

Thailand Energy Situation and Energy Plan

Department of Alternative Energy
Development and Efficiency (DEDE)

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- **Thailand Energy Situation**

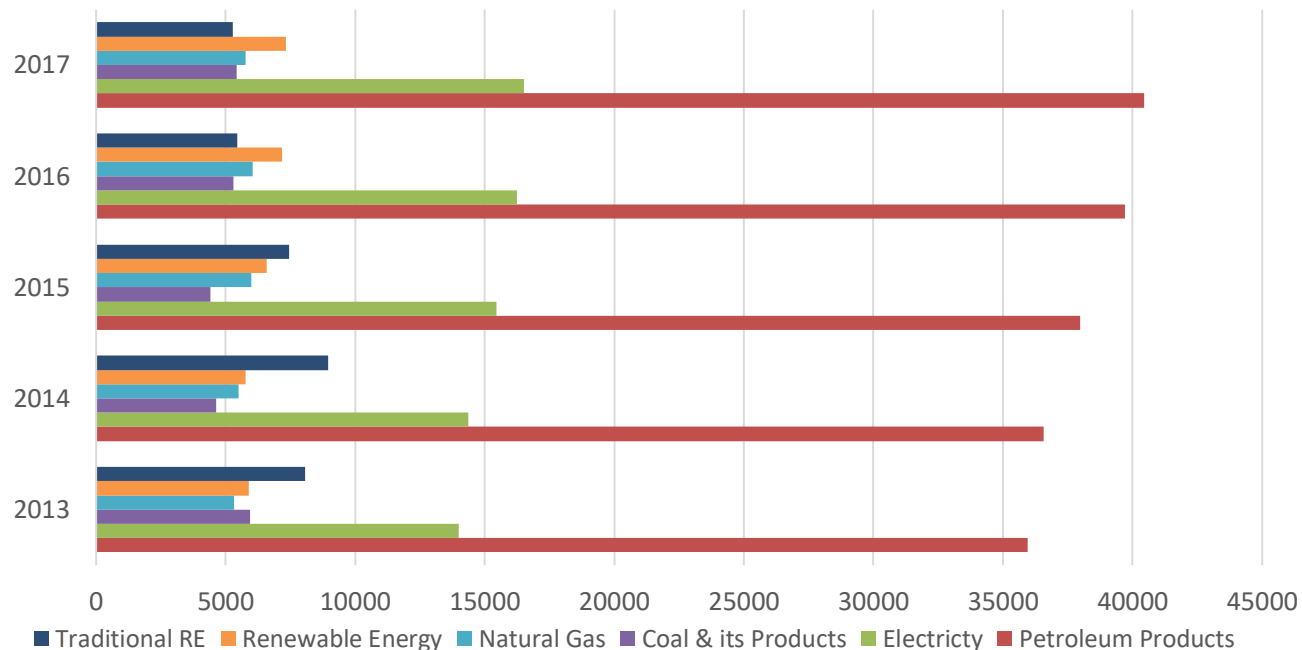
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- **Alternative Energy Development Plan (AEDP 2015)**

