Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

Improving Energy Efficiency in Industry in Thailand

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Department of Alternative Energy Development and Efficiency

APEC Sectoral Symposia on the Holistic Approach of Decarbonization for Energy Transition

23 January 2024

กระทรวงพลังงาน
MINISTRY OF ENERGY

Outline

- Thailand's Energy Situation and Industries
- Energy Efficiency Plan (Draft)
- Key Measures

Source: DEDE

Thailand's Energy Situation and Industries

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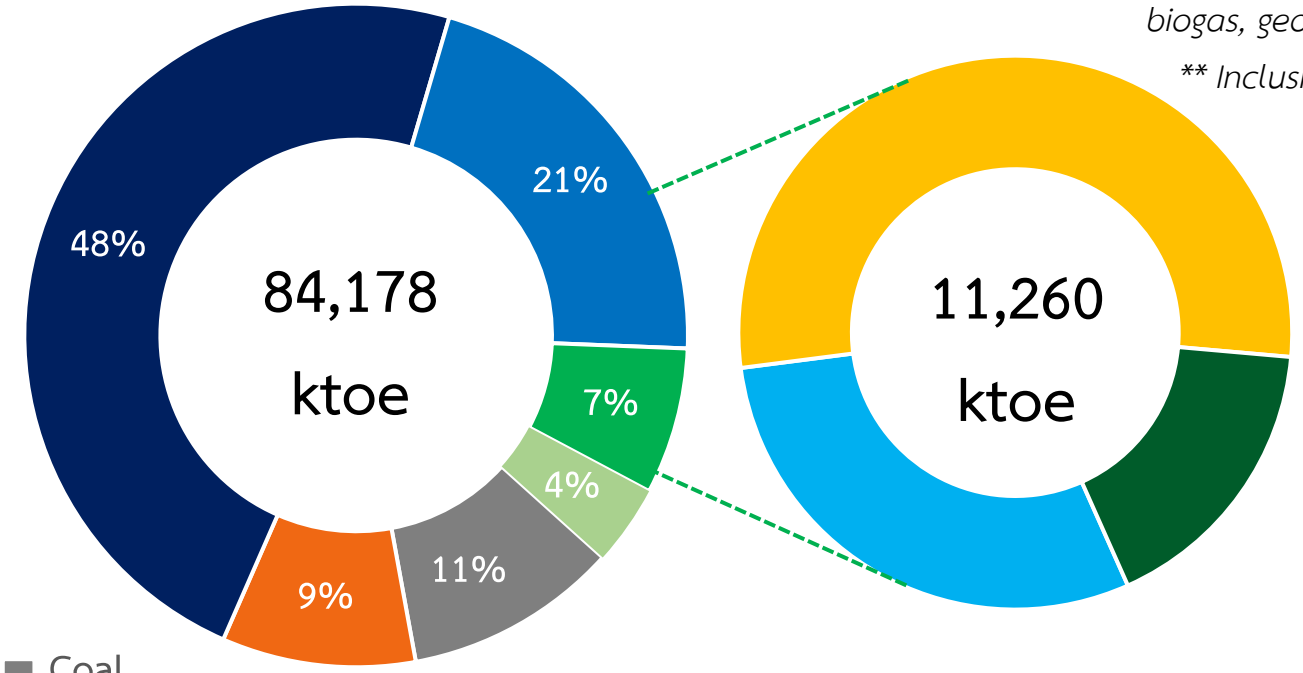
Thailand's Energy Situation

Final Energy Consumption 2022 by Fuel



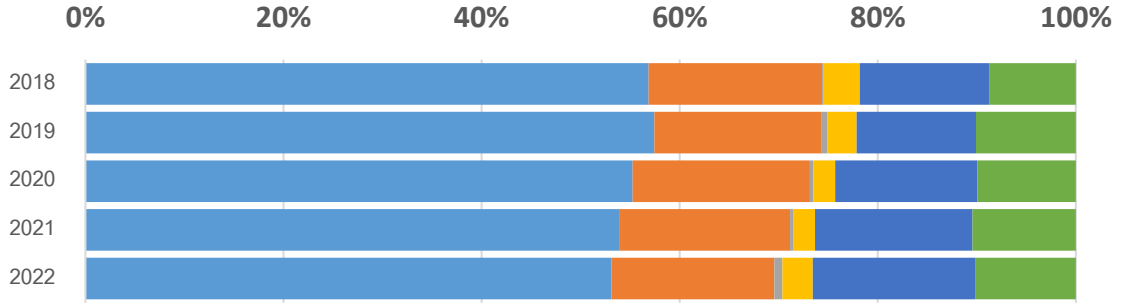
** Inclusive of solar, wind, biomass, MSW, biogas, geothermal – with off-grid generation*

