GW** of **offshore wind energy**.
- Other renewables, such as waste-to-energy, geothermal and small hydropower are also been actively promoted.



Renewable Energy: Solar PV

Target and Strategies



8 GW

Rooftop

- Factories' roofs
- Government
- Public roofs
- Agricultural facilities
- The others



+ 12 GW

Ground-mounted

- Optimize land use
- Encourage hybrid projects

Renewable Energy: Offshore Wind

Target: 5.7 GW by 2025

Phase 1

Demonstration Incentive Program

■ Incentives for Pioneers

- Subsidy for 2 Wind Farms by 2020 (238 MW)

Phase 2

Zone Application for Planning

■ Transition Period

- 36 Zones of Potential (totally 5.5 GW allocated)

Phase 3

Zonal Development

■ Self-sustaining Industry

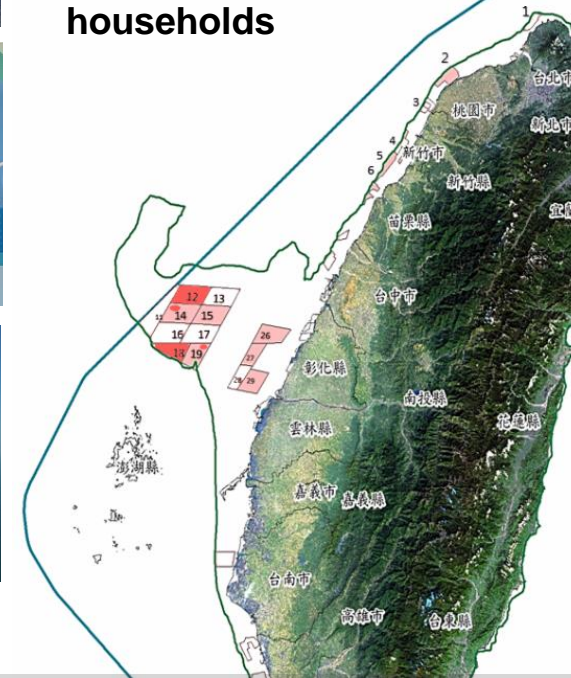
- Optimal Resource Utilization



Formosa Demonstration Wind Farm



- Total capacity 128 MW
- First commercial-scale offshore wind project
- Construction initiated on 18th May 2018 (on-grid in 2019)
- Annual production 480 GWh, supplying 128,000 households



Renewable Energy: Offshore Wind

DRAFT VERSION

Phase 3: Zonal Development

2026 - 2035 Total capacity 15 GW

Capability Review & Bidding Process

2026 - 2031
Release capacity: 9 GW

2032 - 2035
Release capacity: 6 GW



Stage 1 : Year-based capacity installation

Period 1

- Grid-connection year: **2026 -2027**
- Alloc.: **3 GW**
- Selection: **Q2-Q3 2022**

Period 2

- Grid-connection year: **2028-2029**
- Alloc.: **3 GW**
- Selection : **Q2 2023**

Period 3

- Grid-connection year: **2030-2031**
- Alloc.: **3 GW**
- Selection: **Q2 2024**

Qualifications of Application: EIA consent and financial criteria passed



Stage 2

Further planning would be based on the results of stage1 and the international technology development.