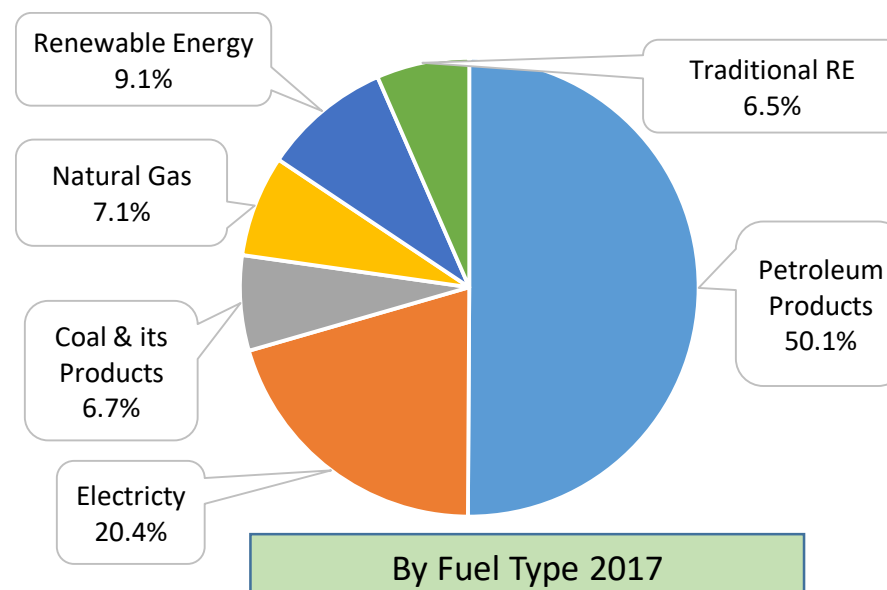
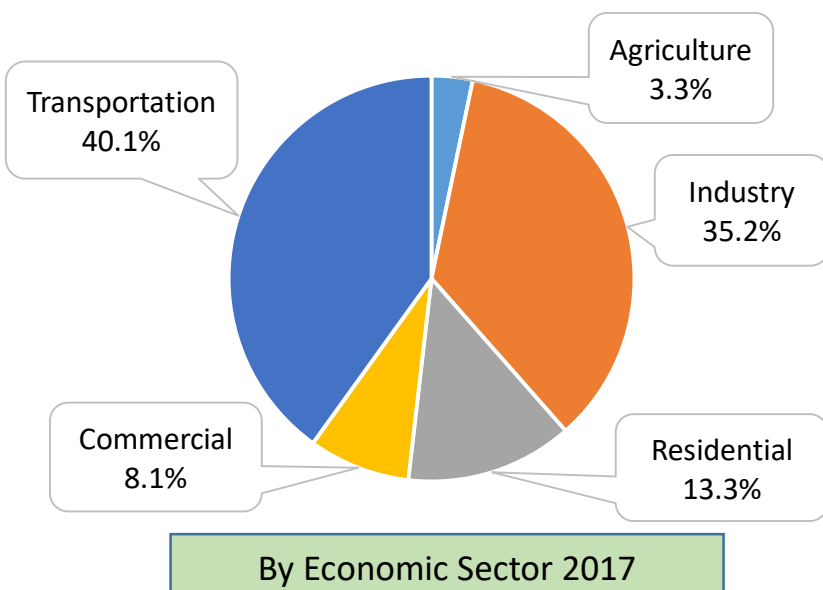
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- **National Energy Reform**

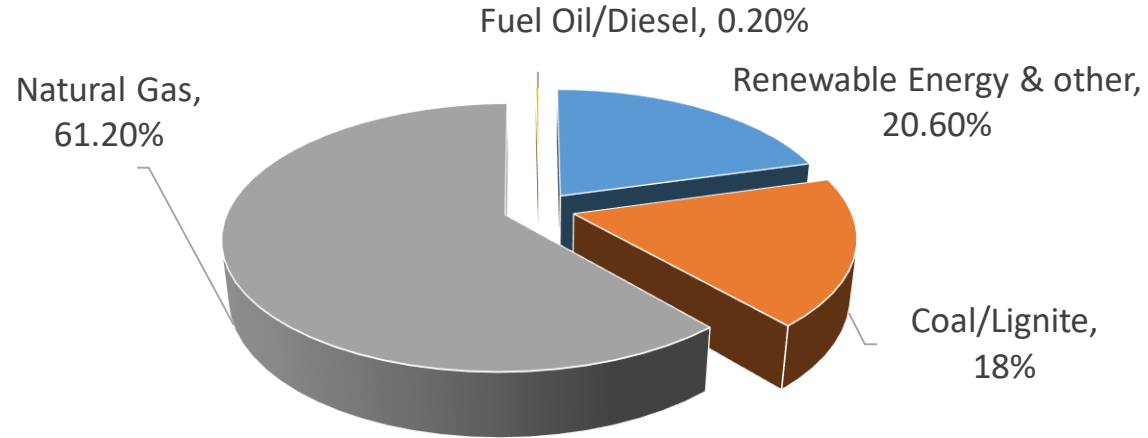
Final Energy Consumption



	2013	2014	2015	2016	2017
Final Energy Consumption	75,214	75,804	77,881	79,929	80,752
Commercial Energy	61,236	61,075	63,844	67,296	68,144
Petroleum Products	35,948	36,570	37,981	39,714	40,451
Electricity	14,002	14,371	15,455	16,233	16,505
Coal & its Products	5,947	4,629	4,403	5,313	5,423
Natural Gas	5,339	5,505	6,005	6,036	5,765
Renewable Energy	5,902	5,775	6,579	7,182	7,322
Traditional RE	8,076	8,954	7,458	5,451	5,286



