

The direction of **ELECTRICITY POLICY** in Thailand

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Thailand's Power Development Plan (PDP)



Thailand's Power Development Plan (PDP)

- National master plan for the development of power system in Thailand, which includes the development of new power plants in the country, the development of power transmission systems and the purchase of electricity from neighboring countries.**
- The aims are to create stability and adequacy for electricity and to encourage economic growth, social progress and quality of life of people.**

■ ■ ■ Thailand's Power Development Plan 2018-2037 Revision1 (PDP2018 Rev.1)

Reasons for revising of PDP2018

-  To adjust the target of renewable energy power plants to be in accordance with the new Alternative Energy Development Plan (AEDP) including the new community power plant policy.

Note : Use the concepts and assumptions according to the previous PDP (PDP2018)

Preparation of Long-Term Electricity Demand Forecast

The
Essence
of
PDP2018
Rev.1

Taking into account
technology trends

- Independent Power Supply: IPS
- Disruptive technology
- Prosumer Market
- Development to Smart Grid System

Balancing
the Security of
Power System

- Ensure the Regional Security, especially in the Metropolitan area
- Grid Flexibility to support RE
- Grid Connection to Neighboring Countries
Such as East-West Corridor, LTM, ASEAN Power Grid

Community
Power Plant Policies

- Promote self-sufficient Power Generation on Community Scale
- Increase opportunities and generate revenue for the community

In accordance with
Paris Agreement (COP21)

- Promote RE /Bio Circular Green
- Promote EE
- Minimize Coal-fire Power Plant



Regional Power Supply Allocation

Utilize the fuel resources and infrastructure potential available in each region, Reduce additional investment

Increase Power Plants in Metropolitan areas to reduce dependency the power from other regions

Reduce Long-term Contract commitments, regarding Disruptive Technology

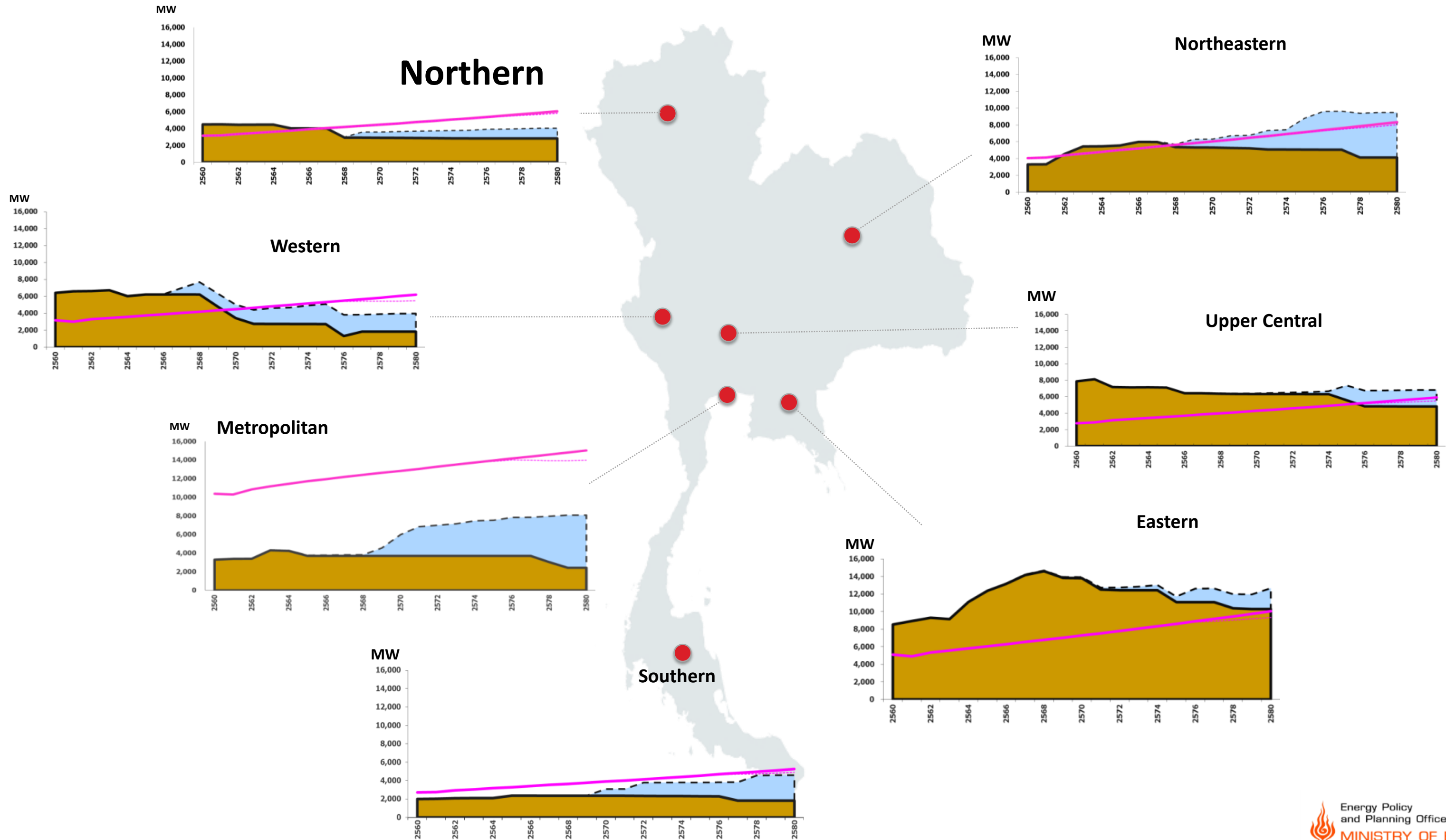
Maintain the security of power supply (in each region)

