Power development plan and NDC

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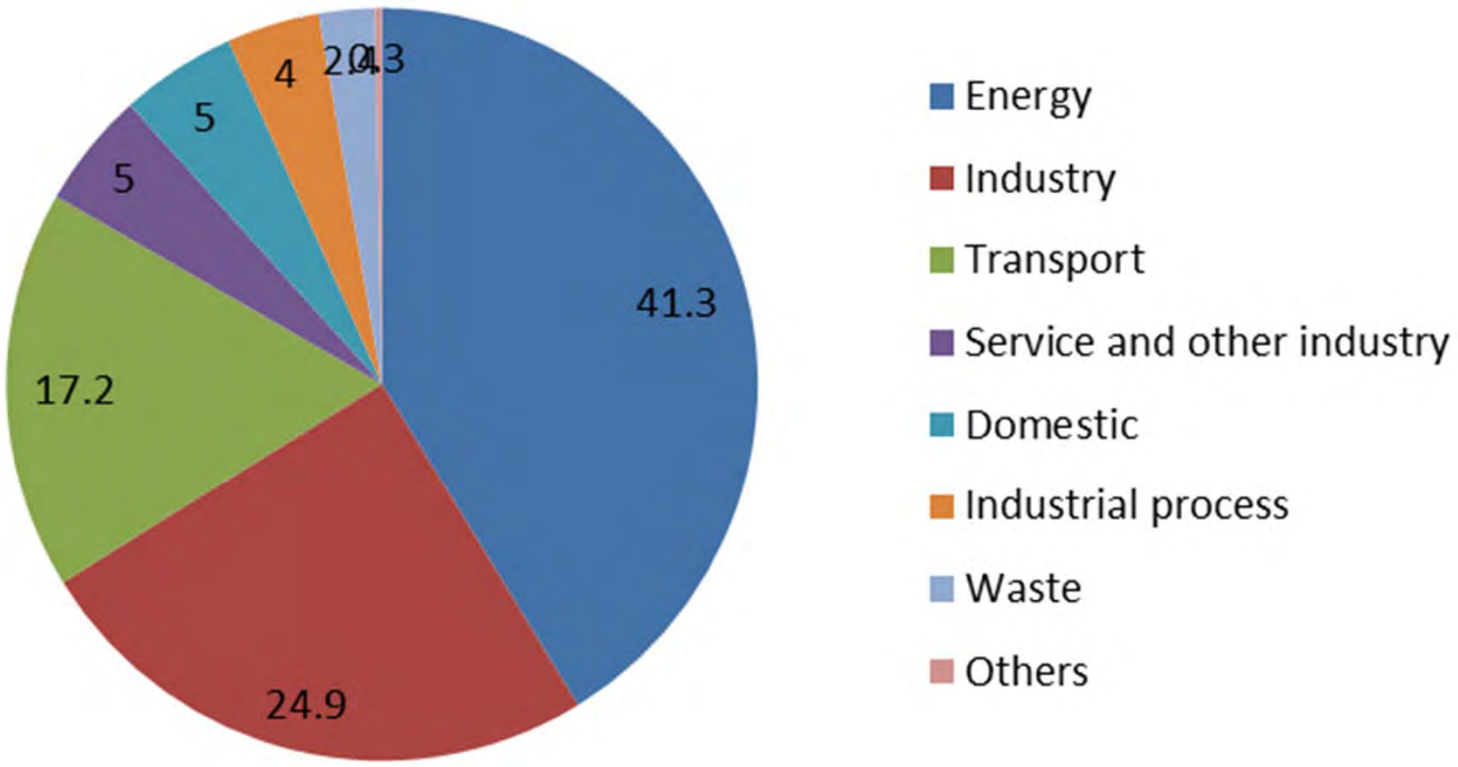
Energy Sector is the biggest GHG emitter in most countries



Source: Greenhouse Gas Inventory Office of Japan

Mitigation options of power sector

Mitigation options of power sector are one of the main subjects of NDC.

- Renewable energy developments such as solar PV, wind etc.
- Energy efficiency improvement of appliances
- Reductions of transmission and distribution losses

Power Development Plan

- Power Development Plan is very common in the world to secure electricity demand and supply balance.
- Power development plan includes both demand forecast and power development projects.
- Most power development plans are extended more than 10 years (typically 20 – 30 years.)

Review and update of Power Development Plan

- Power development plans are often reviewed and updated periodically.
  - Update annually: Japan, Indonesia (RUPTIL) etc.
  - Every 5 years: Vietnam (8th Power Development Plan 2016 – 2030) etc.
  - Not periodicity but in a few years: Thailand etc.

Statistics on electricity demand and supply

- Power industries are commonly regulated by government.
- Governments or power industries publish annual reports which include statistics of electricity demand and supply.
- Therefore it is easy to monitor the progress of mitigation options of power sector.

Challenge of integration of power development plan and NDC

- Main purpose of Power Development Plan is to secure power supply.

- Some countries extend the purposes to environmental sustainability as well as energy security.

- Power development plan of Thailand shows a good examples to integrate power development plan and NDC.

Thailand Power Development Plan 2015-2036 (PDP2015)

Ministry of Energy (Thailand) developed 5 integration master plans as follows:

(1) Thailand Power Development Plan: PDP,

(2) Energy Efficiency Development Plan: EEDP

(3) Alternative Energy Development Plan: AEDP

(4) Natural Gas Supply Plan,

(5) Petroleum Management Plan.