*** Inclusive of solar, biomass, biogas, MSW*

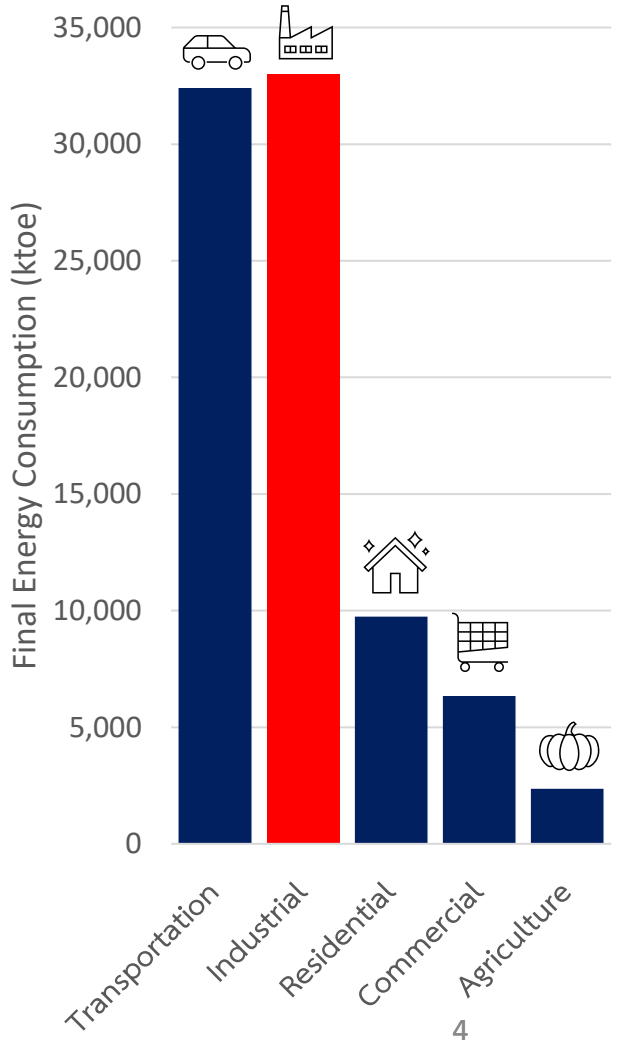
- Power Generation* 29.6%
- Heat** 63.5%
- Biofuels 16.9%

- Coal
- Natural Gas
- Petroleum Products
- Electricity (non-RE)
- Renewable Energy
- Traditional Renewable Energy

Electricity Energy Mix (GWh)



Final Energy Consumption 2022 by Sector



Source: Thailand's Energy Situation Report 2022, DEDE
Energy Statistics of Thailand 2023, EPPO

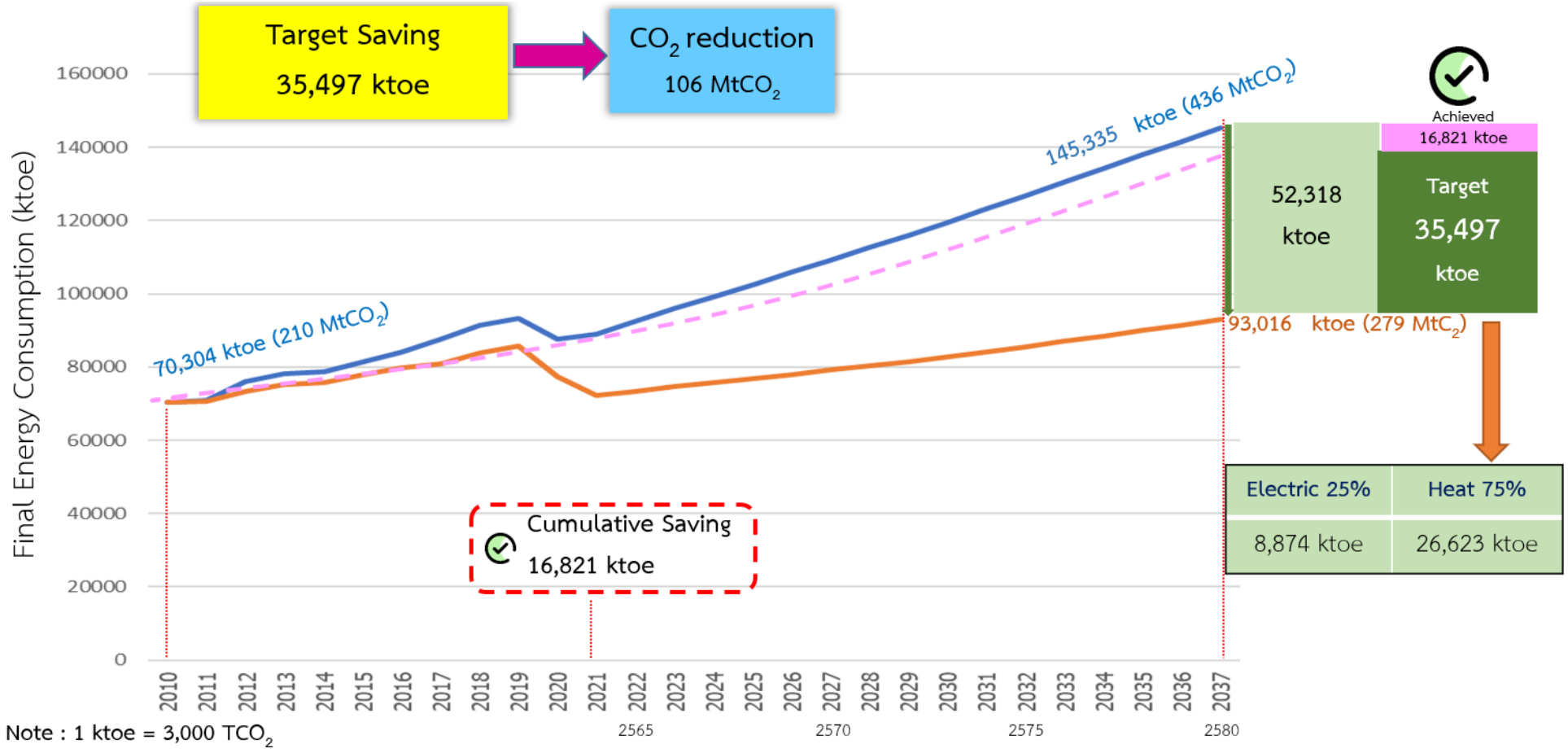
Energy Efficiency Plan (Draft)