Minimize the redundant investment in power system

Regional Power Plant Allocation



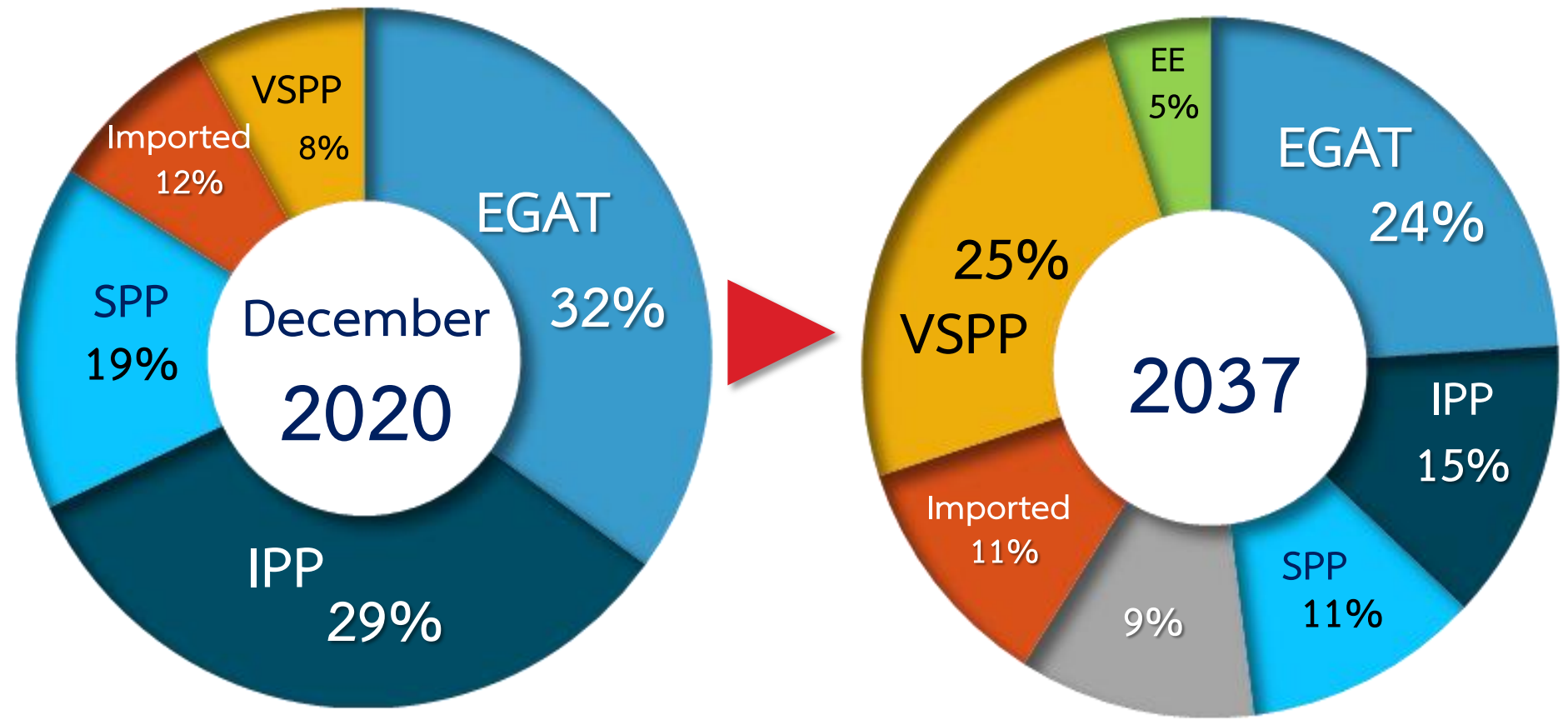
Existing Supply
New Supply



Security Power Supply

Power Generation (2018-2037)

| | |
|---|----------------------|
| Existing Capacity as of December 2017 | 46,090 |
| Retired Capacity during 2018-2037 | -25,310 |
| New Capacity during 2018-2037 | 56,431 |
| Power Generation in 2037 (Classified by Power producer) | <u>77,211</u> |



New Power Plant/
Replacement



PDP2018 Rev.1 Summary

Power Plant in accordance with Government Policy

| | |
|-----------------------|-------|
| MSW | 400 |
| Biomass | 120 |
| Community Power Plant | 1,933 |
| <hr/> | |
| Total | 2,453 |

Power Plant in accordance with new AEDP

| | |
|-----------------------------|--------|
| Solar | 8,740 |
| Biomass | 2,780 |
| Biogas | 400 |
| Hydro-Floating Solar Hybrid | 2,725 |
| Wind | 1,485 |
| Industrial Waste | 44 |
| Small Hydro (EGAT) | 69 |
| <hr/> | |
| Total | 16,243 |