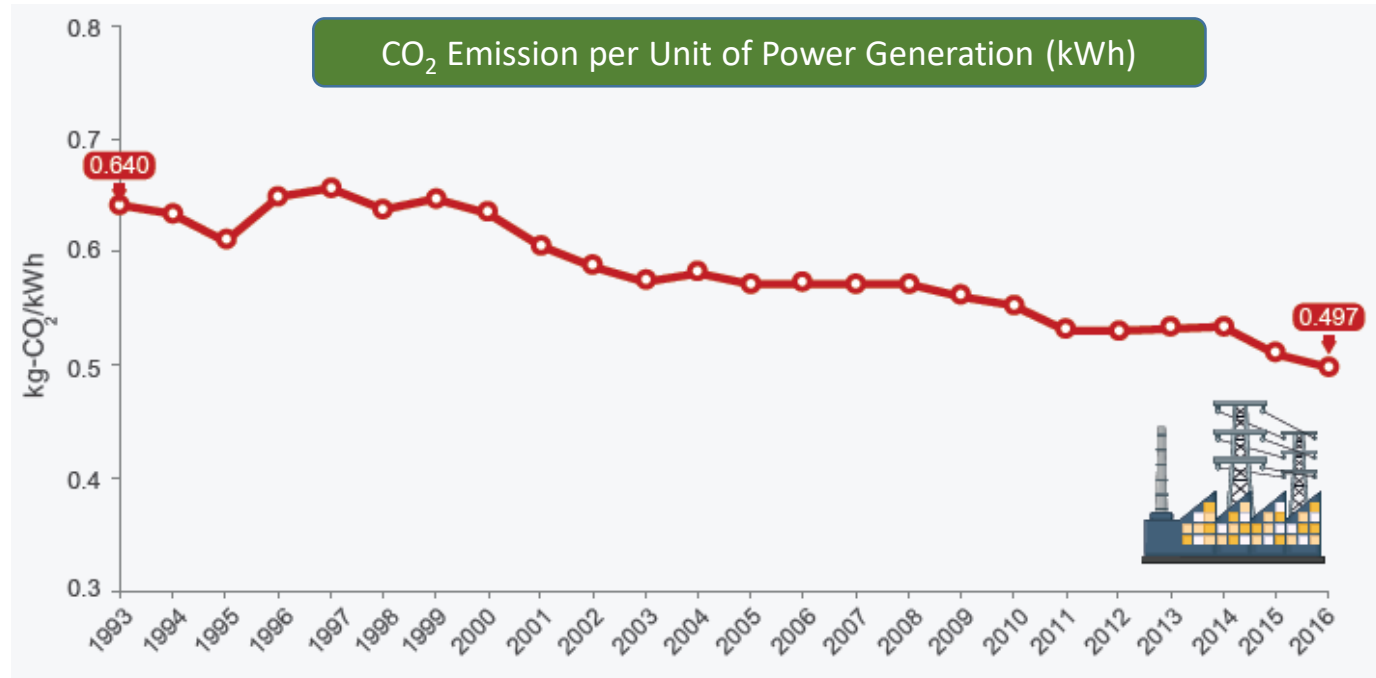
Share of Fuel for Electricity Generation 2017



**Share of Fuel Consumption for Electricity
Generation 2017**

Renewable Energy/ other Energy	20.6%
Coal/ Lignite	18%
Natural Gas	61.20%
Fuel Oil/ Diesel	0.2%

Source : DEDE



Source : EPPO

Thailand Integrated Energy Blueprint

Security

Economy

Ecology

EEP



- **Reduce Energy Intensity (EI) by 30% in 2036** in comparison with 2010
- **Accelerate EE execution via 3 strategies:** 1) Compulsory
2) Voluntary
3) Complementary

PDP



- **Fuel Diversification:** reduce reliance on natural gas and increase the share of renewable energy, clean coal technology and power purchasing from neighboring countries
- **Research:** Smart Grid, EV etc.

AEDP



- **Increase the share of renewable energy to 30% by 2036**
- **Target by energy type:** 1) Power generation: ~ 20% of electricity substitution
2) Heat: ~ 37% of heat substitution
3) Biofuel: ~ 25% of fuel substitution

Gas Plan



- **Reduce natural gas demand** in accordance with PDP, EEP & AEDP
- **Extend domestic natural gas supply & LNG Management**
- **Infrastructure for LNG import:** gas pipelines, LNG receiving terminals etc.

Oil Plan



- **Support EE measures (EEP)** in the transportation sector
- **Promote the use of renewable Energy (AEDP):** Biofuels
- **Rebalance fuel mix** by setting appropriate fuel price structures that reflect actual costs



