Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

Asia-Pacific
Economic Cooperation

UPDATE on Thailand's Clean Energy Policy & Plan Toward Carbon Neutrality

"The Joint Meeting of Four Expert Groups on the APEC Energy Working Group and Associated Workshop"

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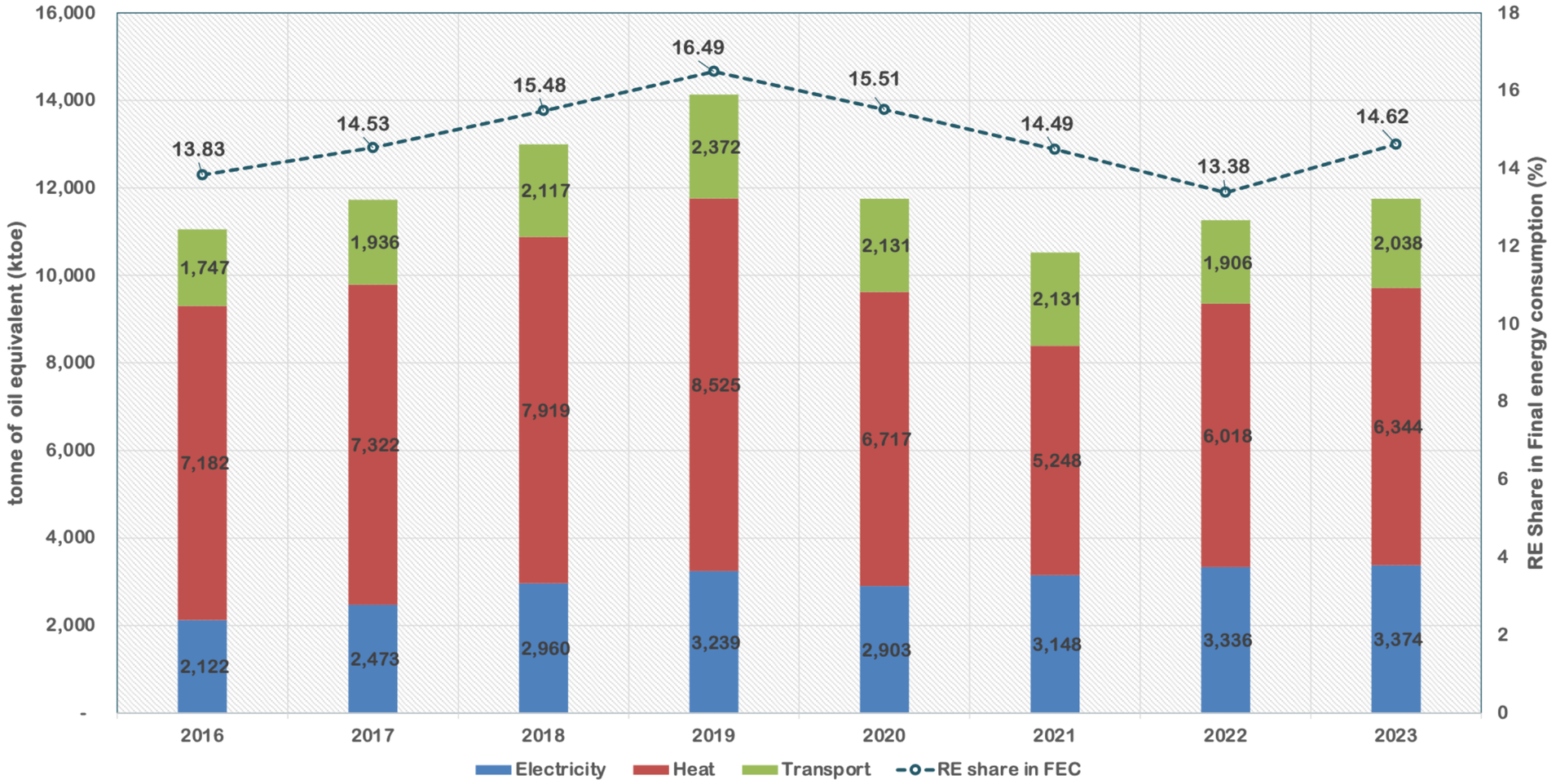
RE Ratio in Thailand

AEDP2018 (2018 – 2037) :Target: 30% RE share in final energy consumption



Source: Thailand Alternative Energy Situation 20223 DEDE.

