

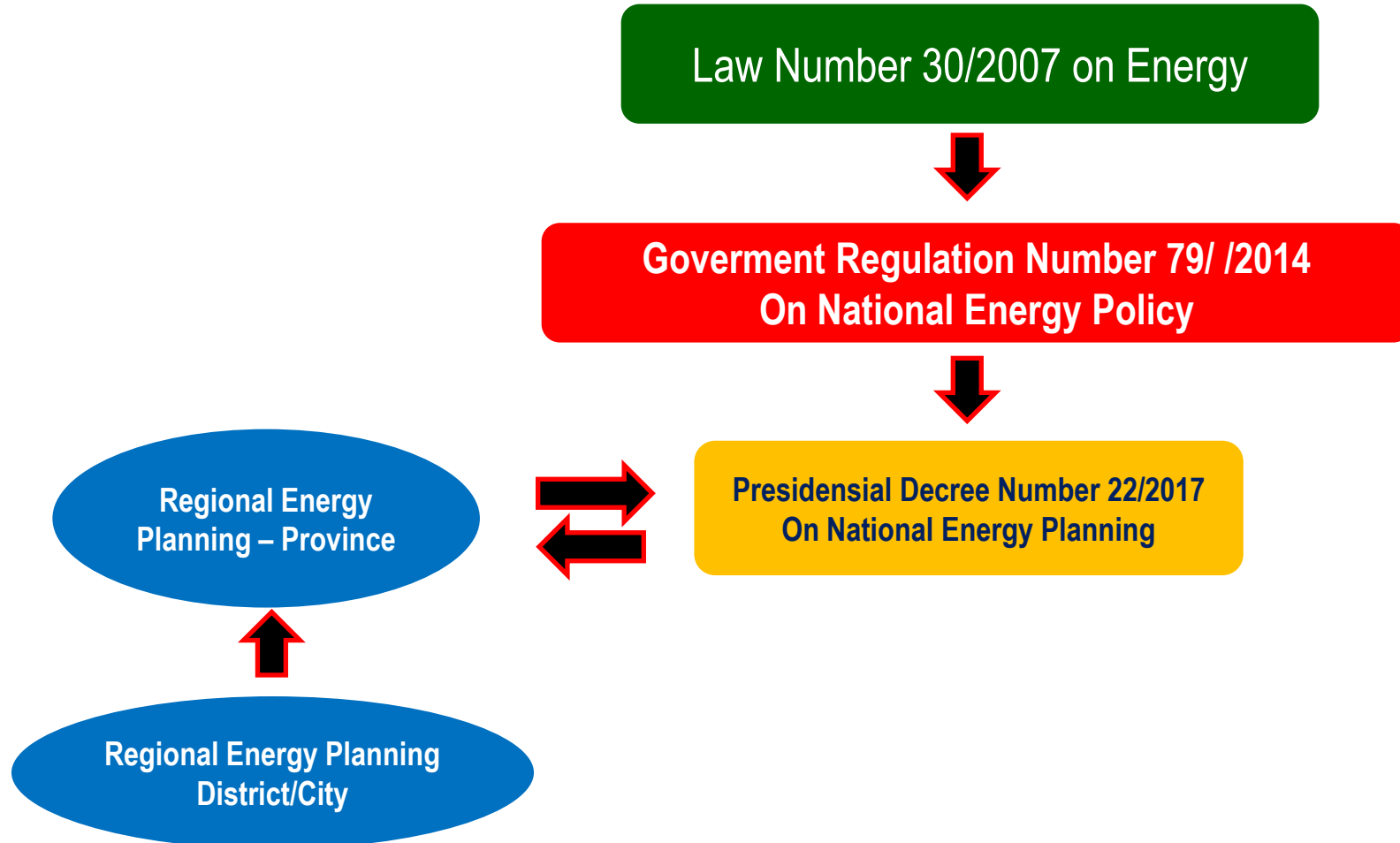


INDONESIA NATIONAL ENERGY COUNCIL

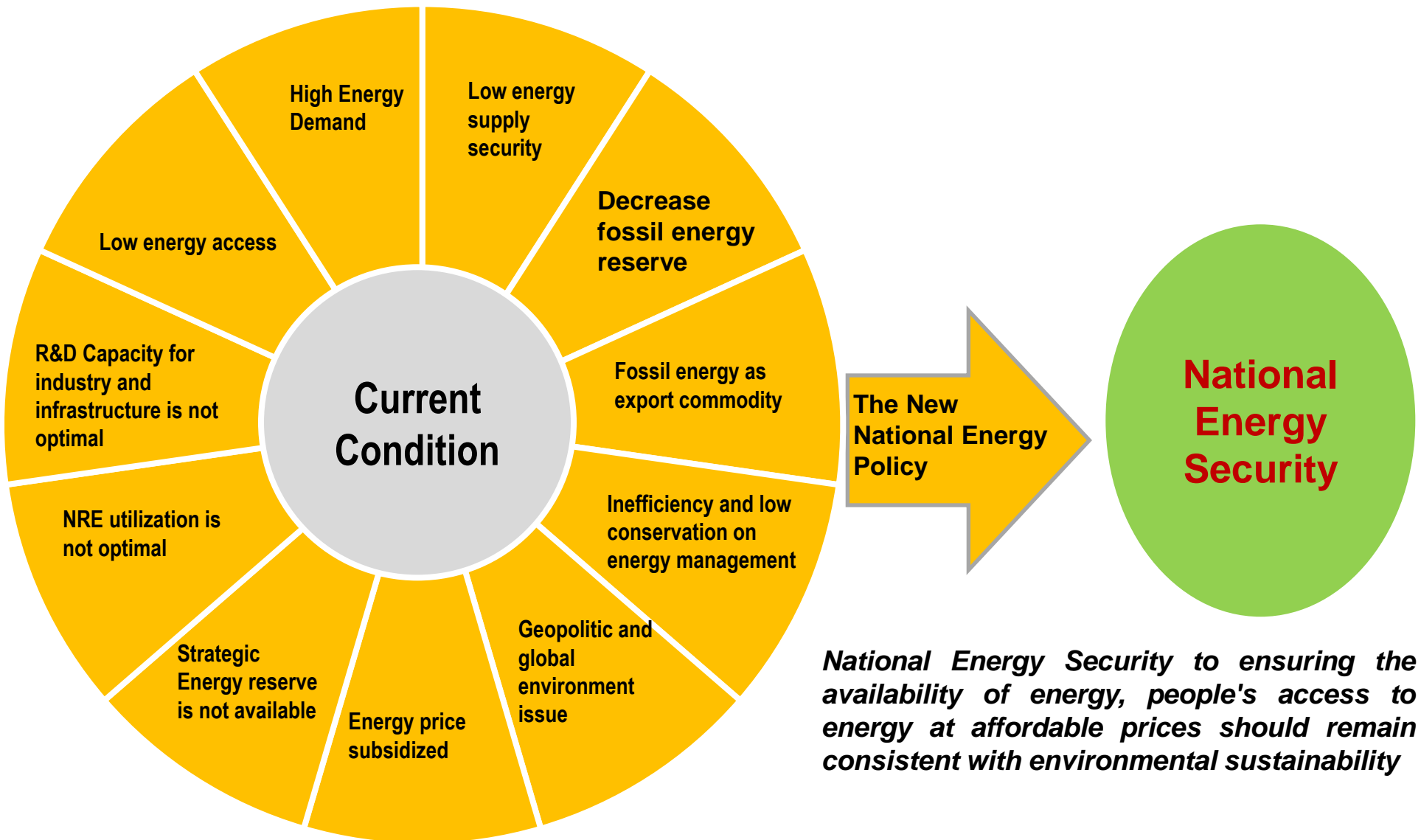
**NEW PARADIGM OF INDONESIA ENERGY
POLICY AND PLANNING**

REGULATION HIERARCHY

NATIONAL ENERGY POLICY AND PLANNING



NATIONAL ENERGY CHALLENGES



NATIONAL ENERGY POLICY

CURRENT ENERGY CONDITION

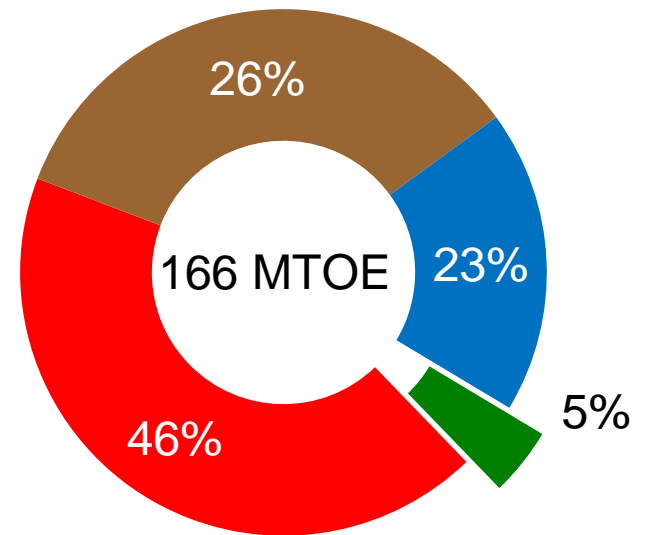
- a. High dependency on fuel.
- b. Indonesia energy mix 2015: Oil (46%); ; Batubara (26%); Gas (23%); NRE (5%).
- c. Indonesia has been a net oil importer since 2004. Production (287 MBOE); Consumption (420 MBOE); oil fuel import (195 MBOE); crude oil import (121 MBOE); refinery capacity of ± 1 million barrels per day.
- d. Energy consumption per capita is still low (5,4 BOE/cap); Consumption of electricity (865 kWh / cap); Electrification ratio (88.3%); Power generation capacity (53 GW).
- e. Energy Subsidies: ± 400 trillion IDR (2014) and ± 138 trillion IDR (2015).
- f. Energy is still used as an export commodity:
 - Gas : $\pm 42\%$ exported
 - Coal : $\pm 82\%$ exported
- g. Fuel operational reserves only for 20-25 days and there are no reserves of energy buffer.
- h. The final energy elasticity is above 1
- i. Supporting infrastructure has not been developed optimally
- j. The development of new and renewable energy is not optimal.

Government Regulation number 79 of 2014 On National Energy Policy, target of the energy mix by 2025 :

- Oil : $< 25\%$,
- Gas : $> 22\%$
- NRE : $> 23\%$
- Coal : $> 30\%$

Energy Mix 2015

- Oil
- Gas
- Coal
- NRE



Source: reprocessed from Handbook Energy Indonesia, MEMR

EXPECTED CONDITIONS

CURRENT CONDITION

- High Energy Demand
- Energy supply security has not kept up with the increase in demand
- Fossil energy reserve decreasing
- Limited access to energy : inadequate/lack of infrastructure
- Fossil energy as export commodity
- Oil imports increased
- Low energy efficiency and conservation in energy management
- NRE utilization is still not-optimal
- Energy reserves are limited

**Increasing
of National
Energy
Security**

EXPECTED CONDITIONS

- Actualizing energy security and energy independency in support of sustainable national development :
- Change of energy management paradigm; energy resources as a national capital
 - Independency on energy management;
 - Ensuring the availability of energy ;
 - Optimization energy resources management;
 - Efficient use of energy in all sector
 - Increasing public acces to energy
 - Enhancing self-reliance in technological capability and capacity in energy industry
 - Creating employment opportunity, and
 - Preserving the environment

Energy as National Development Capital

a shift of paradigm on energy

Govt. Reg. 79 of 2014
on National Energy Policy

1. Energy independence is achieved by realizing energy resources as a national capital development.
2. Optimizing energy use, for:
 - national economic development
 - creation of value added in the country
 - absorption of manpower.