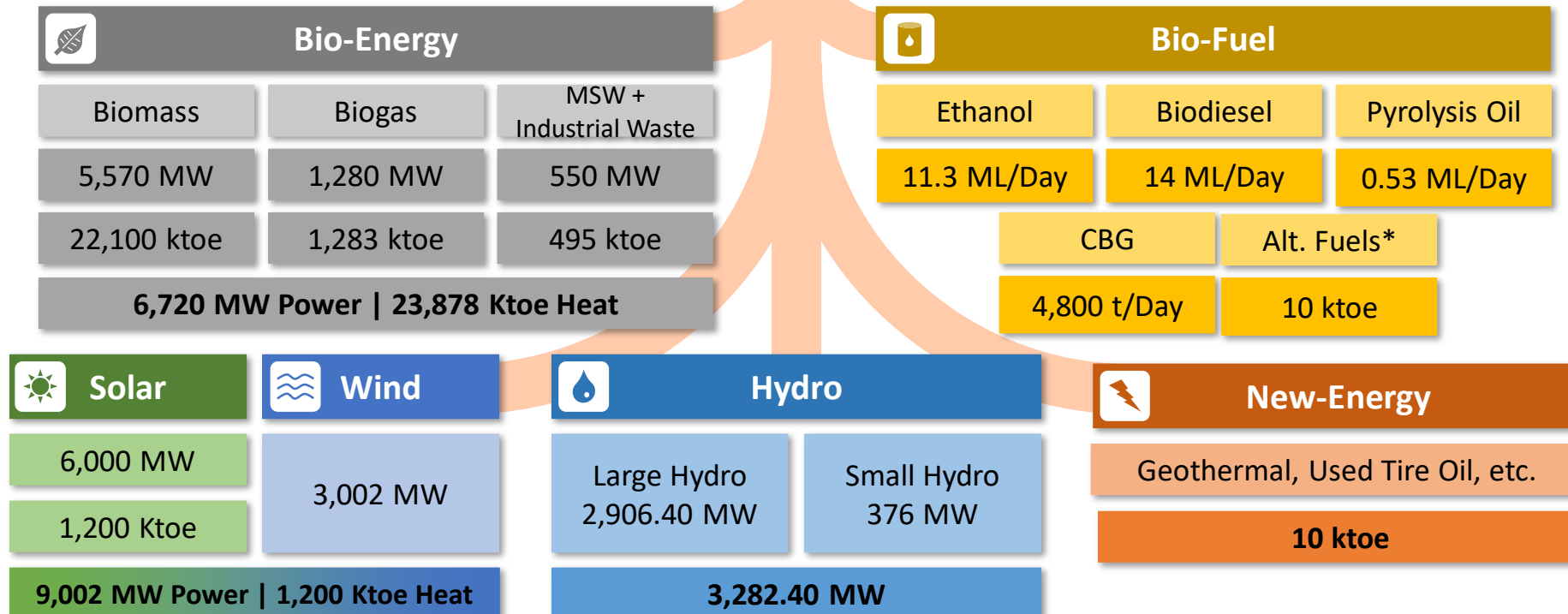
Foundation: Commitment to the development of a low-carbon society

Facilitator:
*Private-led
investment*

Strategy: Alternative Energy
Development Plan 2015-2036

Facilitator:
*Government
funded RD&D*

Goal: *Target 30%* renewables in Total Energy Consumption by 2036



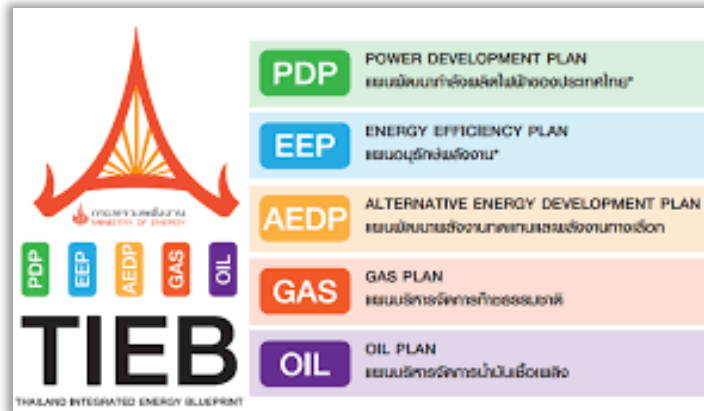
* Alternative fuels = Bio-oil, Hydrogen

**Energy Security
Economic Prosperity
Social Sustainability**

Ministry of Energy came up with Energy 4.0 which is to use energy efficiently and to generate electricity by taking into account cost and service.

At present, a development is made combining the use of clean energy and environmental protection that will lead to energy conservation, clean environment and citizen's happiness.