IV. Energy Efficiency and Conservation



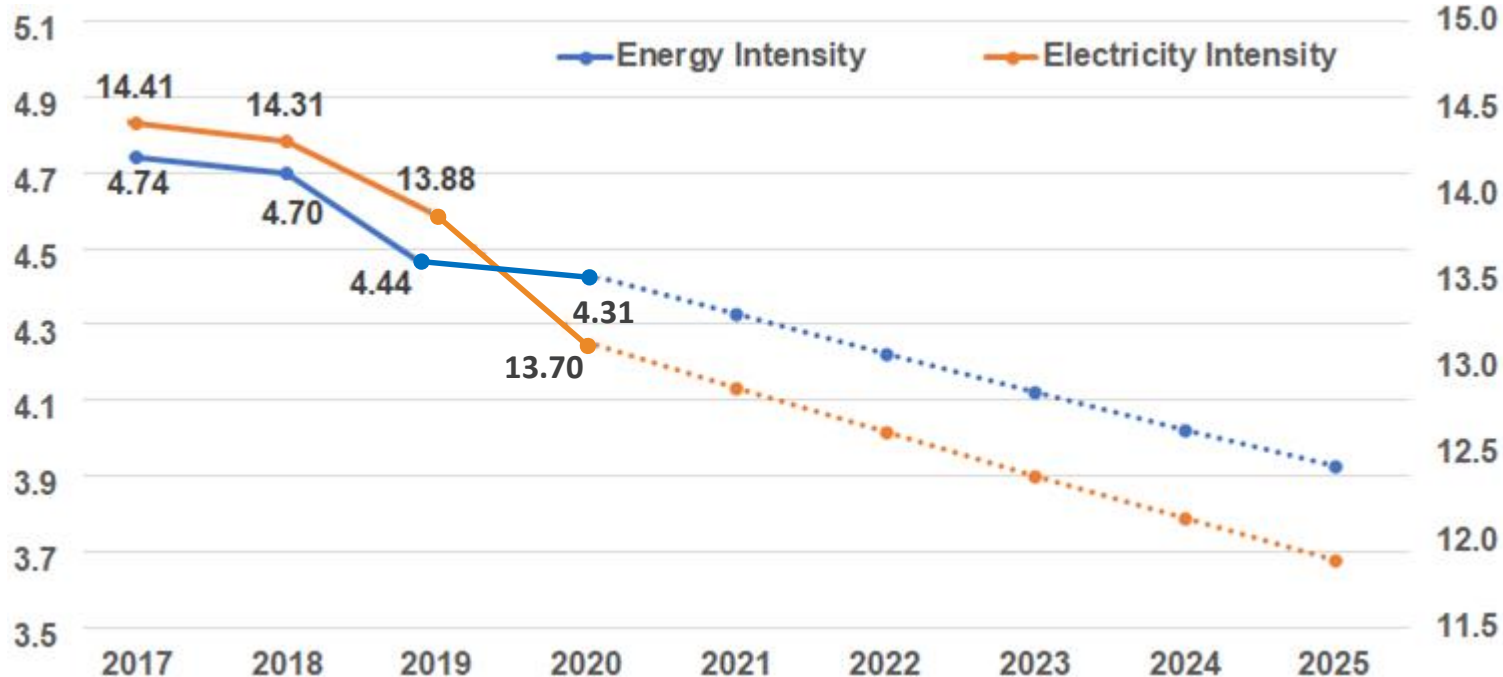
Energy Conservation Goal

Policy goals of Average Energy Intensity and Electricity Intensity improvement from 2017 to 2025:

- Energy Intensity : **-2.4%** annually
- Electricity Intensity : **-2%** annually