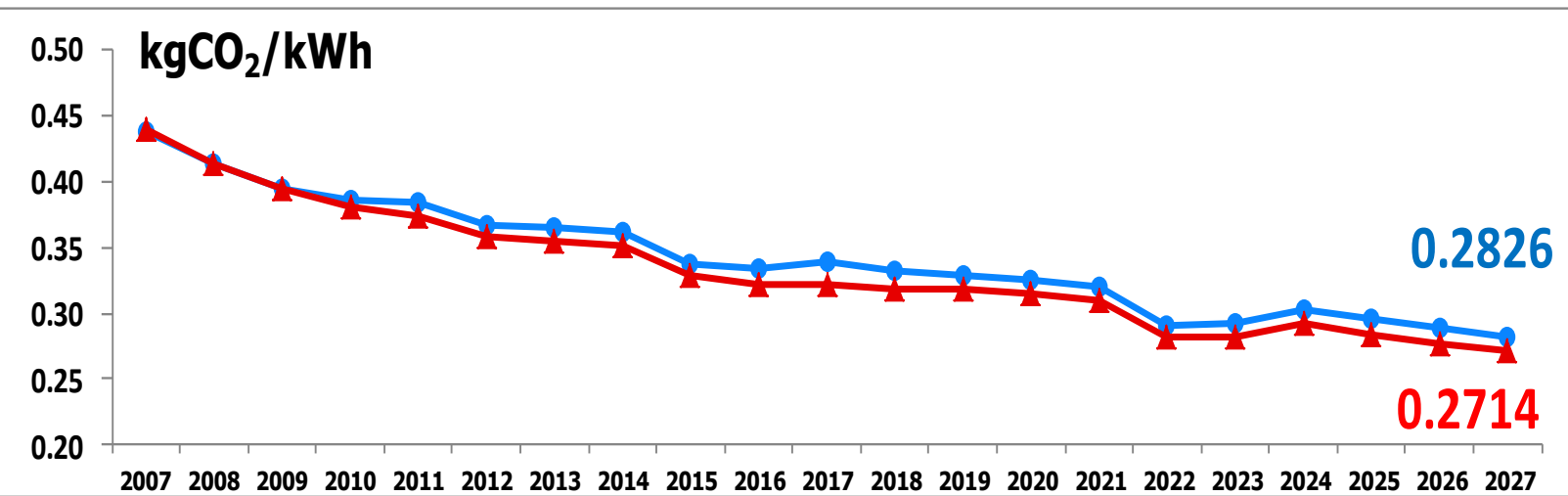
Unit : MW

New Power Generation (2018-2037)

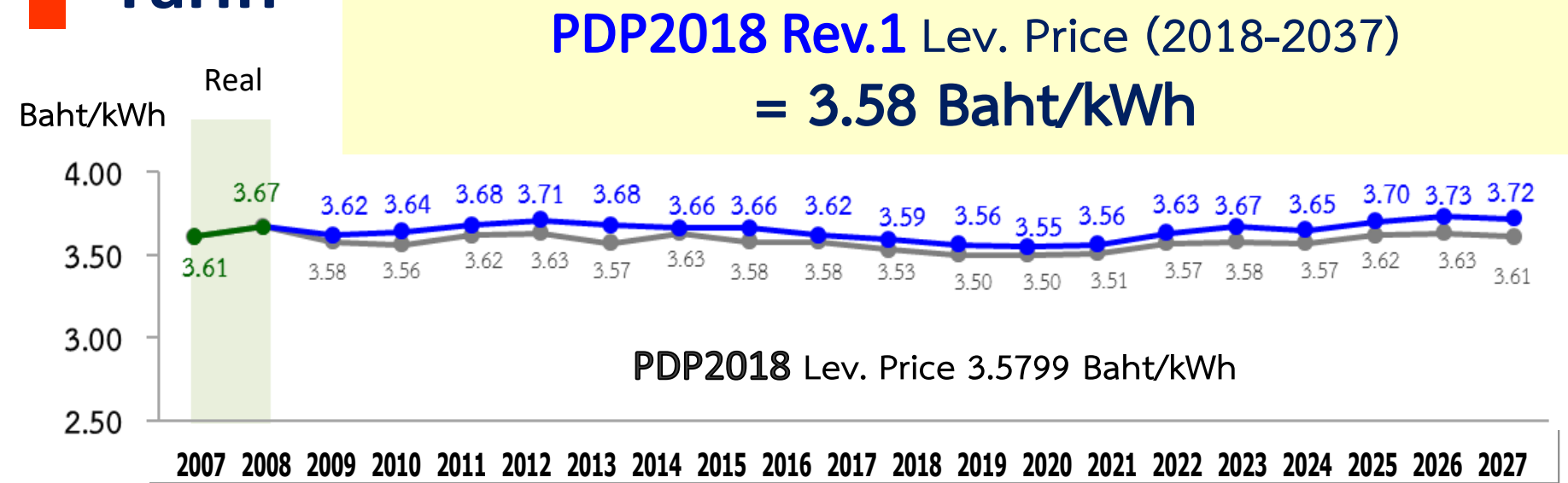
| | |
|--------------------------------|--------|
| RE | 20,766 |
| Pumped Storage | 500 |
| SPP-Cogeneration | 2,112 |
| Combined Cycle | 15,096 |
| Import Coal/Lignite | 1,200 |
| Import Hydro | 5,857 |
| New Power Plant/Replacement | 6,900 |
| EE | 4,000 |
| <hr/> | |
| Total | 56,431 |