Current RE Status in Thailand

Statistic of Renewable energy use according to AEDP2018 (2018 – 2037)

Electricity

	Target 2037 (MW)	Status 2023 (MW)
Solar PV	12,139	3,2449.32
Floating PV	2,725	45.00
Biomass	5,790	3,869.81
Wind	2,989	1,543.56
Biogas	1,565	559.04
Wastes	975	411.24
Hydro	3,228	3,132.09
Geothermal	-	0.30
GOALS 43.55%	29,411	12,810.37

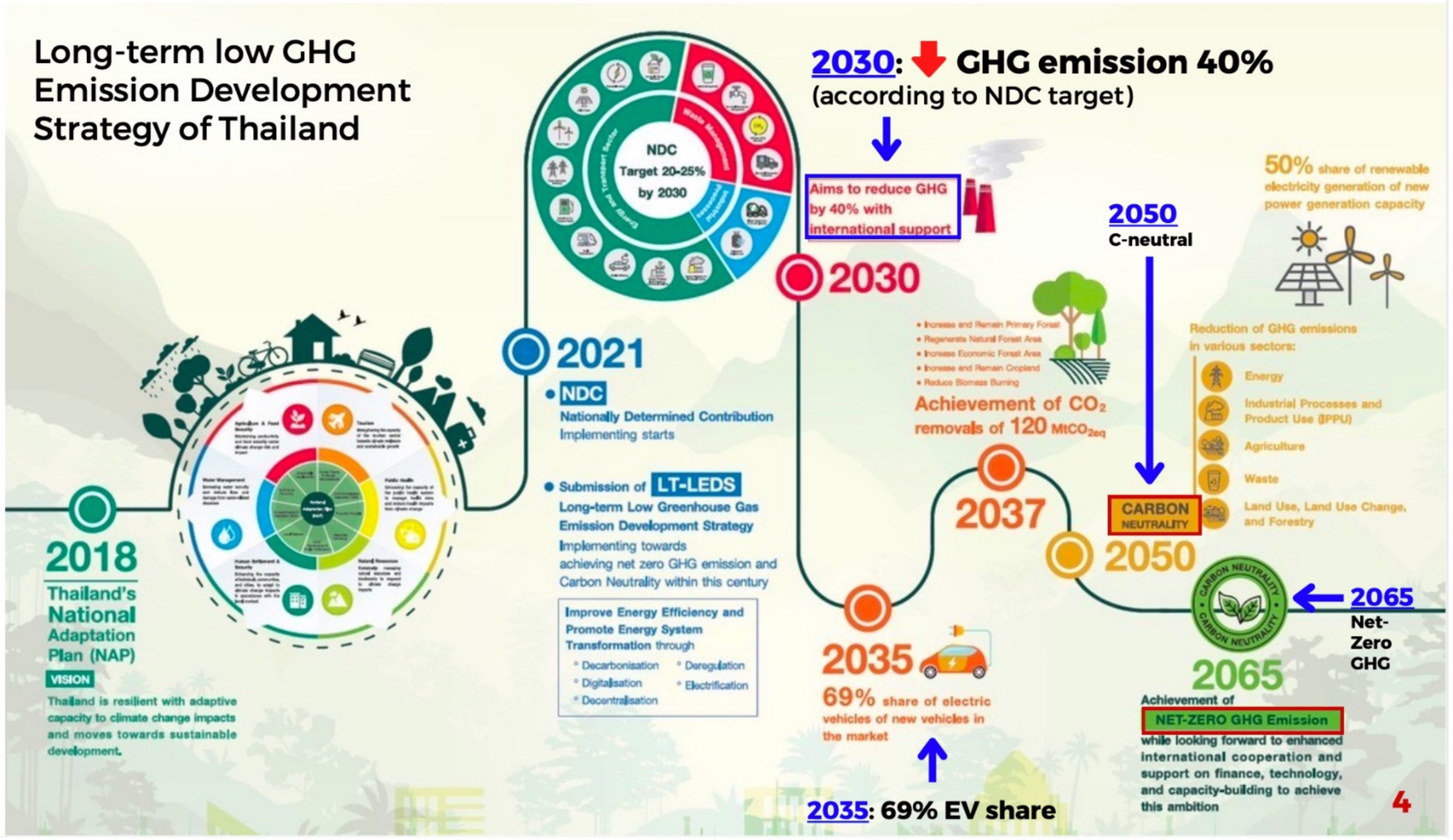
Heat

	Target 2037 (ktoe)	Status 2023 (ktoe)
Solar PV	100	8.97
