Latest Direction for Energy Transition towards Carbon Neutrality in Thailand

Possibility of SMRs

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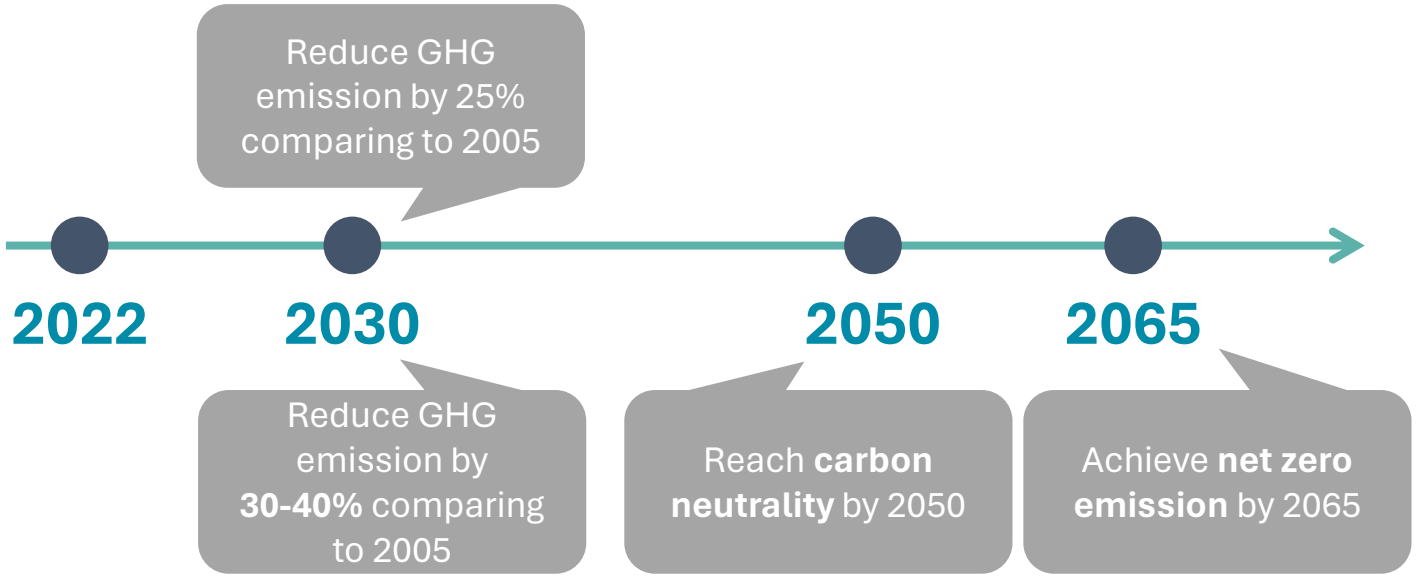
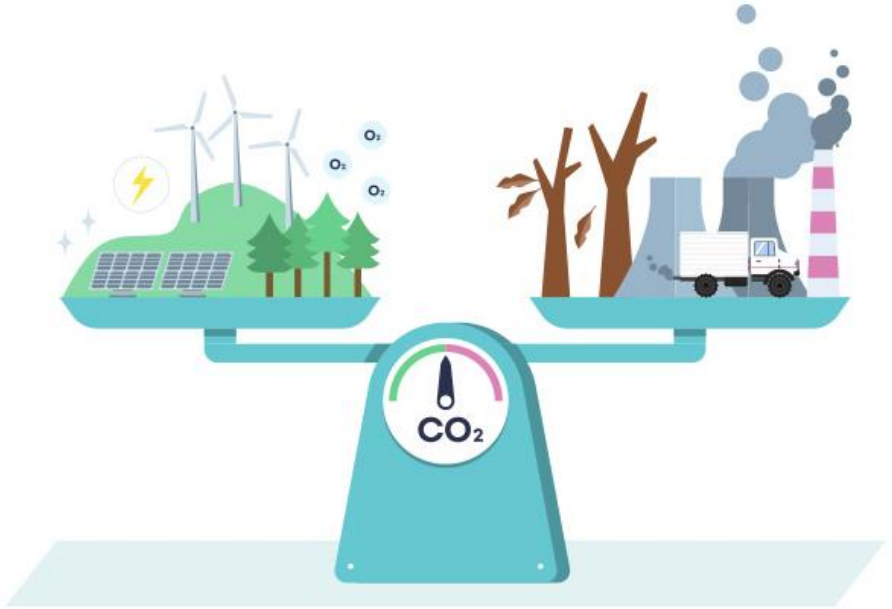
Thailand's Carbon Neutrality and Net Zero Emission Goals