**Thailand
Integrated
Energy
Blueprint**



Driven by Innovation

**Demand
Response**

**Energy
Management**

**Smart
Grid**

4.0

①

EV

Electric Vehicle



②

ESS

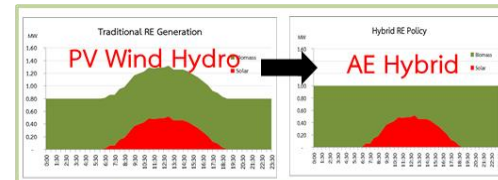
Energy Storage



③

SPP

SPP Hybrid



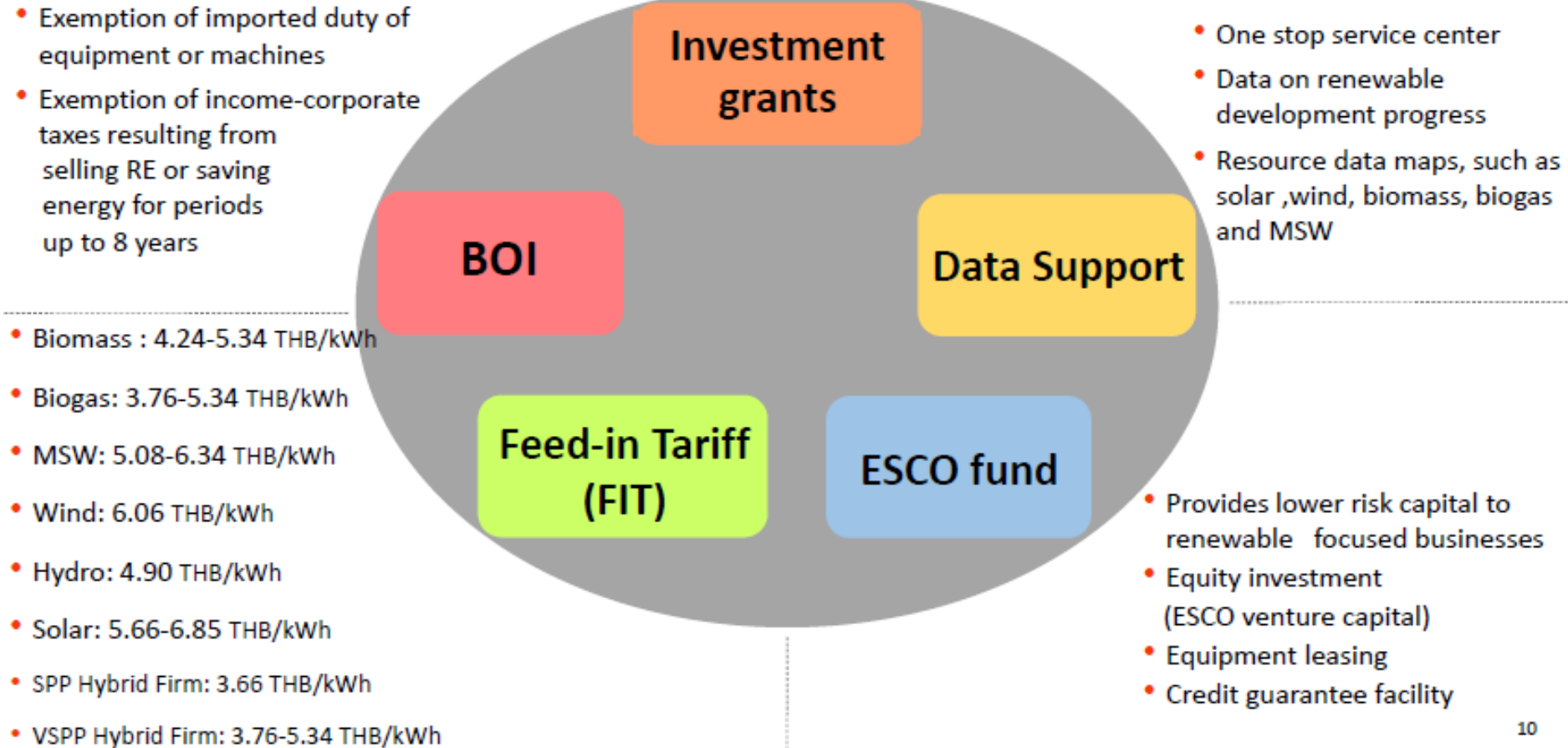
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SC