Biomass	23,000	5,457.00
Biogas	1,283	678.00
Wastes	495	200.00
Biomethane	2,023	-
GOALS 23.58%	26,901	6,343.97

Transport

	Target 2037 (ML/d)	Status 2023 (ML/d)
Ethanol	7.50	3.53
Biodiesel	8.00	4.39
Pyrolysis oil	0.53	-
GOALS 49.42%	16.03	7.92

GHG Mitigation strategy



COP 26 GLASGOW

Thailand's Commitment for GHG mitigation

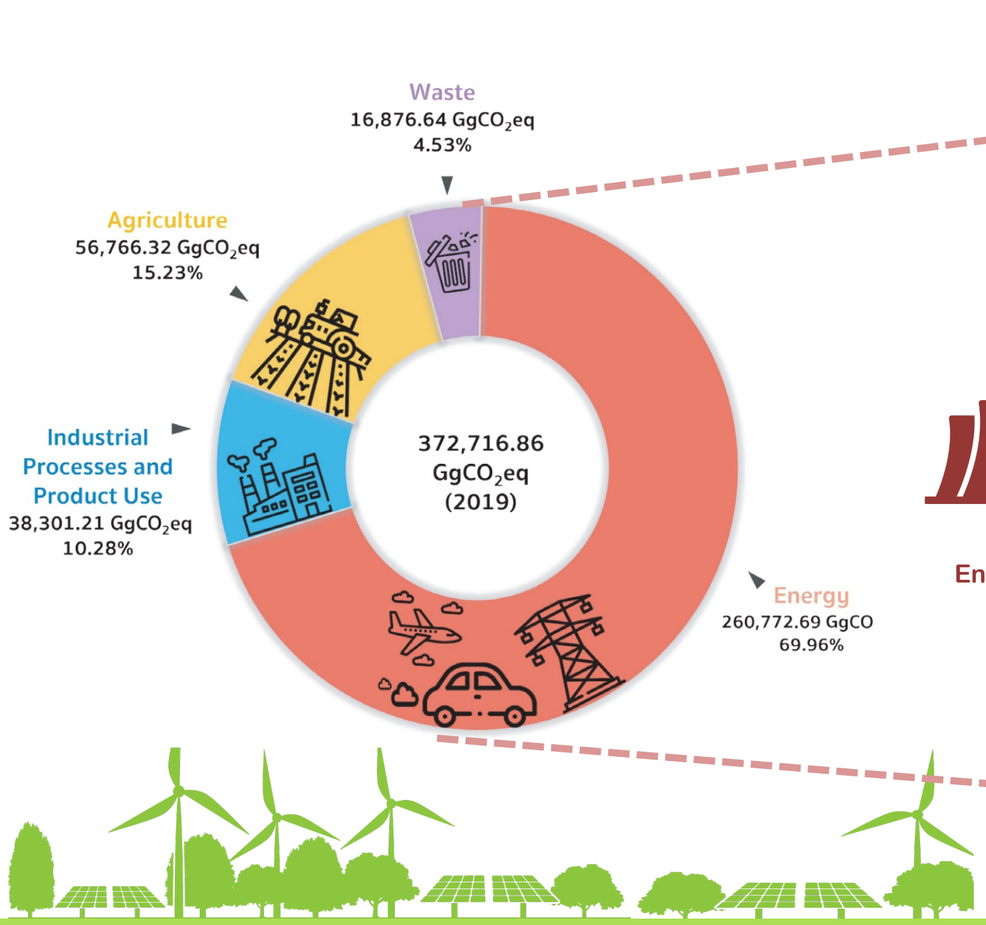
2030: reduce 30% GHG compared with BAU (40% with international support)