New Energy Efficiency Plan (Draft)

Key Consideration:

- GDP and Population Projection Update (GDP 2.6) – March 18th, 2022
- Consider Carbon Neutrality target in energy sector (95.5 $MtCO_2eq$)
- Electric Vehicle projection from EPPO
- Sector-specific measures and supply-side measures

Target energy intensity (EI) reduction of 36% within 2037 compared to 2010 level



WORK IN PROGRESS – SUBJECT TO CHANGE!!!

New Energy Efficiency Plan (Draft) – cont.

Energy efficiency measures target by energy types: 2022 - 2037

Unit: ktoe

	Compulsory	Voluntary	Total	%
Electricity	3,822	5,051	8,874	25
Thermal	7,058	19,565	26,623	75
Total	10,880	24,617	35,497	100

Energy efficiency measures target by economic sectors: 2022 - 2037

Unit: ktoe

Sector	Compulsory		Voluntary		Total	%
	Elec.	Thermal	Elec.	Thermal		
1. Industrial	1,590	4,610	2,300	3,922	12,423	35
2. Commercial	1,700	32.	1,328	488	3,549	10
3. Residential	117	-	1,461	196	1,774	5
4. Agricultural	50	-	147	512	709	2
5. Transportation		1,650	-	15,538	17,03	48
Total	3,458	6,293	5,238	20,657	35,497	100

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Key Measures

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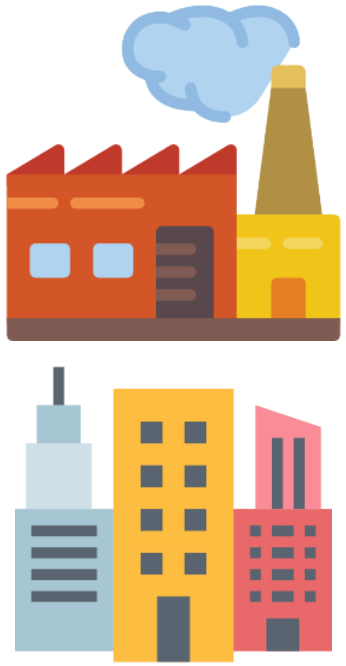
Key measures – Industrial and Commercial Sector



15,973 ktoe

Compulsory	Voluntary	Complementary
• Energy management standards in designated factories and buildings • Enforcement of factory and building energy codes	• Energy efficiency standards and labelling for equipment • Financial Incentives - Direct subsidy (Subsidy, 80:20) - Loans (Soft loan, ESCO Fund) - Tax incentive - Credit Guarantee Mechanism • **Promoting innovations** (IOT, Smart Factory, Smart Building, Big Data) • **Promoting energy efficiency in equipment utilizing renewable energy** (Biomass boiler, Biomass furnace, Generator, Solar Heat) • **Energy efficiency for the supply side**	• Human Resource Development • Public awareness • Research and Development of technologies and innovations

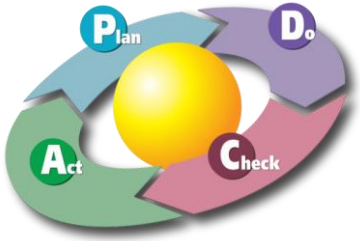
WORK IN PROGRESS – SUBJECT TO CHANGE!!!

1. Energy Management System

Classification of designated factories/buildings

Criteria	Designated Factories/Buildings	
	Group 1	Group 2
Installed electric meter (total)	Between 1000 – 3000 kW	More than 3000 kW
Installed transformers (total)	Between 1,175 – 3,530 kVA	More than 3,530 kVA
Total annual energy consumption	Between 20 – 60 TJ/year	More than 60 TJ/year