PDP2018 Rev.1 Summary

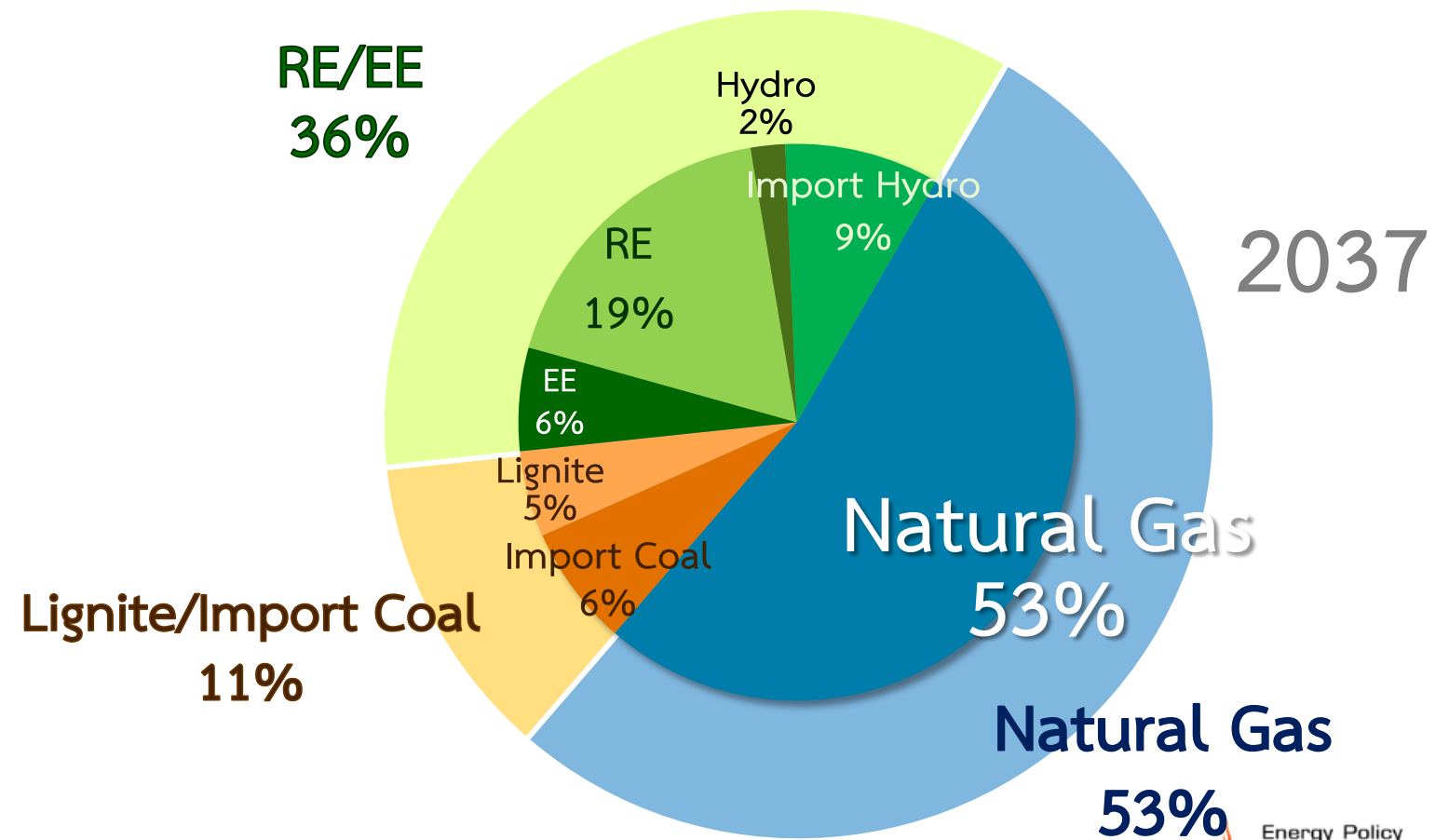
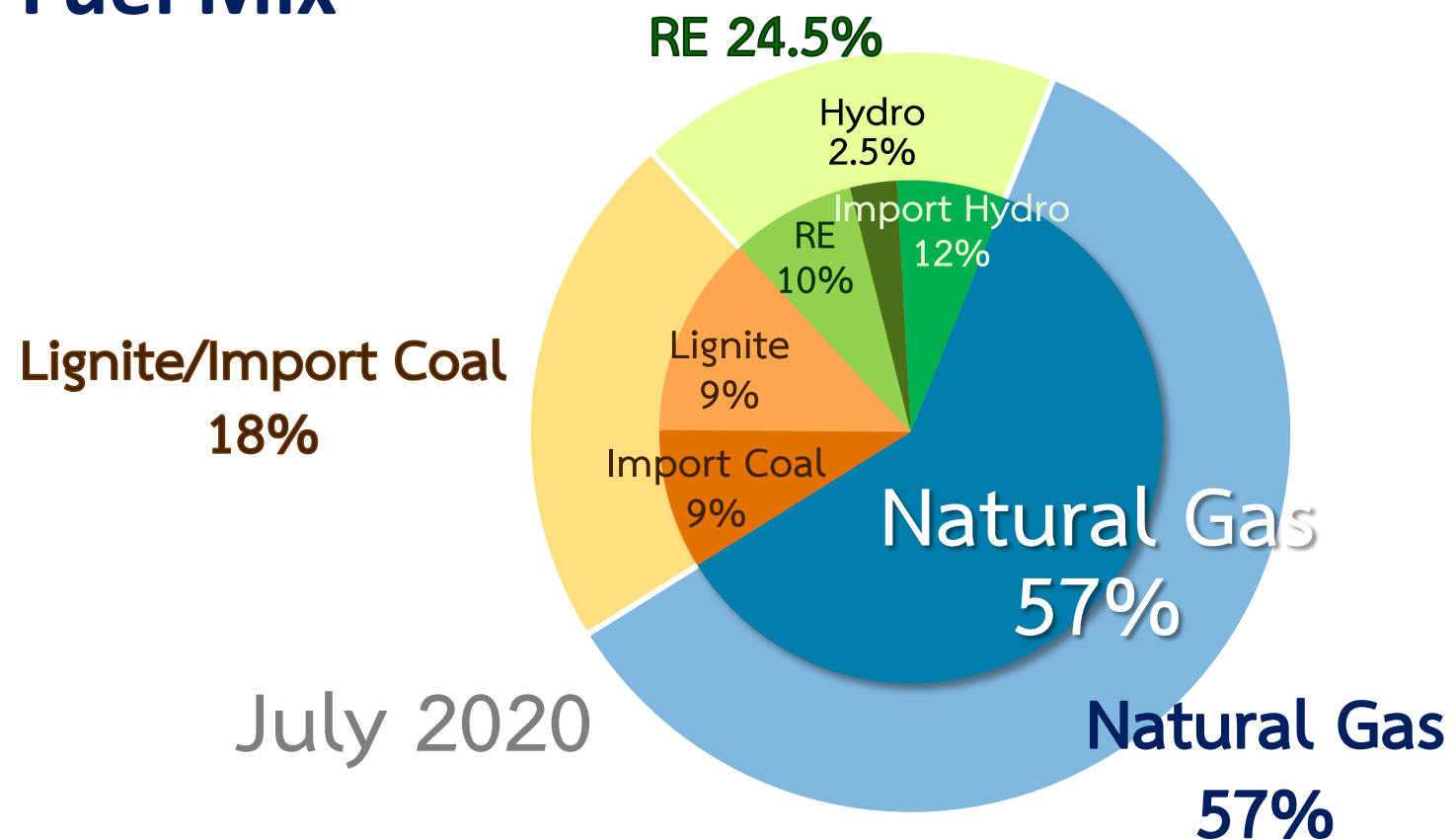
CO2 Emission