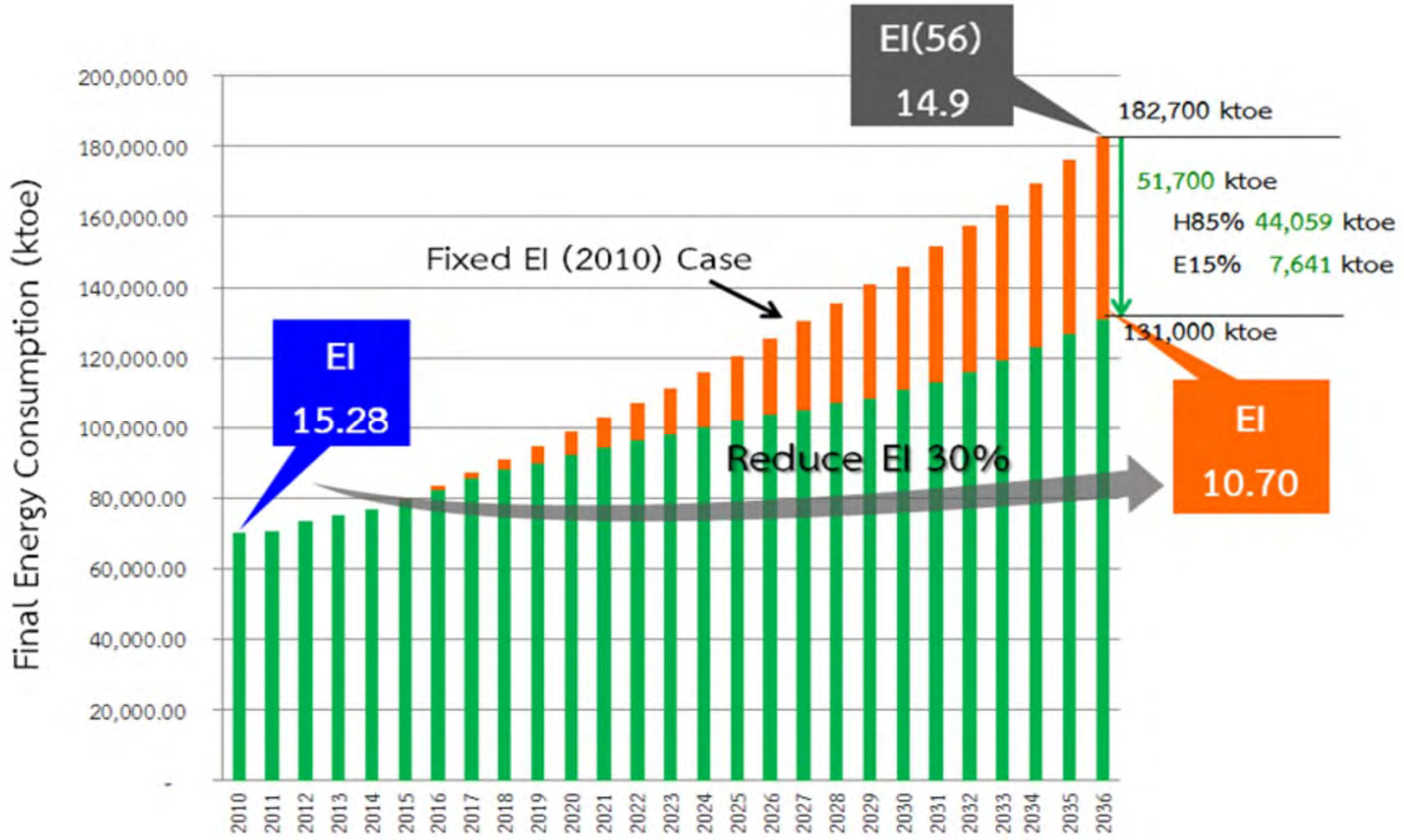
Focuses of PDP 2015

- Energy Security: coping with the increasing power demand to correspond to National Economic and Social Development Plan and taking into account fuel diversification

- Economy: maintaining an appropriate cost of power generation for long-term economic Competitiveness

- Ecology: lessening carbon dioxide intensity of power generation.

Energy Conservation Target during year 2010-2036



Comparison of power demand forecast between BAU case and Base case

Year	BAU case		Base case		Difference (%)	
	MW	GWh	MW	GWh	MW	GWh
2016	30,304	198,439	30,218	197,891	-86	-548
2036	59,300	393,335	49,655	326,119	-9,645	-67,216

BAU case: Statistical data of 2013 is used.

Base case: In year 2036, the energy intensity would be reduced from that of year 2010 by 24 percent which is consistent with the EEDP.

Alternative Energy Development Plan in year 2036 (MW)

	2014	2036
Solar	1,299	6,000
Wind	225	3,002
Hydro	3,048	3,282
Waste	66	500
Biomass	2,542	5,570
Biogas	312	600
Energy crops		680
Total	7,480	19,634

CARBON DIOXIDE EMISSION FROM POWER GENERATION

Year	2015	2036
Emission factor (kgCO2/kWh)	0.457	0.319
Total CO2 Emissions (Thousand tons)	86,998	104,075