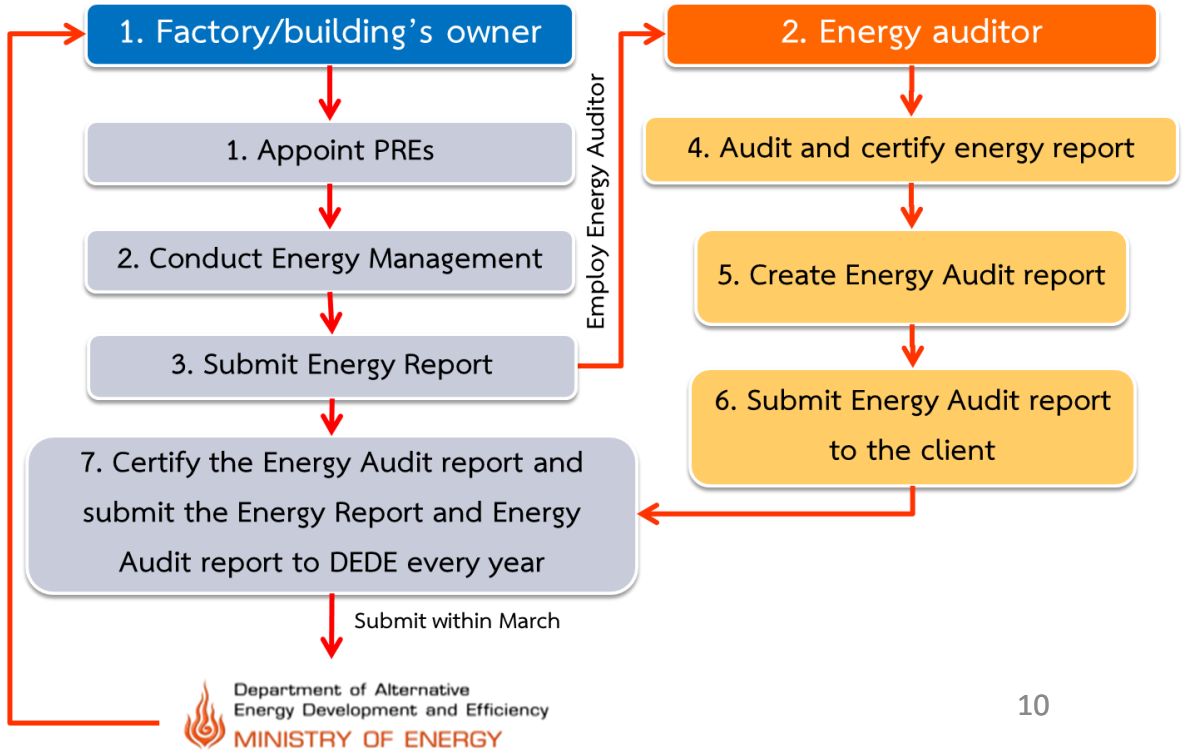
Current status (as of January 1st 2024):
6,473 designated factories
3,324 designated buildings
9,797 in total



Legal responsibilities of designated factories/buildings

1. Appoint Person Responsible for Energy (PRE)
   - At least 1 PRE for Group 1 – (C-PRE/S-PRE)
   - At least 2 PREs for group 2, in which one must be senior PREs (S-PRE).

2. Conduct energy management system as described in regulation and submit an annual report to DEDE every March.



C-PRE: Convention PRE, S-PRE: Senior PRE

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2. Financial Incentive - Subsidy Program 20 – 80

Measure Overview

- Subsidize equipment and machinery replacement (with approved high-efficiency ones) or innovative energy-efficient equipment
- Subsidize for equipment and installation cost
  - **20%** for Designated buildings and factories when replacing with efficient equipment and machinery
  - **30%** for Designated buildings and factories when replacing with efficient equipment and machinery with approved innovative technologies
  - **30%** for non-designated buildings and factories, community enterprise, start-ups, or agriculturers
- **Supports up to 3 million baht per applicant**
- **Payback period no longer than 7 years**

Examples measures

- ❖ **Installing variable speed motors used with the machine.**
- ❖ **Replacement air compressors, high efficiency**
- ❖ **To improve the power factor.**
- ❖ **Replacing high-performance electric motor**
- ❖ **Insulation**
- ❖ **The use of heat pumps**

For further information

https://bit.ly/3bZLmnI

Source: DEDE

2. Financial Incentive – Board of Investment

Smart and Sustainable Industry

Applicable Projects*

- Energy-efficient equipment replacement
- Equipment replacement to utilize renewable energy
- GHG Reduction project (must be certified by TGO**)
- Environmental impact reduction project

Benefits

- Exemption on import duty on machinery
- 3-year corporate income tax (CIT) exemption – 50% of the investment cost

Energy Service Companies (ESCO)

- Provide turnkey solutions for energy efficiency project
- Project implemented can be in the form of guaranteed saving, shared saving, or chauffrage

Benefits

- Exemption on import duty on machinery
- 8-year corporate income tax (CIT) exemption – no CIT exemption cap