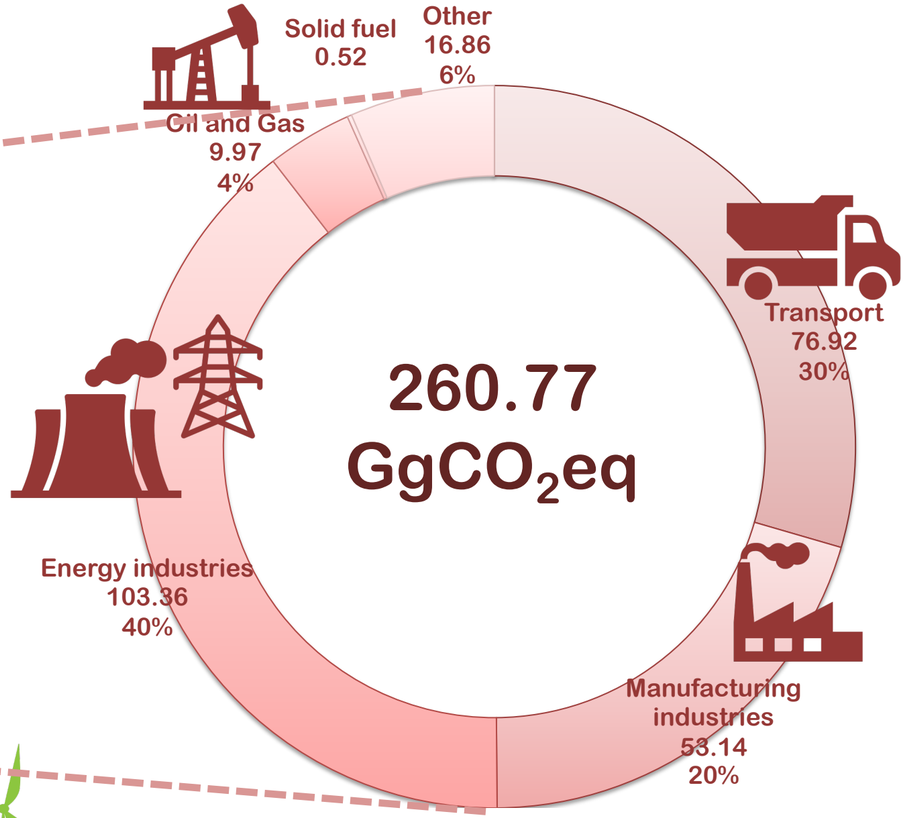
2050: Carbon neutrality

2065: Net-Zero GHG

Source: Global Compact Network Thailand.

Thailand's GHG Emission





- The energy is the largest contributor to greenhouse gas emissions in Thailand, almost **70%** followed by Agriculture & Waste
- Significant sectors include **electricity production and transport**

Source: THAILAND'S FOURTH BIENNIAL UPDATE REPORT

AEDP2024 (Draft)

Increase renewable energy share to **37%** in total final energy consumption by 2037

Electricity

73,286 MW

- Solar PV
- Floating PV
- Biomass
- Wind
- Biogas
- Wastes
- Hydro
- Geothermal
- Hydrogen