Tariff



Fuel Mix



Thailand's Energy Direction



Energy Transformation

4D1E



DIGITALIZATION



DECARBONIZATION



ELECTRIFICATION



DECENTRALIZATION



DE-REGULATION

Distributed energy resources enabled by big data-driven alignment of supply and demand

Data-driven asset strategies including preventative and condition-based maintenance and predictive outage

Smart grid and smart pipes allow automated controls to improve network resiliency, safety, and efficiency

Customer interactions governed by analysis of customer journeys, segmentation, and personalized communication

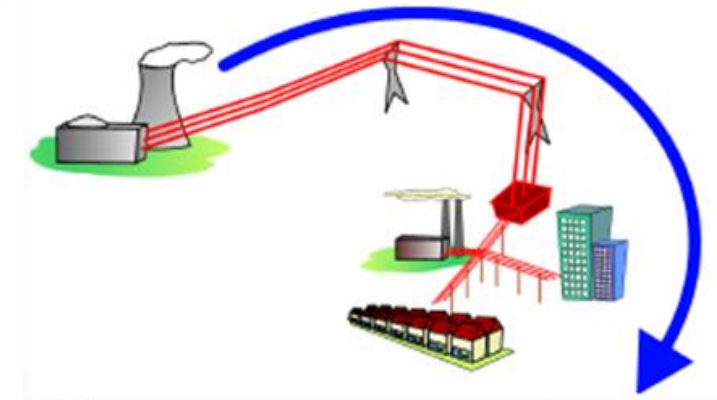
Platform supports distributed energy resources and marketplaces



Differences between Conventional Grid & Future Grid

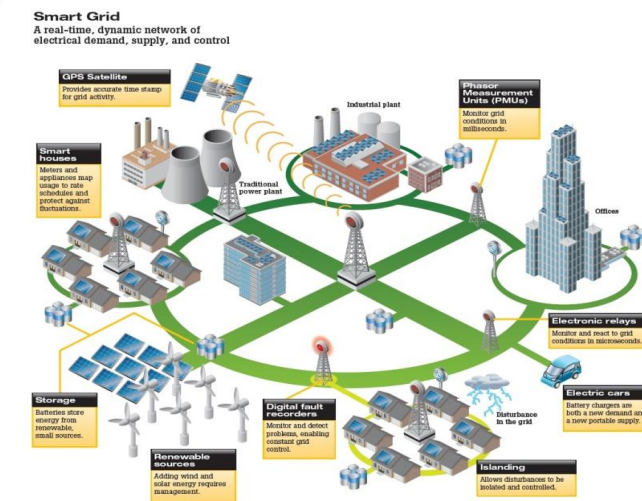
Conventional Grid

- One-way electricity flow from generating sources to consumers.
- No exchange of data on generation and consumption.
- Limited participation of consumers in electricity management.