**Smart City
+
Smart Grid**



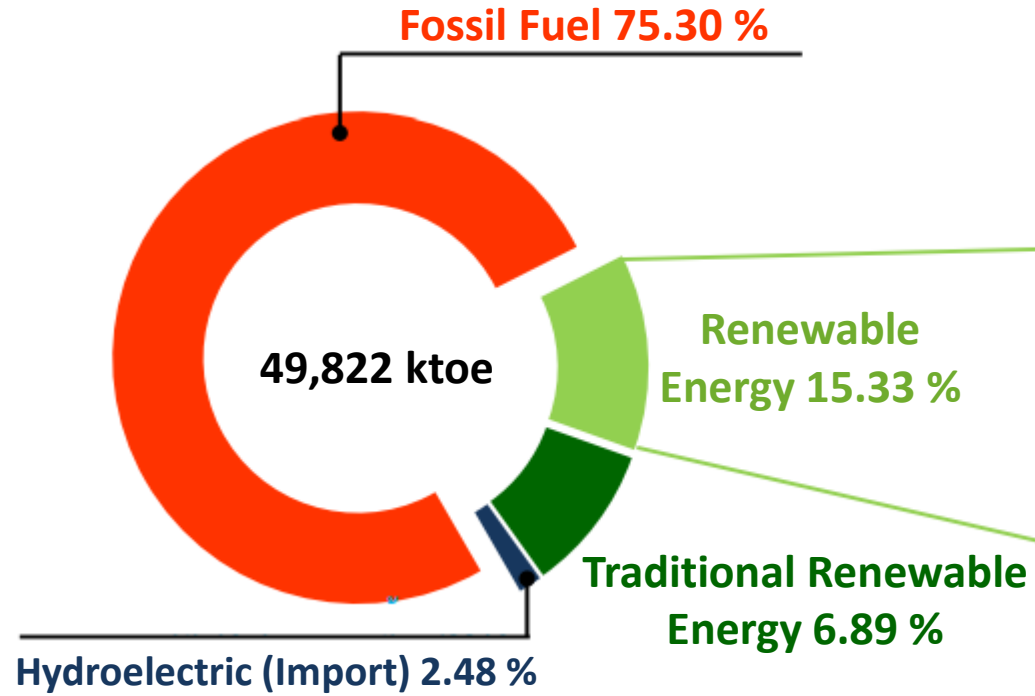
Alternative Energy Promotion Measures



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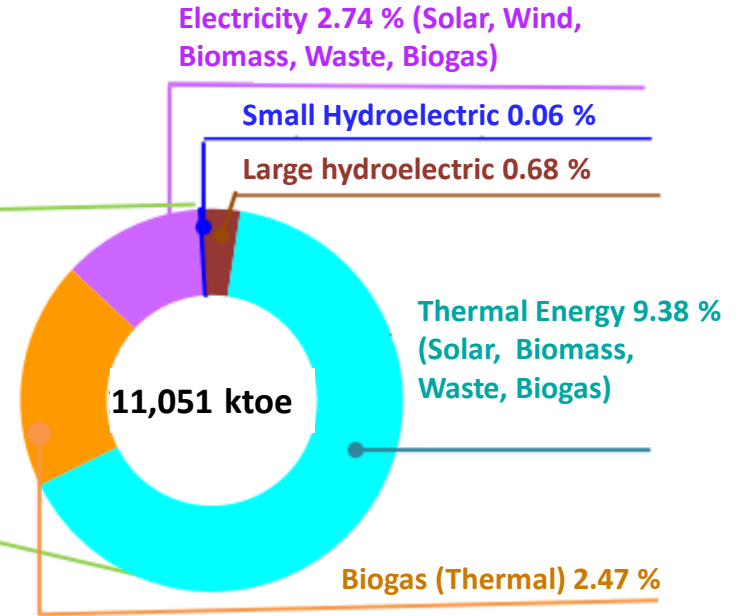


Final Energy Consumption



Renewable Energy

Jan - July 2018



Status of Power Purchase Agreement based on Renewable Energy Sources

Status	SPP			VSPP			Power Plant under DEDE			Total		
	No.	Installed Capacity (MW)	Contracted Capacity (MW)	No.	Installed Capacity (MW)	Contracted Capacity (MW)	No.	Installed Capacity (MW)	Contracted Capacity (MW)	No.	Installed Capacity (MW)	Contracted Capacity (MW)
Proposal Submit, wait for Agreement	0	0	0	0	0	0	0	0	0	0	0	0
Agree to purchase wait for PPA	18	454.14	319.54	0	0	0	33	41.246	40.357	51	495.386	359.897
PPA Signed, wait for COD	16	868.953	719.622	83	416.132	377.2	0	0	0	99	1,285.09	1,096.82
Commercial Operation Date - COD	60	2,730.05	2,176.22	914	4,769.82	3,683.21	19	20.852	19.552	993	7,520.73	5,878.98
Total	94	4,053.15	3,215.38	997	5,185.96	4,060.41	52	62.10	59.91	1,143	9,301.20	7,335.70

Source: ERC website, up to November 2018

Note:

IPP = > 90 MW

SPP = 10 – 90 MW

VSPP = < 10 MW

Overall energy plan revision

Electricity

Share in RE % 4.27 7.68

	July 2018	AEDP2015	AEDP2018
1. MSW	500	500	↑
2. Industrial waste	37	50	↑
3. Biomass	4,780	5,570	↑
4. Biogas (WW + Crops)	500	1,280	—
5. Small hydro	188	376	↓
6. Wind	1,515	3,002	↓
7. Solar	3,294	6,000	↑
8. Large hydro	2,906.4	2,906.4	—
Others (Geothermal)	-		↑

Heat

Share in RE % 19.15 19.19

	July 2018	AEDP2015	AEDP2018
1. MSW	69	495	—
2. Biomass	4,229	22,100	—
3. Biogas	370	1,283	—
4. Solar	5.69	1,200	↓
5. Alternatives Heat Source*	-	10	—

* Geothermal, pyrolysis oil, etc.