~ Article 6 dan 7 Govt. Reg . 79 of 2014



Increasing the portion of gas and coal for domestic rather than export



alignment fiscal target's with the energy policy



economic multiplier effect

comodity	2014	2019	export 0%
Gas	57%	64%	2035
Coal	20%	60%	2046

- Fuel exercise
- depletion premium
- fiscal incentives
- national budget

Ministry of Finance and Ministry of National Development Planning

enhancement:

- economic growth
- Industrial growth
- absorption of manpower

NATIONAL ENERGY POLICY TARGET

(Article 9, Government Regulation 79/2014 on National Energy Policy)

01 NEW PARADIGM

Establishment of a new paradigm of energy sources as capital of the national development

02 ENERGY ELASTISITY

Energy elasticity achievement shall be less than 1 (one) in 2025 that comply with the economic growth

03 ENERGY INTENSITY

Reduction in final energy intensity of 1% (one percent) per year up to 2025

04 ELECTRIFICATION RASIO

Achievement of Electrification Ratio of 85% (eighty five percent) in 2015 and close on 100% (one hundred percent) in 2020

05 HOUSEHOLD GAS UTILIZATION RASIO

Achievement of the household gas utilization ratio of 85% (eighty five percent) in 2025

06 ENERGY MIX

Achievement of optimal primary energy mix

NATIONAL ENERGY POLICY DIRECTION

(Article 3, Government Regulation 79/2014 on National Energy Policy)

The Main Policies

Availability of Energy to meet the national demand

Priority of energy development

Utilization of national energy resources

National energy reserves

The Supporting Policies

Energy conservation, Conservation of energy resources and diversification of energy

Environment safety

Pricing, subsidy, and energy incentives

Infrastructure and access to energy and energy industry for the public

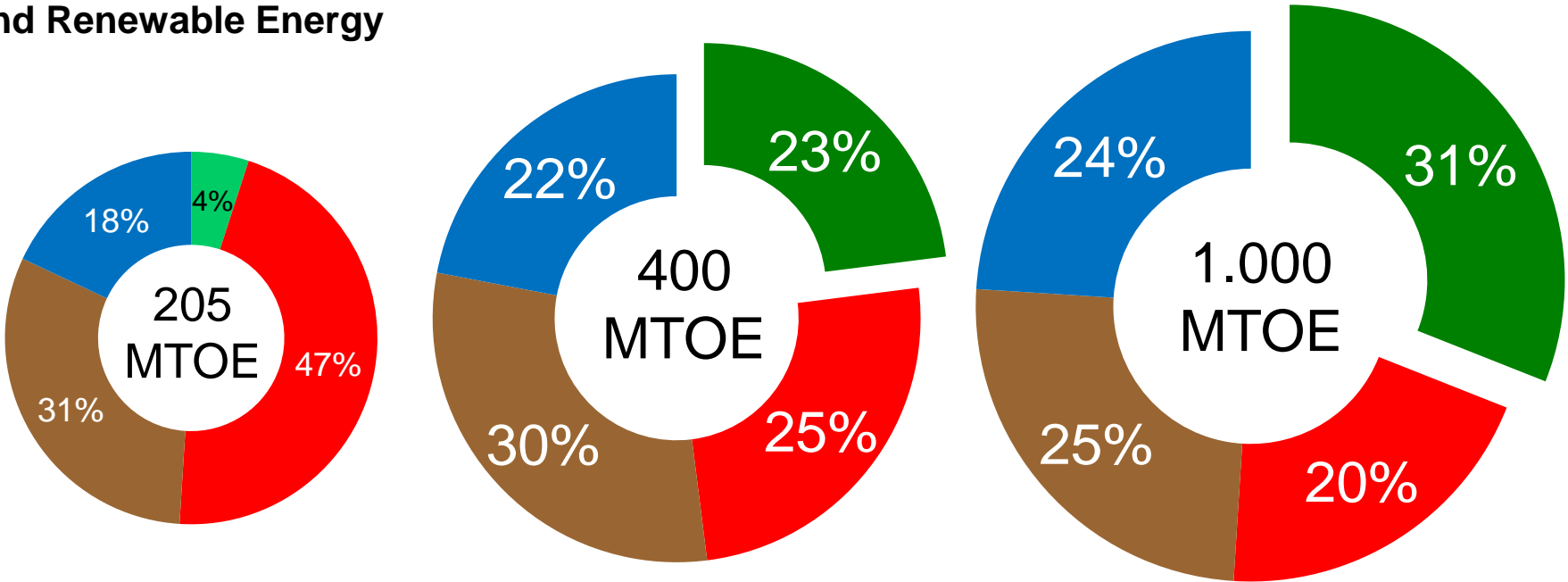
Research, development, and application of energy technology