Heat

17,3690 ktoe

- Solar PV
- Biomass
- Biogas
- Wastes
- Geothermal
- Pyrolysis oil
- Hydrogen

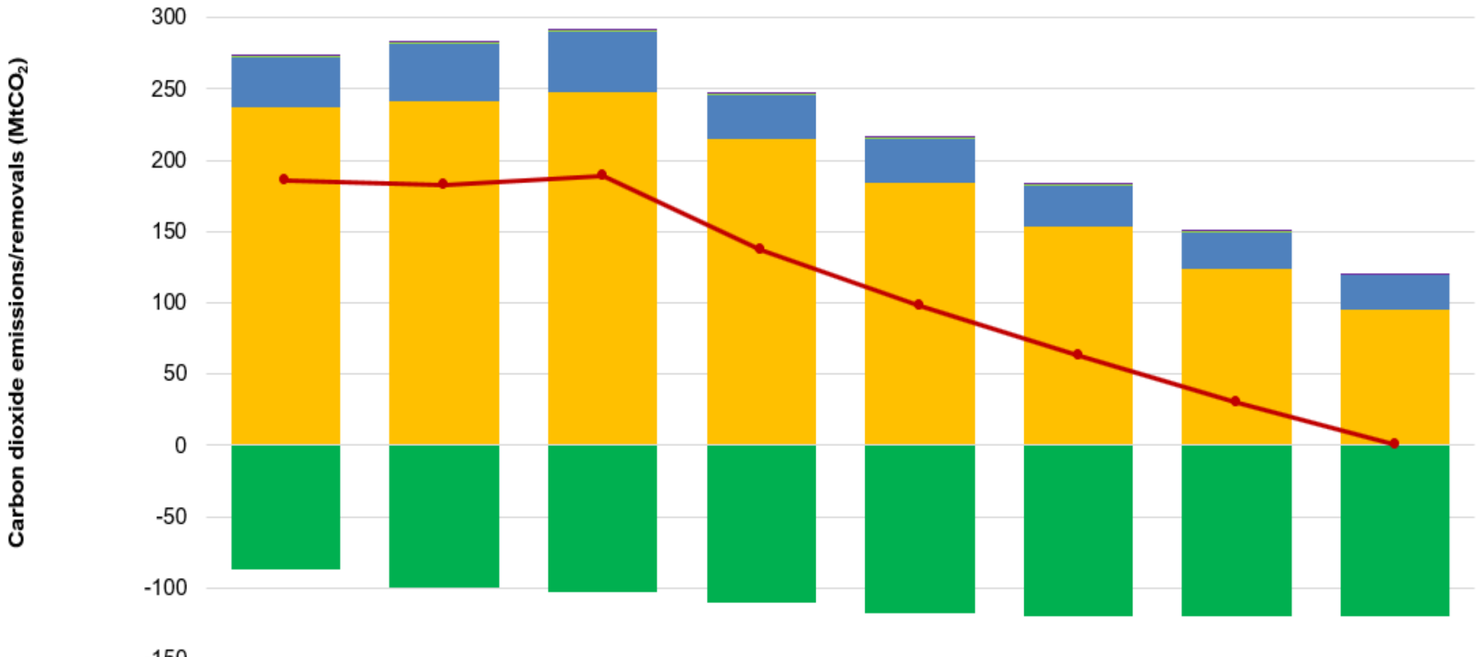
Transport

1,939 ktoe

- Ethanol
- Biodiesel
- Hydrogen
- Sustainable Aviation Fuel (SAF)

GHG Emission scenario

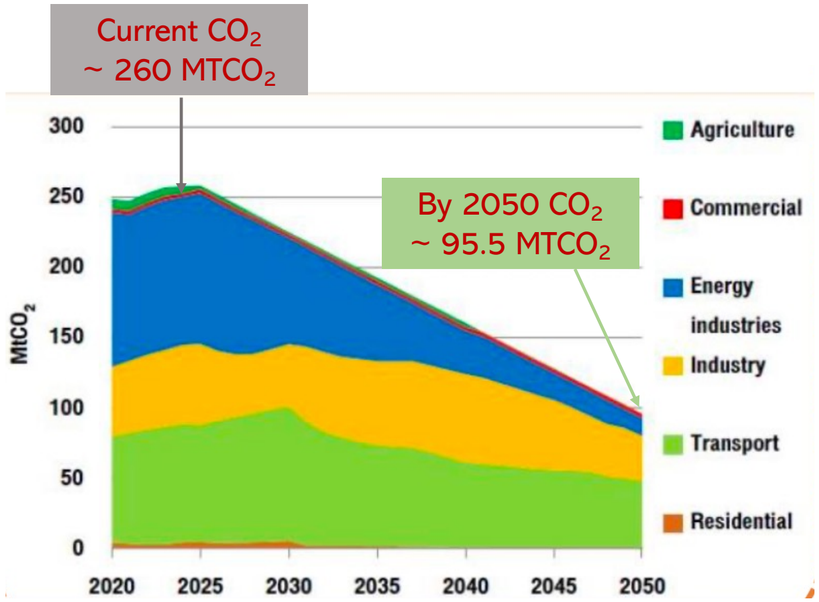
To response to Carbon Neutrality by 2050