LOE/NT\$1K

kWh/NT\$1K



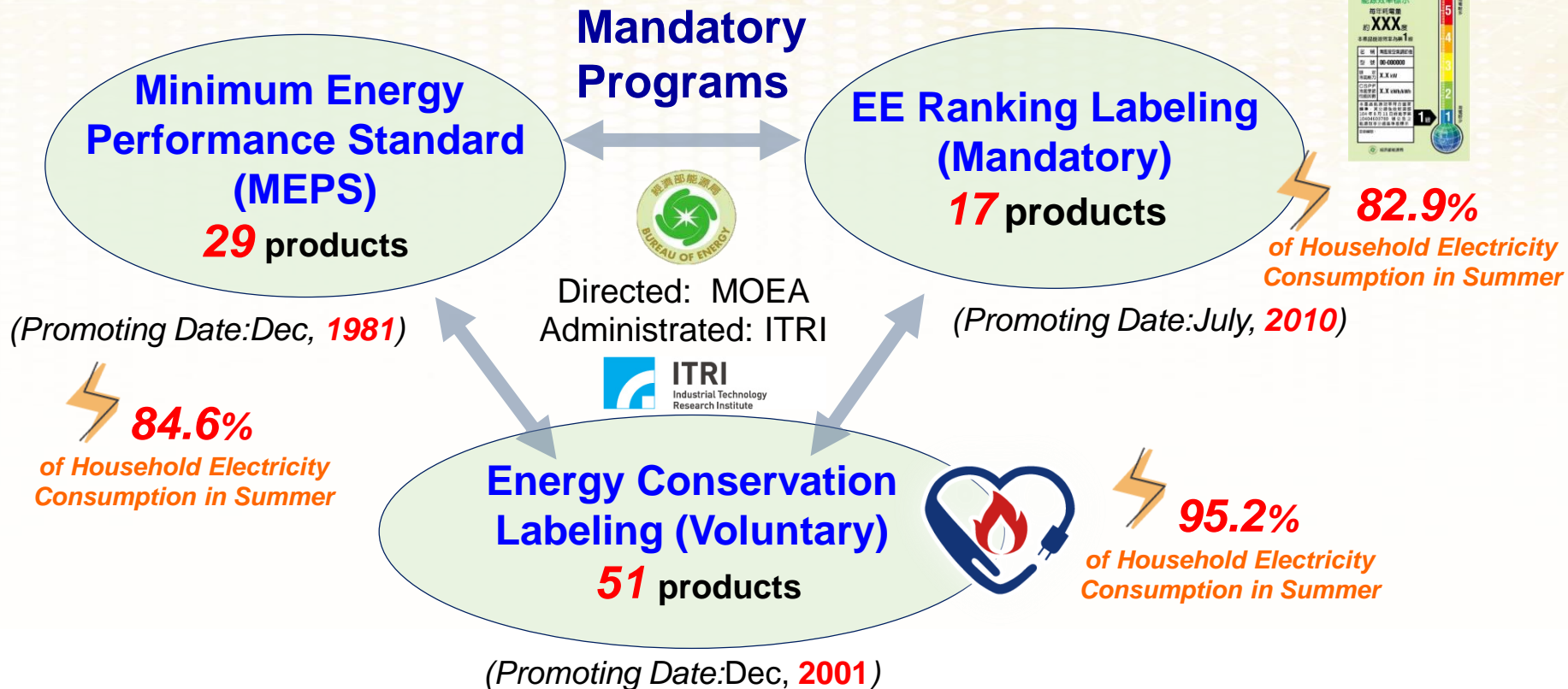
Enhancing Measures

- Expand the scope of incentives and assistance to energy users.
- Strengthen laws and regulations for continuous improvement.



Mandatory & Voluntary Programs

- To **provide guidance** to consumers for the purchase and to **encourage** manufacturers to produce high energy efficiency products. **Three principal policies** have been employed in the promotion of energy efficiency management for equipment and apparatuses.
- Average Energy Intensity **improvement** from 2017 to 2020 is **3.0%** which is better than EC goal 2.4%.



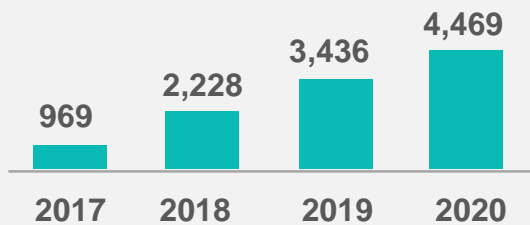
New Power Saving Campaign Program

- Continuous implementation of New Power Saving Campaign Program
- Joint efforts between the local and central governments to promote mid- and long-term energy saving plans

Energy Saving Carbon reduction



▶ Power Saving Target



Target

4,469 GWh

(From 2017 to 2020 Cumulative)

Achieved

4,611 GWh

(From 2017 to 2020 Cumulative)