Categories	AEDP2015	AEDP2018
Solar / resident	—	↑
Solar Floating (EGAT)	—	↑
IPS	—	↑

Fuel

Share in RE % 6.65 3.15

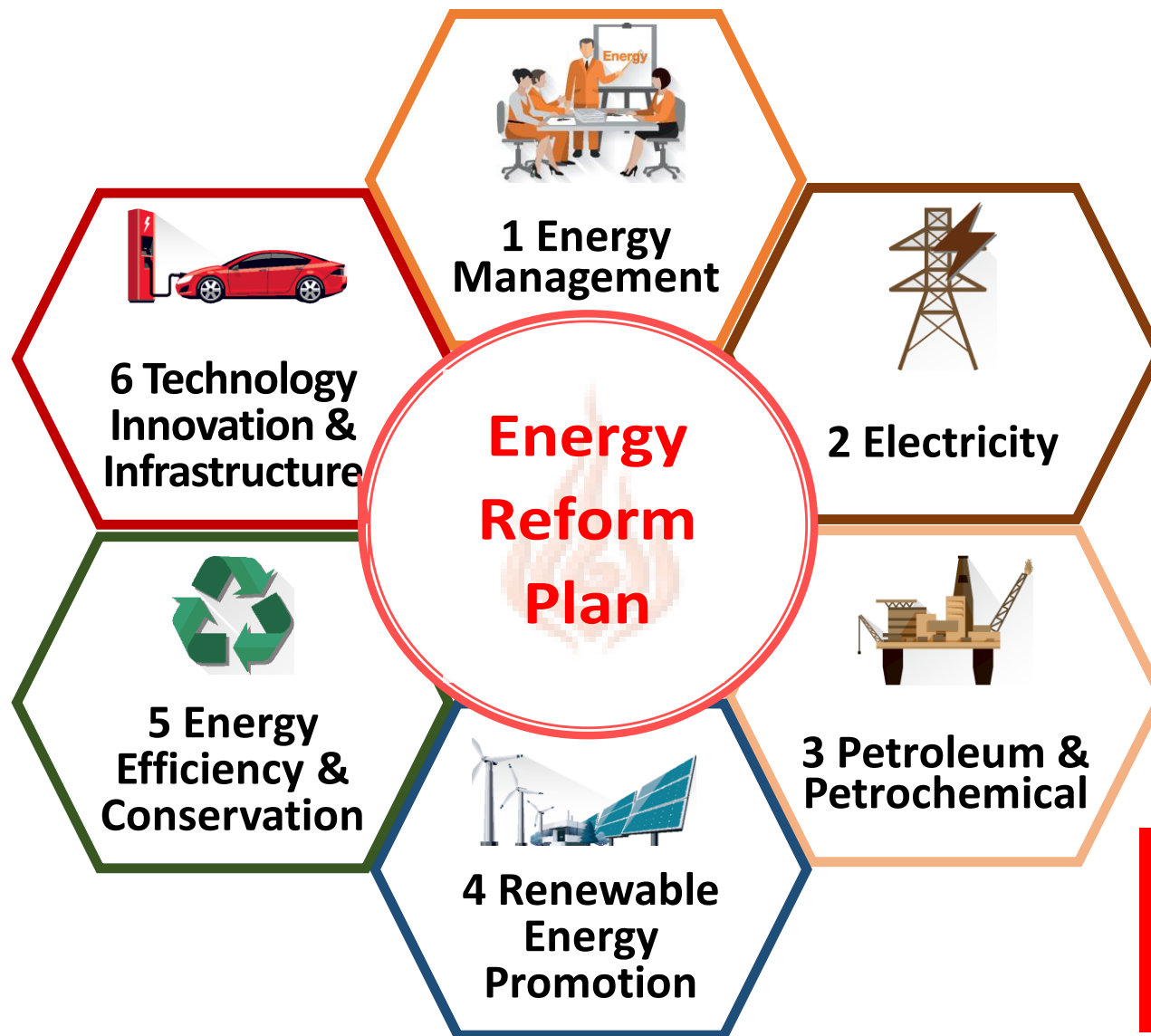
	July 2018	AEDP2015	AEDP2018
1. Biodiesel (mil l/d)	4.30	14.0	↓
2. Ethanol (mil l/d)	4.13	11.3	↓
3. Pyrolysis oil (mil l/d)	-	0.53	↓
4. CBG (ton/d)	3.0	4,800	↓
4. Alternative fuels* (ktoe)	-	10	—