	2015	2020	2025	2030	2035	2040	2045	2050
Waste	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
LULUCF	-87.3	-100.0	-103.0	-110.0	-118.0	-120.0	-120.0	-120.0
Agriculture	1.4	1.5	1.6	1.4	1.3	1.0	0.8	0.5
IPPU	34.8	40.0	41.5	31.2	30.3	28.2	26.0	23.8
Energy	236.9	241.4	248.2	214.5	184.6	153.7	123.6	95.5
Net emission	186.0	183.1	188.5	137.3	98.4	63.1	30.6	0.0

Source: ONEP Thailand.

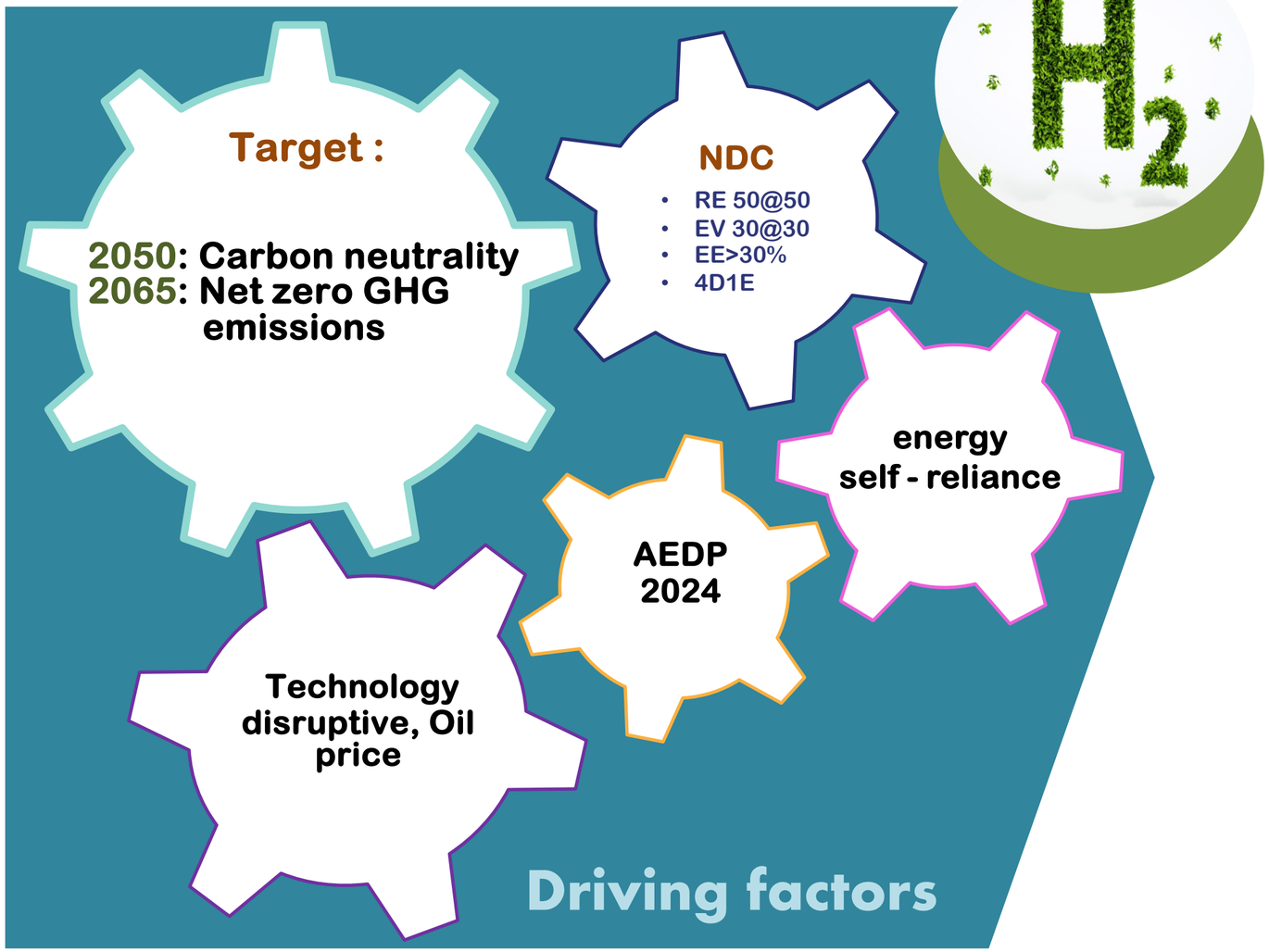
CO_2 emission in energy sector by subsector under C-neutrality 2050