Government Leadership



Industry Participation



Community Involvement



Building Efficiency



Government **313** GWh

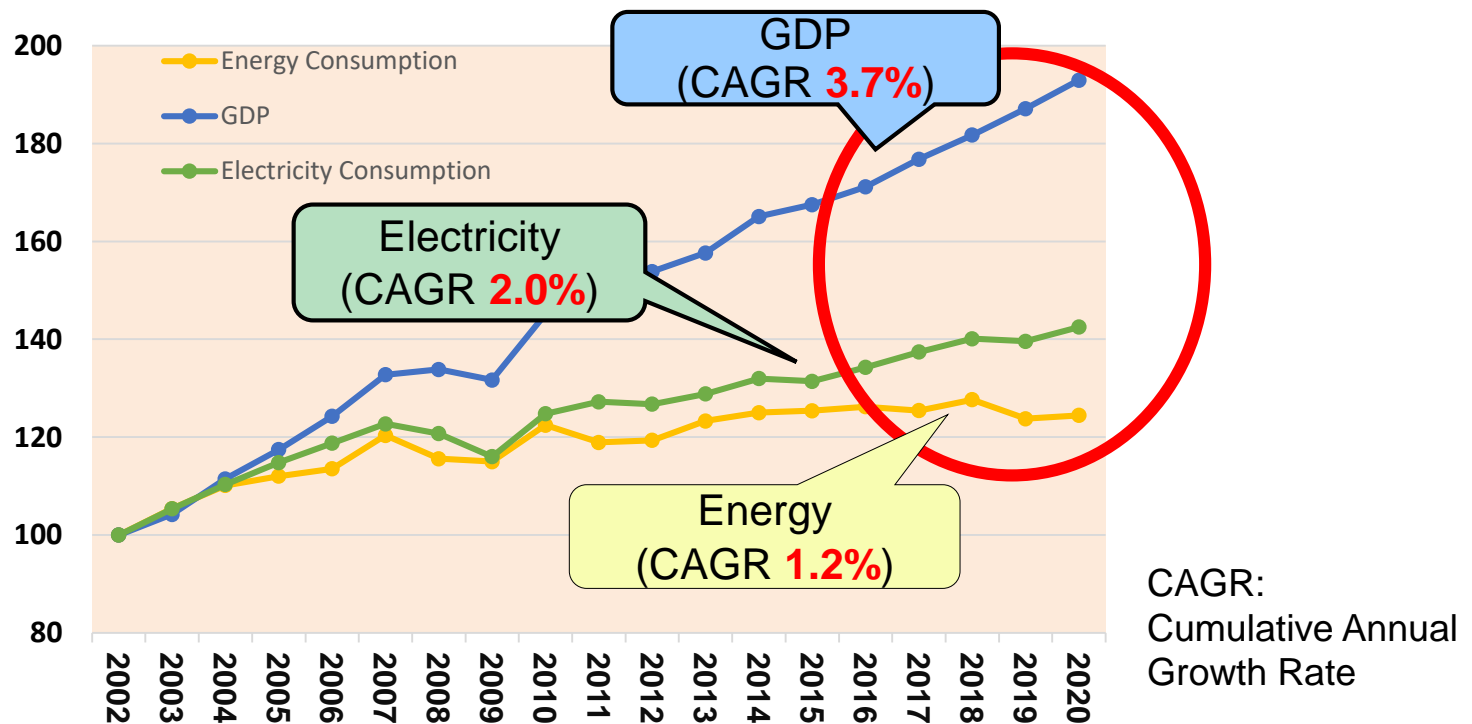
Livelihood **1,586** GWh

Industry **2,712** GWh

Achieved Performance in Energy Efficiency

■ Improved energy efficiency resulting in contained energy consumption growth

- Growth rates of energy and electricity consumption being substantially **lower** than that of GDP in recent years in Chinese Taipei
- Data showing energy consumption and GDP moving towards **decoupling**



V. Conclusion



Conclusion

- Chinese Taipei is plotting a path to achieve **net zero emissions by 2050**, both via an ongoing energy transformation, and by developing systematic strategies to reduce emissions in different sectors.
- The government aims to increase the share of renewable energy generation **to 20% by 2025** (20 GW of solar PV & 5.7 GW from of offshore wind) to achieve our energy transition target.
- We have set goals of improving **energy intensity** by an average of **2.4%** and **electricity intensity** by **2%** annually from 2017 to 2025.
- We look forward to enhancing **cooperation with APEC member economies** and move toward a net-zero energy future.

Thank You



Bureau of Energy,
Ministry of Economic Affairs