* Bio-oil, Hydrogen and others

Keep overall targets of **30%** Renewable Energy in total energy consumption by 2036 but change in energy sources

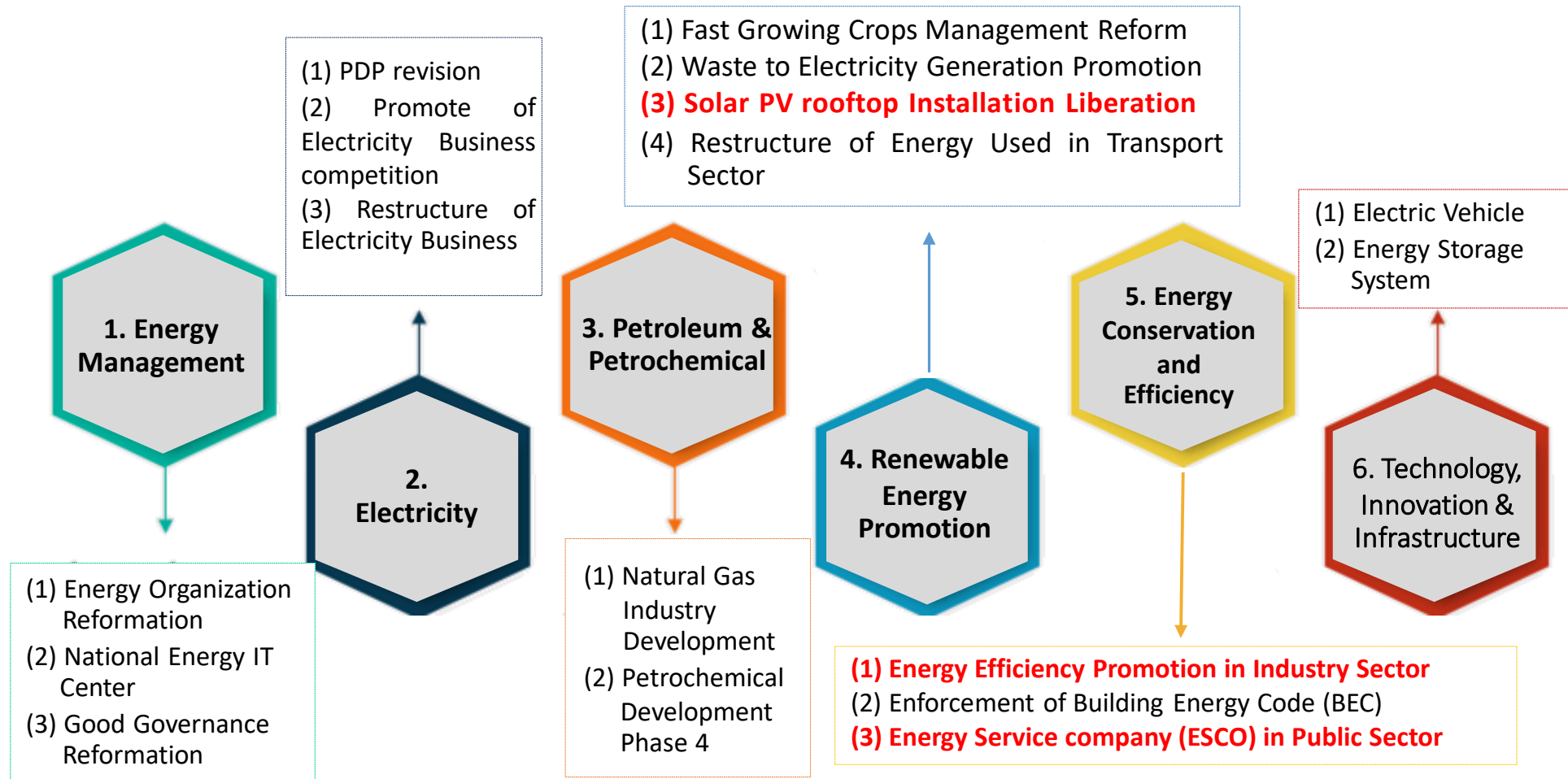
RE share 15.33 % to FEC (July 2018)

National Energy Reform



**6 Dimensions
17 keystones**

Key Points of 5 years Energy Reform (2018 – 2022) 6 Dimensions 17 keystones





Thank you for Your attention