Total CO_2 emission target in Energy sector in 2050

95.5 $MtCO_2$

THE FUTURE OF RENEWABLE ENERGY



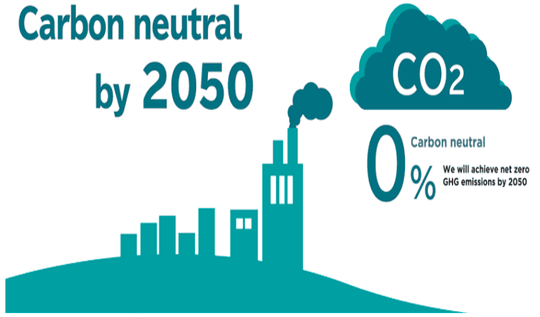
- Thailand must urgently find clean, reliable energy. Let's help reduce GHG emissions while maintaining our ability to meet energy needs.
- Hydrogen: Clean energy has been discussed both on the global stage and in the framework of the national energy plan.
- Driving the use of hydrogen in the energy sector It is therefore consistent with the global direction and helps achieve climate goals. along with creating energy security

Current Hydrogen Projects in Thailand

1. **Electric Power Sector : Hydrogen power plant (EGAT) 300 kW (Saraburi Province) – Clean electricity produced from wind turbines then used in an electrolyzer to split water into hydrogen and oxygen. Next, fuel cell is used to convert hydrogen and oxygen into electricity.**

2. Heat Sector : -

3. Transportation Sector : Toyota Mirai car, FCEV type, to serve as a shuttle for tourists at U - Tapao Airport or provide services to tourists and those interested in the Pattaya - Chonburi area.



Thailand's Strategies and Promotion guidelines (Draft)

Vision and targets in the short and medium term

Thailand is ready. Commercial use of hydrogen in the energy sector could start from 2030 and grow sustainably to become one of the key options towards achieving carbon neutrality in 2050.

Promotion guidelines

Strategic 1
Develop markets and create incentives to the user

- Financial and investment support measures for user groups
- Develop a pricing mechanism that considers GHG emissions criteria.
- Develop the pilot projects

Strategic 2
Promote research and industry in the country

- Financial and investment support measures for entrepreneurs
- Develop markets and carbon trading mechanisms
- Promote research and development of new business models

Strategic 3
infrastructure development

- Develop a pipeline network for mixed fuels.
- Develop storage, transportation and hydrogen filling stations.
- Develop Hydrogen and ammonia technology infrastructure