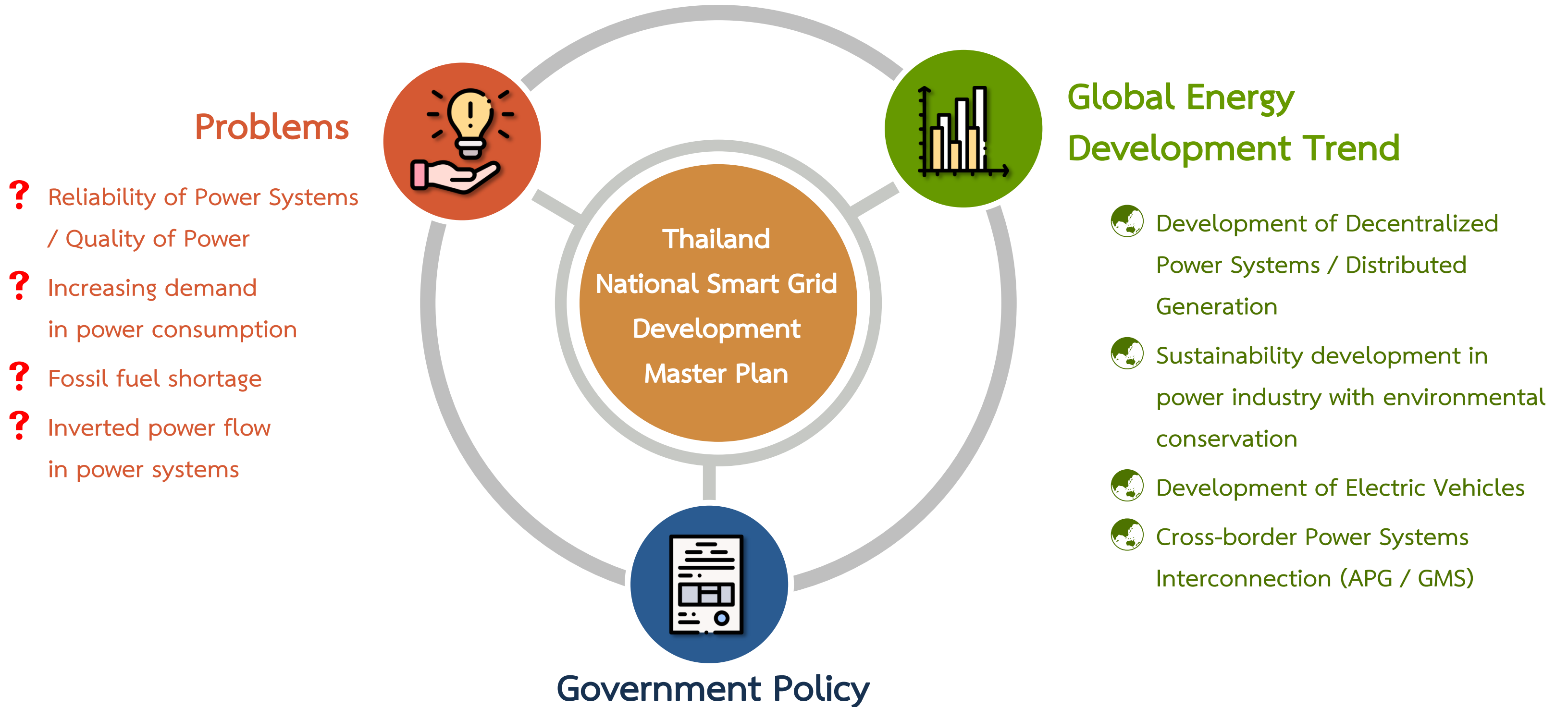


Future Grid (Smart Grid)

- ↔ Two-way flow of electricity and data.
- ↔ Data on generation and consumption is efficiently utilized via ICT.
- ↔ Broad participation of consumers in electricity management.



Key Drivers for Thailand Smart Grid Development



- ★ National Economics and Social Development Plan
- ★ Power Development Plan (PDP)

- ★ Energy Efficiency Plan (EEP)
- ★ Alternative Energy Development Plan (AEDP)