Updated NDC (2020): National Determined Contribution





2nd Updated NDC (2022)

https://unfccc.int/documents/620602

Policy Directions in Upcoming National Energy Plan

1. **Increase renewable energy power plants with target of 50% at minimum**

- Cost of renewable energy is trending lower
- ESS will stabilize system
- Minimize long term energy cost

2. **Electrify transportation through electric vehicle following 30@30 policy**

- 30% zero emission vehicle production of total vehicle production by 2030
- Balance between biofuel operated vehicles and EV

3. **Improve energy efficiency by more than 30%**

- Use technology and innovations to manage energy efficiently
- Target can potentially be increased to 40%

4. **Building infrastructure to support energy transition**

- Follow 4D1E paradigm (Digitalization, Decentralization, Decarbonization, De-regulation and Electrification)

Key Principles in Power Development Plan Formulation

the stability of the country's power system

(Energy Security)

take into account

- country & reginal power system
- Disruptive Technology and Energy Transition
- IPS

Affordable electricity price (Economy)

Appropriate cost of power generation for long-term economic competitiveness

Environmental friendly (Ecology)

- Limit CO2 emissions in accordance with the Carbon neutrality and Net zero emission target
- Increase renewable energy
- Increase efficiency in the power system by developing Smart Grid

Candidate Power Plants

Fossil

- Combined Cycle Power Plant (NG)
- Combined Cycle Power Plant (NG+H)
- Gas turbine Power Plant (Diesel/NG)
- Gas Engine Power Plant (LNG)
- Thermal Power Plant (Ammonia Co-firing)

Clean Energy

- Pump Storage Hydro Power Plant
- Import Hydro Power Plant
- Solar (Solar Farm/Solar Rooftop/Solar Floating)
- Solar+BESS
- Other RE (Wind/Small Hydro/Biomass/Biogas/Waste)
- Small Modular Reactor

Others

- BESS
- DER
- Carbon Capture Utilization and Storage

Pros and Cons of Competing Options

Hydrogen and ammonia co-firing	CCUS	SMR
• The utility can partially utilize existing technologies. • The utility can maintain the current supply chain (and employment). • Hydrogen and ammonia are still relatively expensive.	• Thailand can still rely on stable supply of fossil fuel-based electricity. • CCS is based on proven technology and is now economically competitive. • The technology readiness level of most CCU technologies are still low. • Hydrocarbon is still being combusted.	• The industry can rely on clean and stable supply of electricity by SMR. • SMR can complement the nature intermittency of renewable energy. • The public is still concerned about the safety and the radioactive waste.

Recent Activities in Related Organizations

EGAT	TINT	CU	NSTDA
• The team for **feasibility study of nuclear energy** has been revived (focusing on SMR).	• A working group has been established to develop a **white paper on SMR policy options** in collaboration with NXPO.	• A proposal on **technical feasibility study of SMRs** has been proposed. • Current faculty members still maintain the knowledge and know-how on nuclear power.	• SMR has been selected as one of the **10 technology to watch** in 2024.

Final Remarks

- SMR is **not new** in Thailand.
  - It has a great potential to **contribute to the carbon neutral commitment** of Thailand and aligns with its key principles in power development.
- SMR has pros and cons, and so do other candidates.
  - The world is shifting from competition of different clean power technologies **towards synergy of all plausible clean technologies**.
- **SMR can overcome a number of shortcomings of large reactors.**
  - It is (claimed to be) safer, more economical, more financially friendly, easier to construct, etc.
  - It has more options in radioactive waste management.
  - It can be **easier to convince the public** that several risks in large reactors can be mitigated.
- The remaining task is to prove that these benefits can **alleviate public concern** which will eventually **lead to political commitment**.

Thank You

for your attention

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