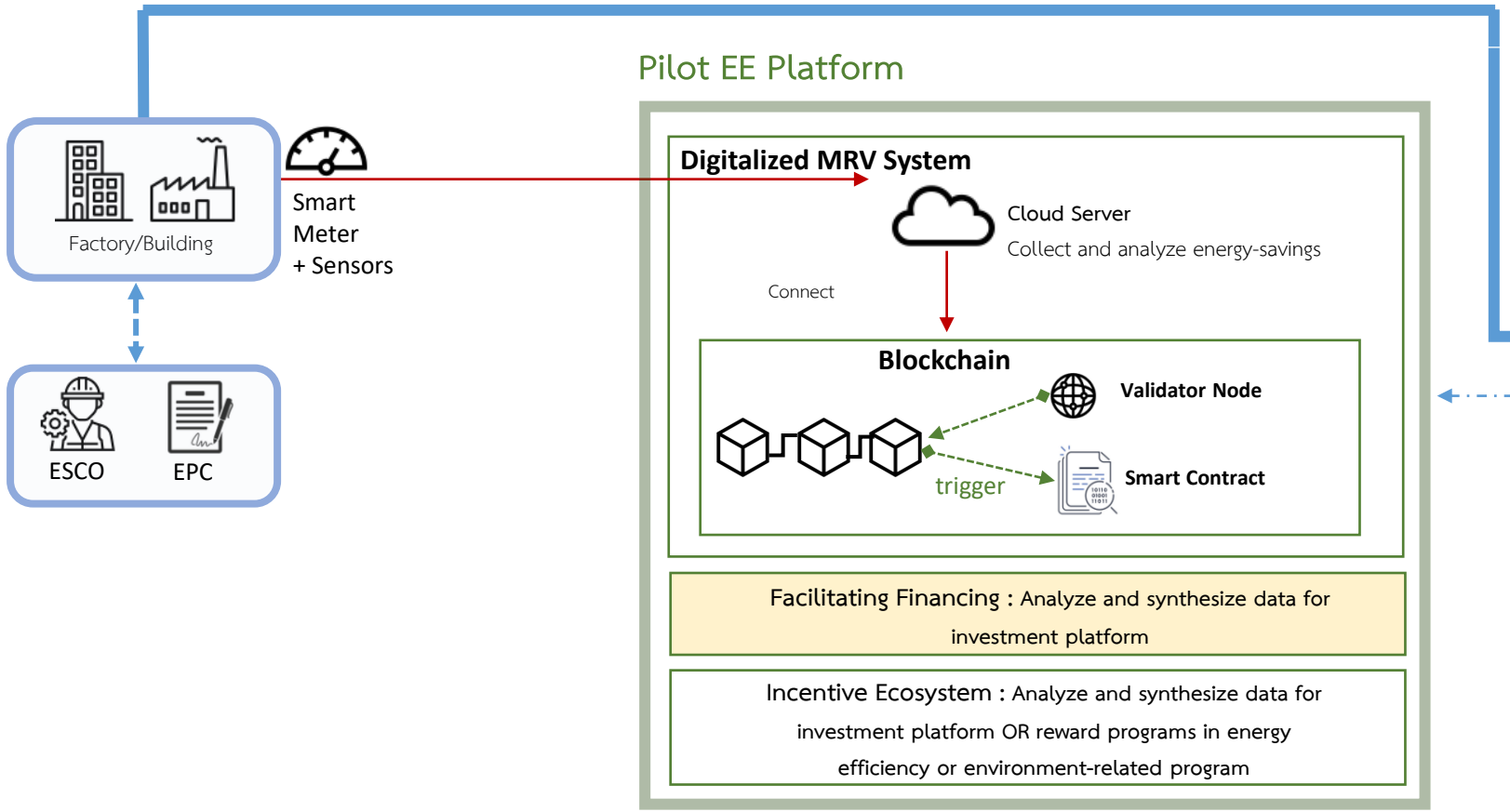
THAILAND BOARD OF INVESTMENT

For further information

*At least 1M Baht in investment (or 500k Baht for SME)

**Thai Greenhouse Gas Organization

Leveraging Private Sector Investment via Energy Efficiency Platform



Not included in EE Platform

1. Database

Bottom-up energy-saving results, Policy decision making, NDC tracking, and reduce Double Counting

2. Private-sector fundraising

Innovative capital-raising methods approved by SEC e.g. ICO (EPC securitization), crowd funding, Hedge funds, etc)

3. EE Reward Programs

Reward programs for further incentivizing investment in energy efficiency projects

4. Promotion of Green Projects

Trading of Energy Saving Certificates to offset energy efficiency target or other related environmental target