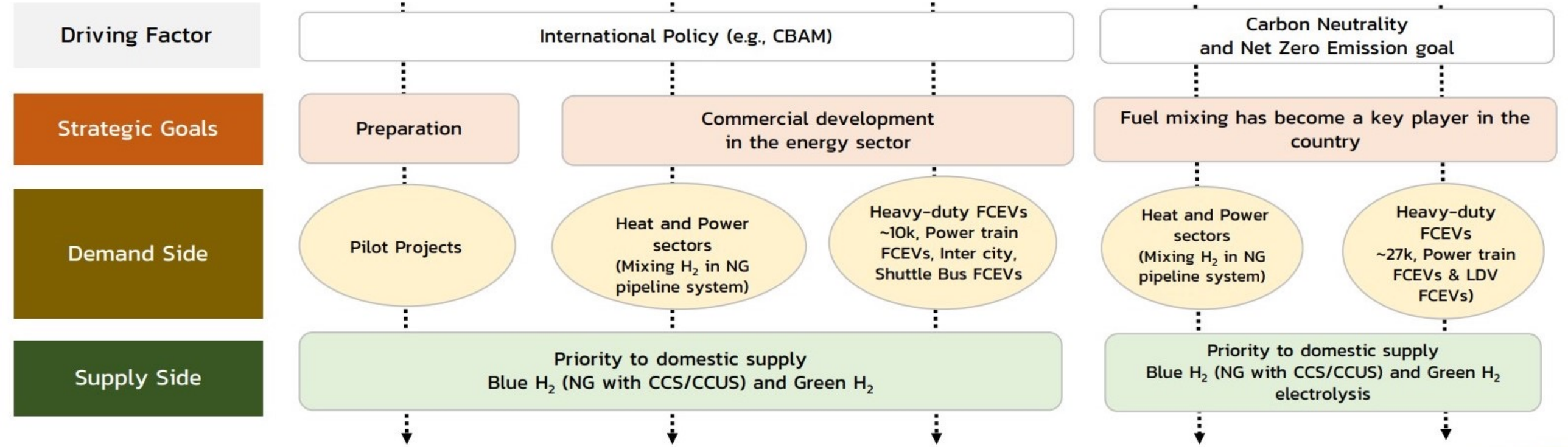
Strategic 4
Improve regulations and standards

- Improve regulations and standards Concerning use, production, safety, transportation, storage and distribution. for the energy sector

Thailand's Strategies and Promotion guidelines (Draft)

	Short term (2024 – 2030)	Medium term (2031 – 2040)	Long term (2041 – 2050)
1. Market development and Incentives	Support for pilot project investment	Support for device modification and mitigation Tax incentives based on GHG emissions	Phase out of carbon subsidies and valuation in price structure and mechanism
2. Research and Development, Domestics Industrial Supporting	• Study new business models • Hydrogen Valley • H_2 certificate	• Tax incentives and Investment promotion • R&D to increase efficiency, Reduce production and transportation costs	Develop a market platform and Carbon trading mechanism
3. Infrastructure Development	Import-Export plans Test and modify the piping system, storage and transportation	Import-Export terminal and infrastructure Modify the pipeline system and develop alternative transportation networks Refueling Station Development Plan (>70 locations)	Increase the mixing ratio up to 20% and modify the Re-Power network to support Green H_2. Refueling Stations (>180 locations)
4. Regulations and Standards Development	Safety standards in Production and Usage	Natural gas quality mixed with Hydrogen and Hydrogen transportation sector Storage Procedures, Tanks, Locations, and Hydrogen Storage Facilities	Inland and Pipeline Transportation Fuel cell, FCEV and Refueling Station standards

Thailand's Strategies and Promotion guidelines (Draft)



THANK YOU

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Target of (draft) AEDP 2024

Types of Energy	Unit	Year 2037
Electricity	**ktoe** **MW**	**15,332** **73,286**
1. Solar	MW	38,974
2. Floating Solar	MW	2,789
3. Wind	MW	9,379
4. Biomass	MW	5,490
5. Biogas (Wastewater/Waste)	MW	925
6. Biogas (Energy Crops)	MW	757
7. Municipal Solid Waste (MSW)	MW	1,142
8. Industrial Waste	MW	249
9. Small Hydropower	MW	347
10. Large Hydropower	MW	2,918
11. Imported Hydropower	MW	10,295
12. Others (e.g. Geothermal, Hydrogen)	MW	21
Heat	**ktoe**	**17,360**
1. Solar	ktoe	200
2. Biomass	ktoe	15,550
3. Biogas/Biomethane	ktoe	1,000
4. Waste	ktoe	600
5. Others (e.g. Pyrolysis Oil, Hydrogen, Geothermal)	ktoe	10
Bio-fuel/Alternative fuel	**ktoe**	**1,939**
1. Ethanol	ktoe	605
2. Biodiesel	ktoe	775
3. Sustainable Aviation Fuel (SAF)	ktoe	555
4. Hydrogen	ktoe	4
Renewable Energy Consumption (ktoe)		34,631
Final Energy Consumption (ktoe)		93,017
Proportion of Renewable Energy Consumption to Final Energy Consumption (%)		**37**