- ★ Load Forecast

■ ■ ■ Policies and plans

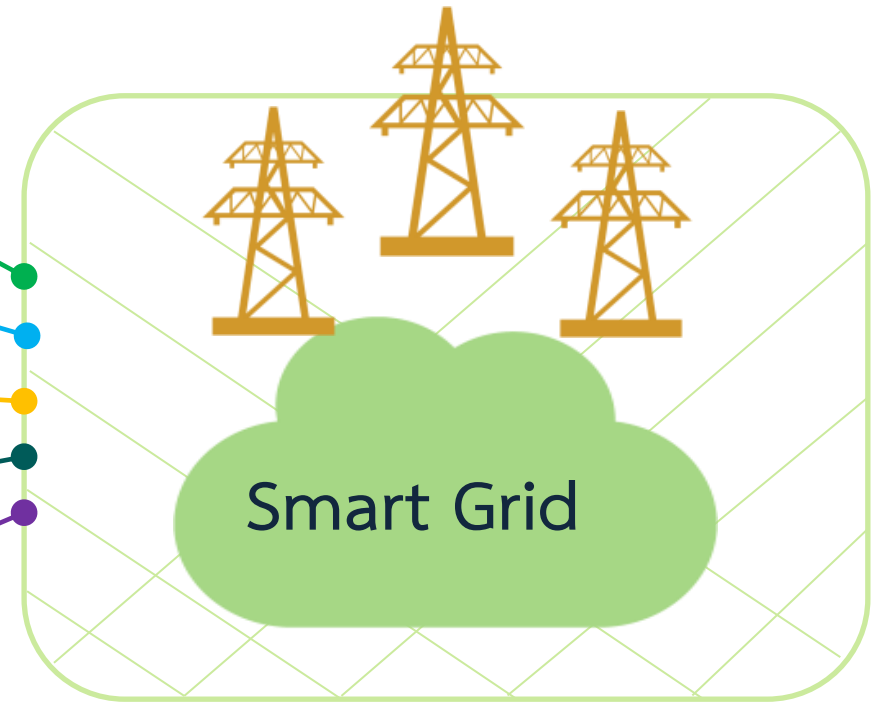
Smart Grid plans connect to Execution of the TIEB plan