EE Platform as a Technical Assistant

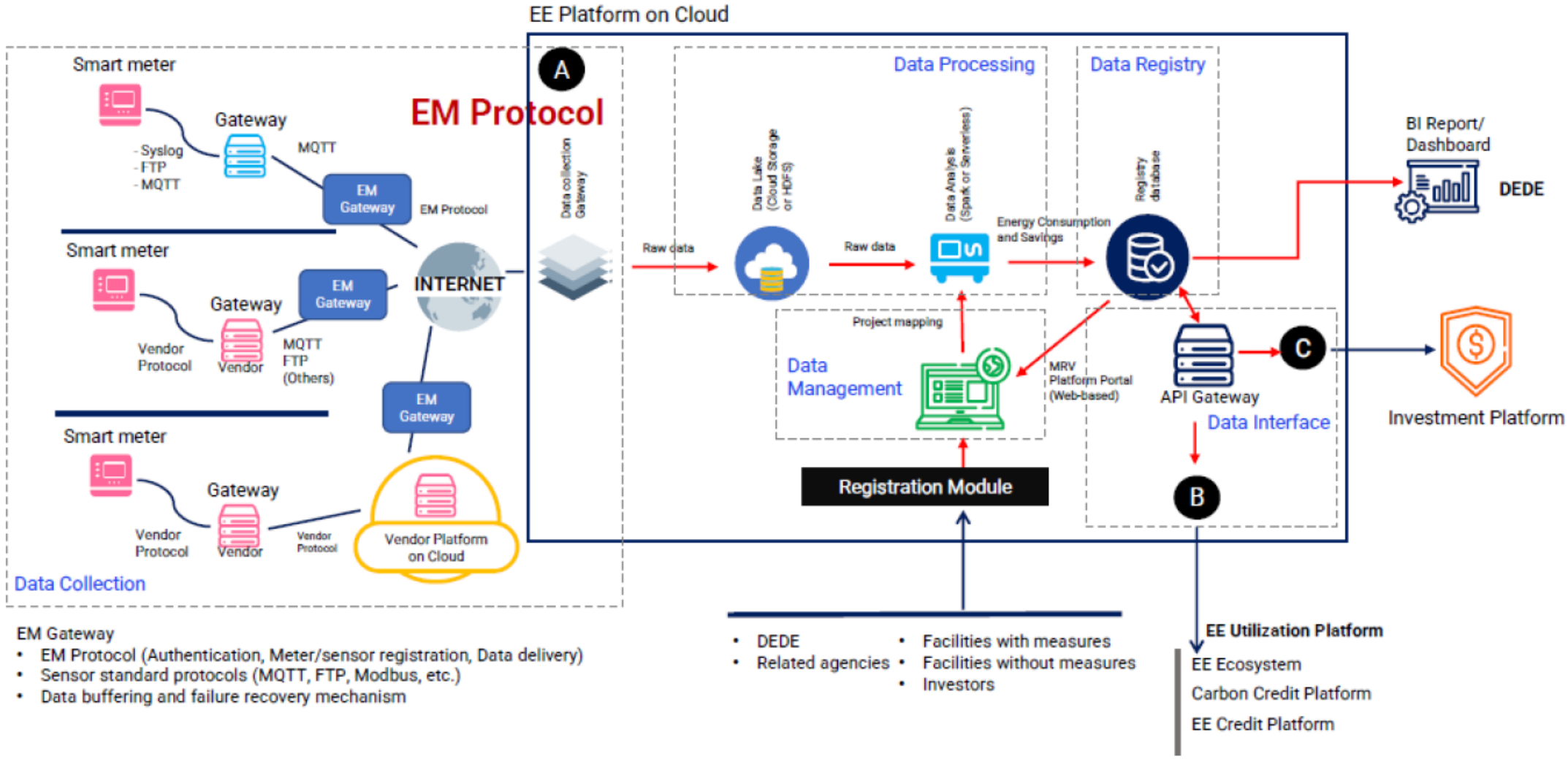
1. To build confidence for investor and reduce the cost of fundraising
2. To oversee technical aspects of energy efficiency projects and MRV process
3. Other technical matters