Smart Life



Smart System



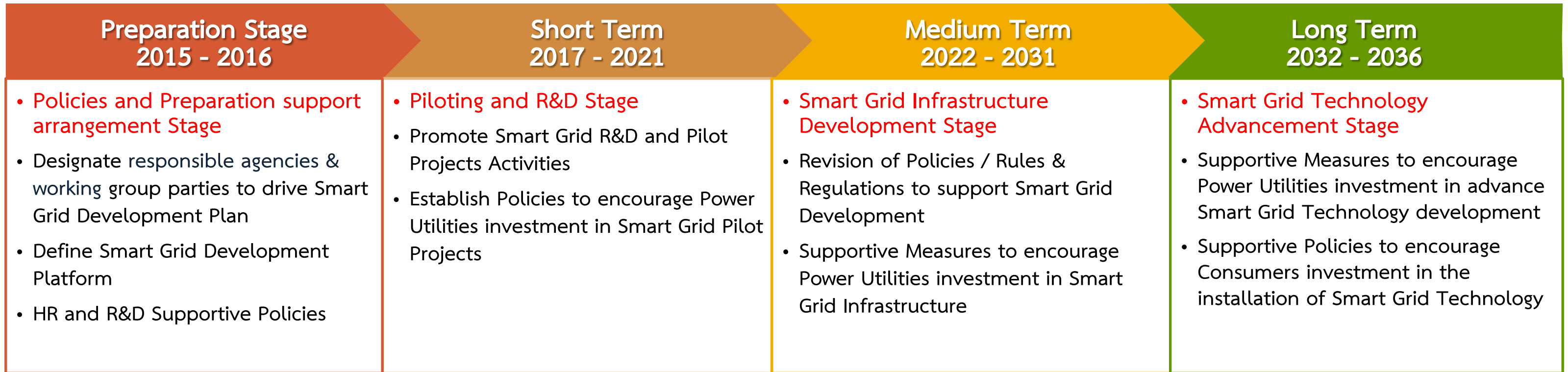
Green Society



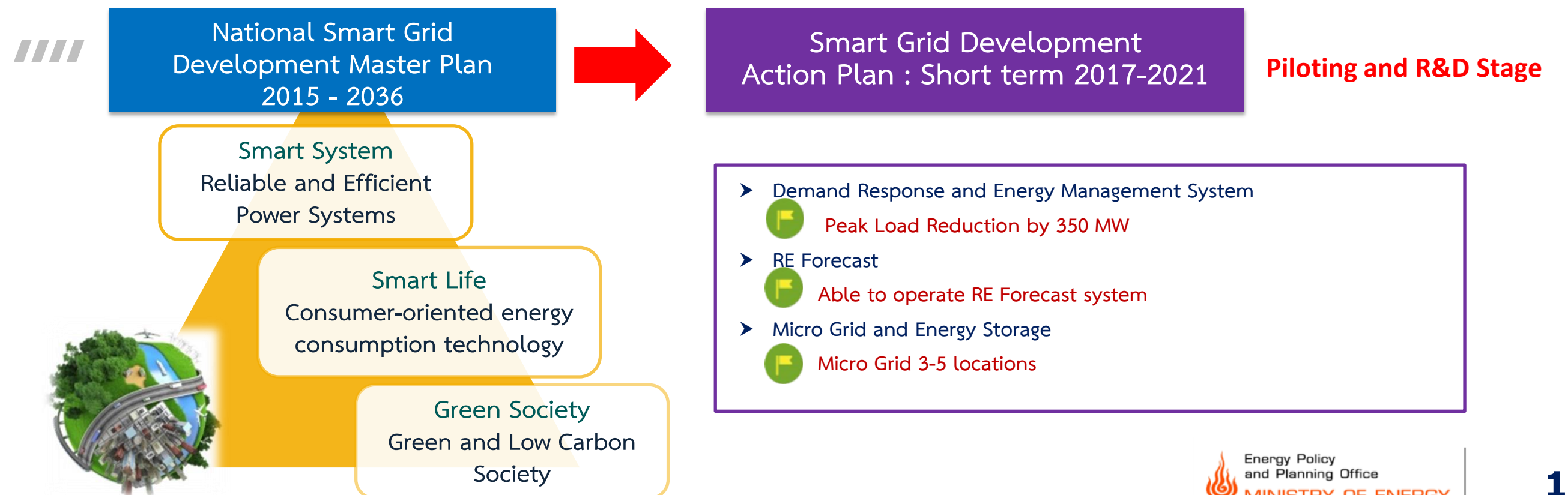
Supporting Energy Transformation

Thailand Smart Grid Development Work Plan

Thailand National Smart Grid Development Master Plan 2015 - 2036



Current Progress

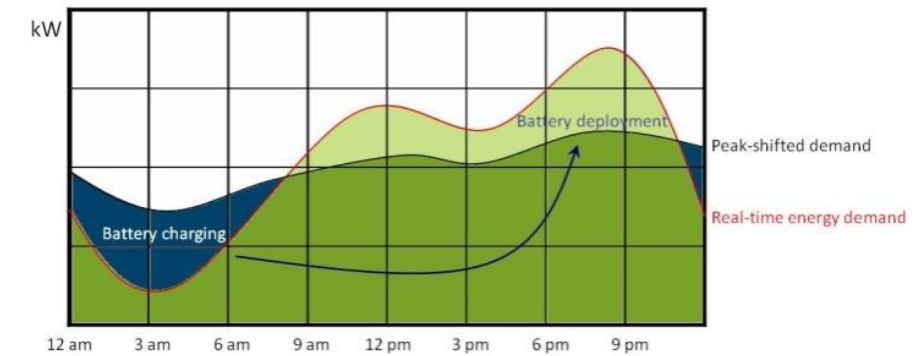


Benefits of Smart Grid Development

Smart System *Reliable and Efficient Power Systems*

- Reduce the amount and number of Reserved Power Plants / SAIFI / SAIFI and Power Loss in both Transmission and Distribution Systems

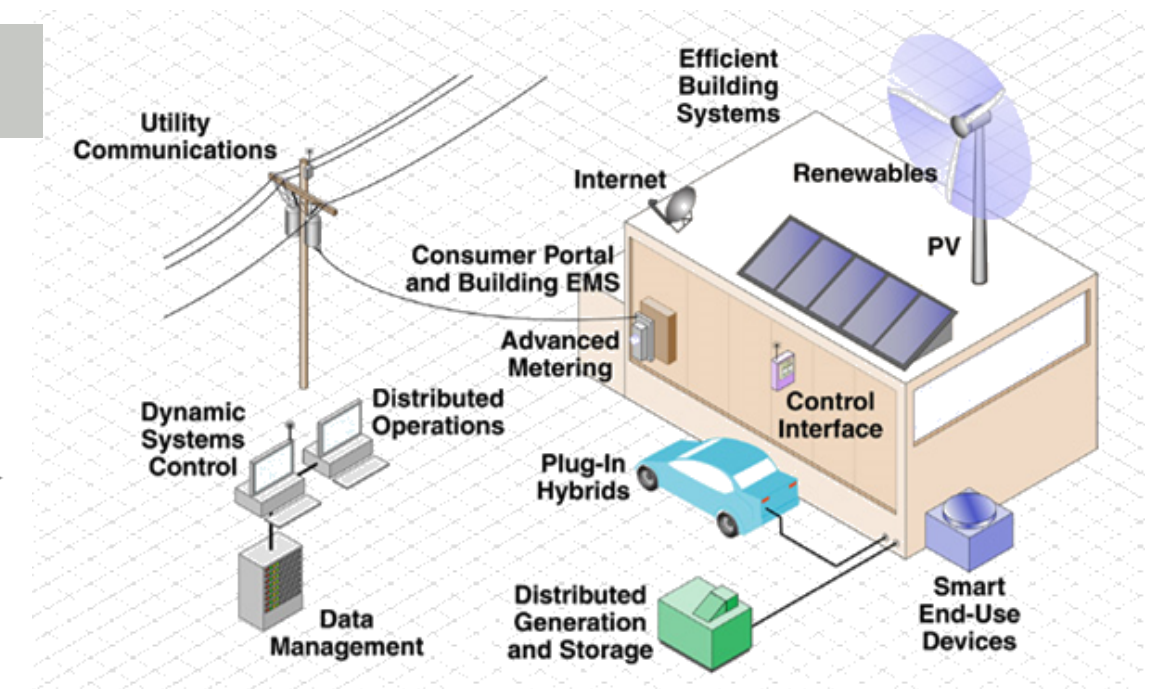
Demand Response & Peak Management



Smart Life *Consumer-oriented Energy Consumption Technology*



- Smart Appliances
- EV
- EMS / DR / DSM
- Smart Billing



Green Society *Green and Low Carbon Society*

- Increase the proportion of power generated from RES into the Power Systems at least 15%
- Promote Micro Grid Development in Community Level to support sustainable energy development





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