Currently being implemented

Leveraging Private Sector Investment via Energy Efficiency Platform

Module A: Digitalized MRV

EE Financing: EE Platform



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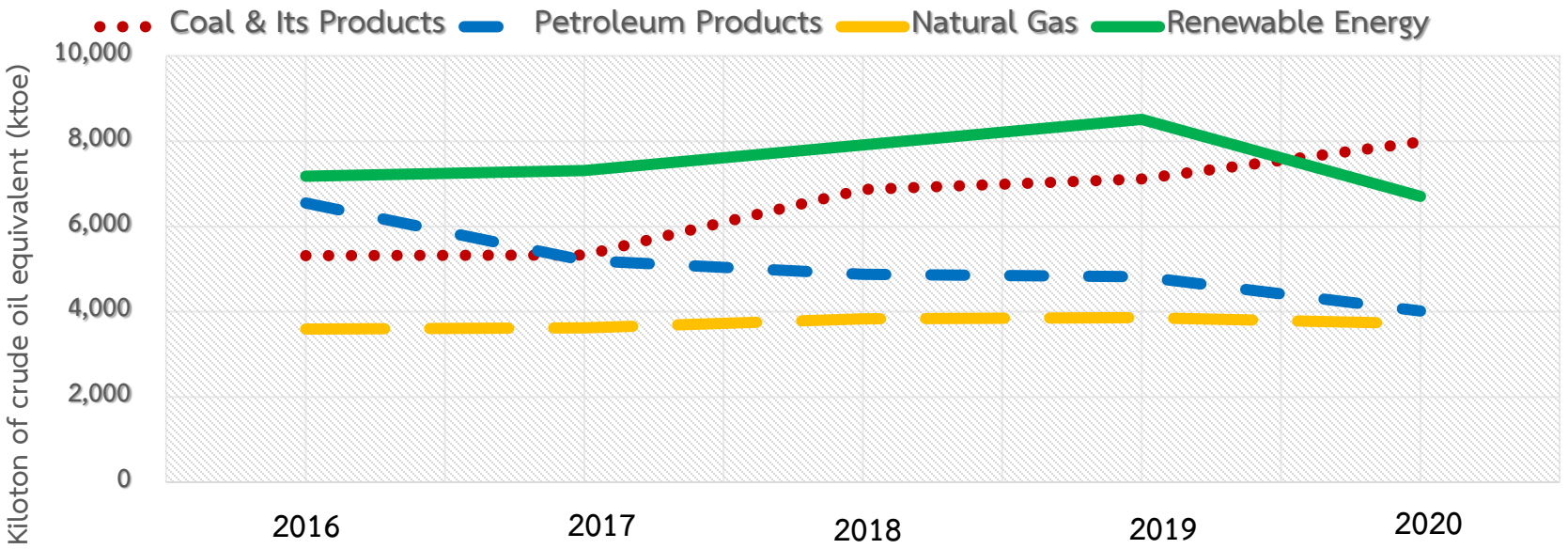
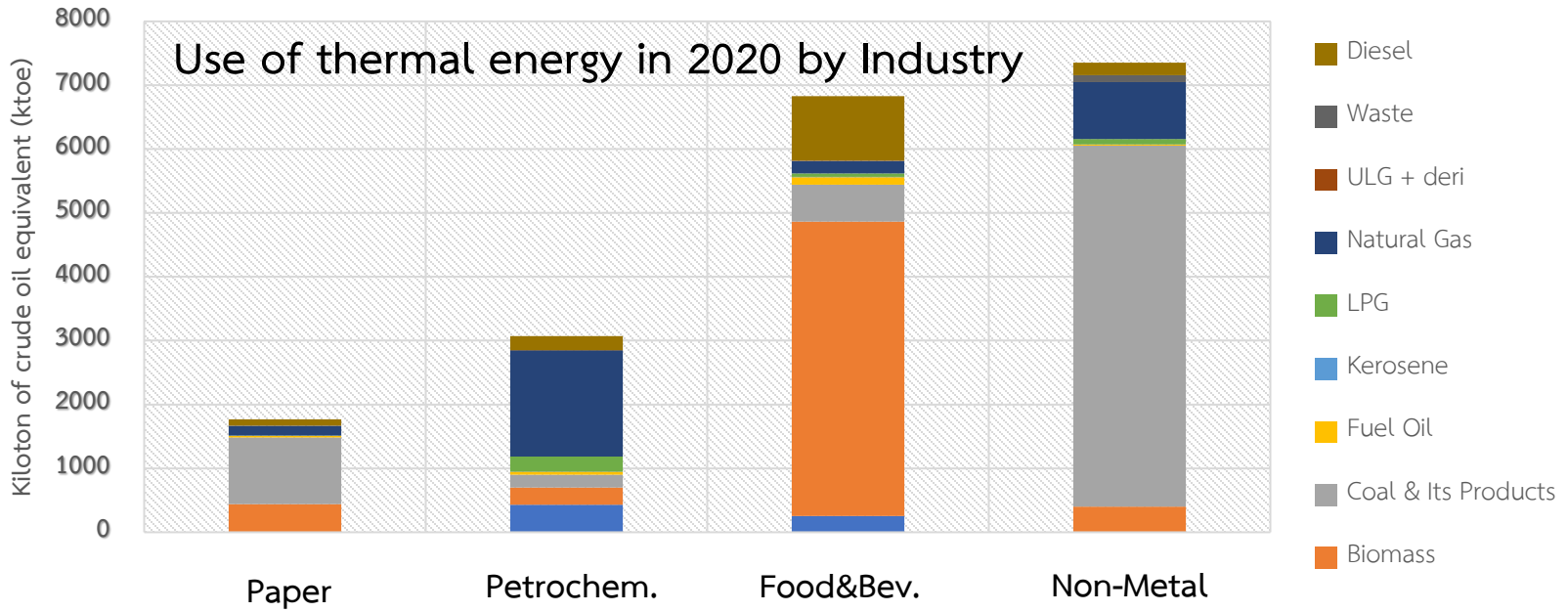
3. Promote equipment utilizing RE



- In 2020, thermal energy of 22,427 ktoe is consumed
- CO_2 Emission ≈ 52.44 $MtCO_2$

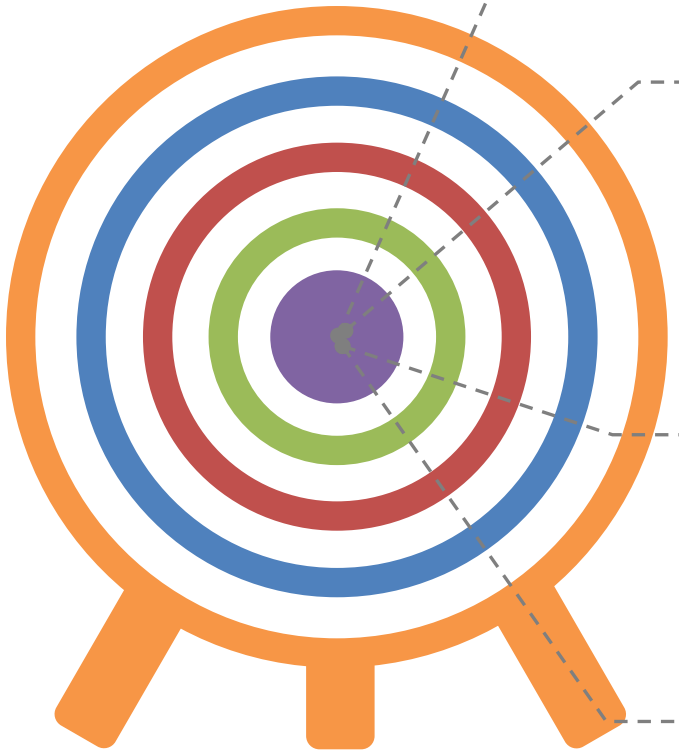
*Carbon neutrality@2050 requires emission of CO_2 = 44.6 $MtCO_2$

- Industry with the **highest renewable energy utilization is Food Beverage and Tobacco** such as sugar factory and palm oil factory
- Industry with the **highest Thermal Energy Consumption is non-metal industry** such as cement industry
- Industry with the **highest potential to replace thermal energy consumption with renewable energy is non-metal and paper industry**, replacing consumption of coal



Source: Thailand Energy Balance 2020, DEDE

3. Promote equipment utilizing RE – cont.



Carbon Tax

❖ Suitable carbon tax policy must be implemented

Financial Support

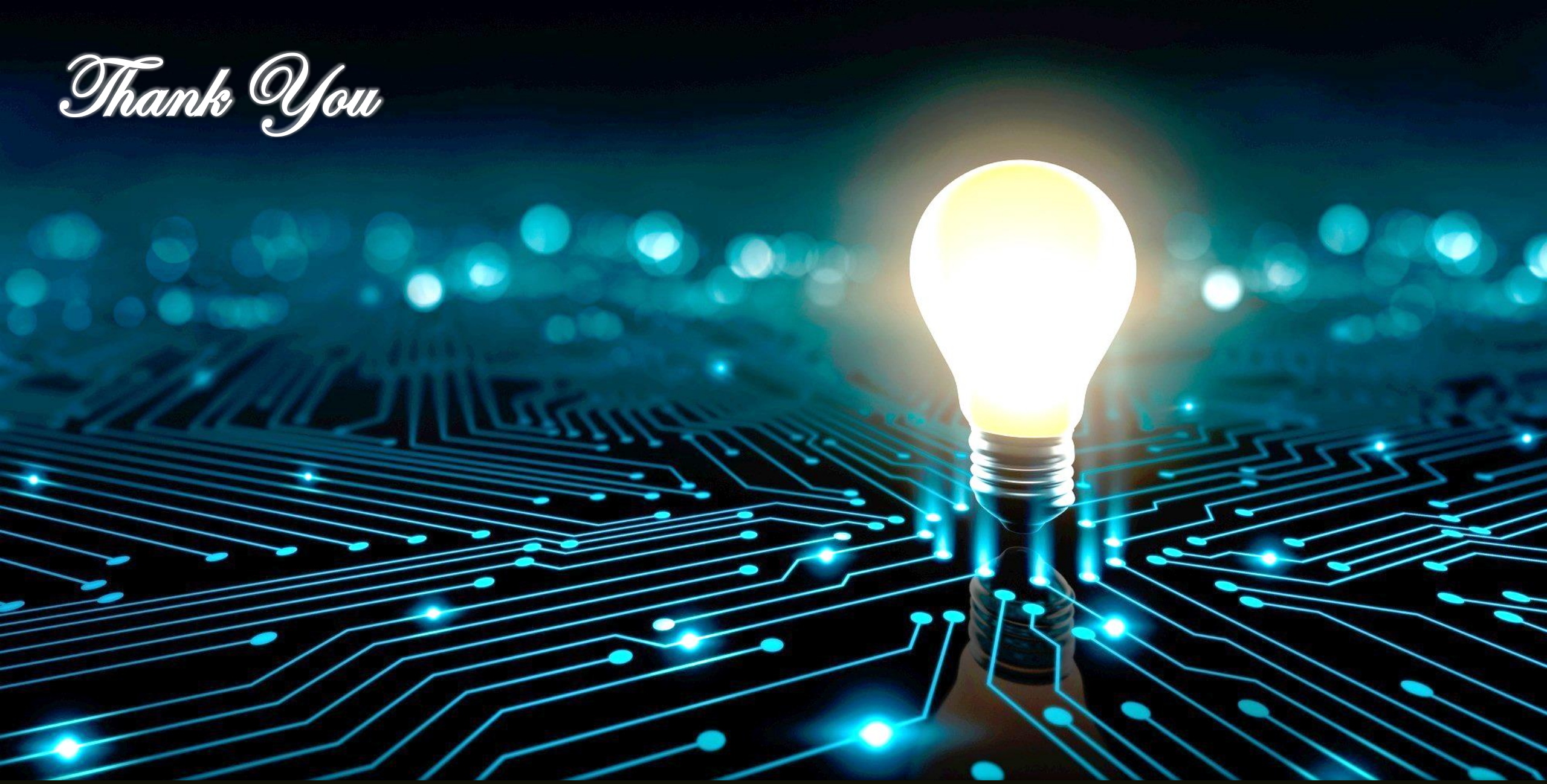
❖ Partial subsidy such as for equipment replacement for manufacturing and utilization of biomass, utilization of equipment for utilization of RDF

Promote plantation of energy crops

❖ Promote additional plantation of energy crops as the feedstock for industry and power plants, which require collaboration between different stakeholders

Promotion of Technologies and Innovation

❖ Promote the development and deployment of various innovative technologies such as CCUS and hydrogen in industries



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