Institutional and funding matters

NATIONAL ENERGY MIX to 2050

(Article 8 & 9, Government Regulation 79/2014 on National Energy Policy)

- New and Renewable Energy
- Oil
- Gas
- Coal



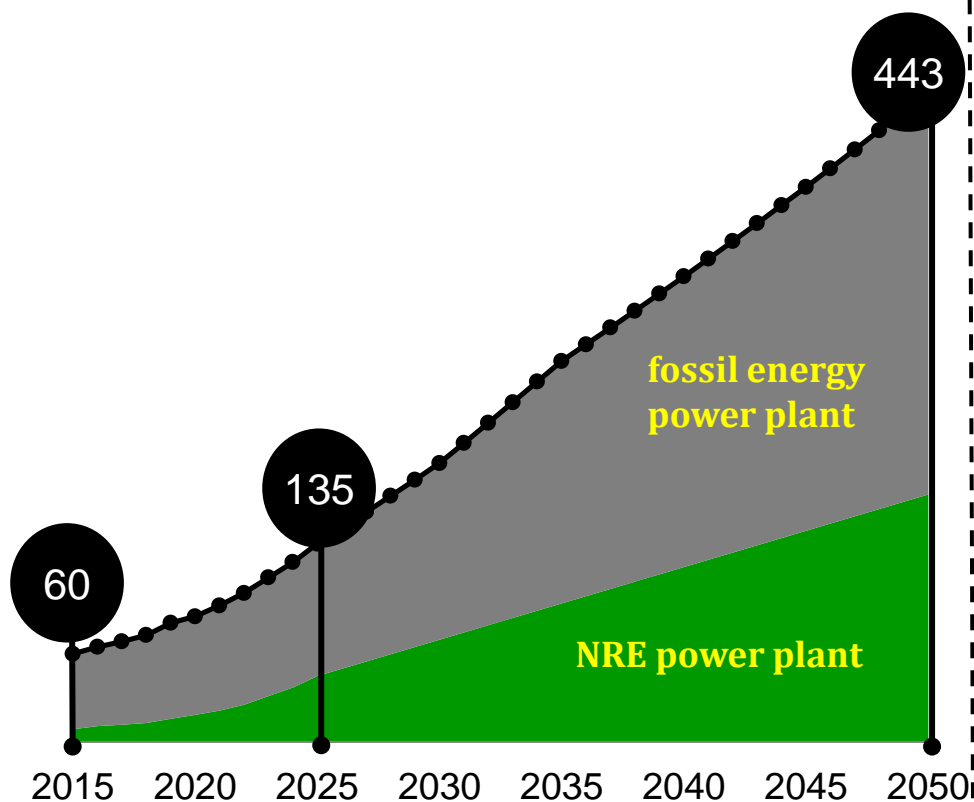
	Saat ini	2025	2050
PP Capacity	55 GW	115 GW	430 GW
Energy Consumption	0,8 TOE/cap	1,4 TOE/cap	3,2 TOE/cap
Electricity Consumption	787 KWh/cap	2.500 KWh/cap	7.000 KWh/cap

NATIONAL ENERGY PLANNING

Development of Power Plants

PLAN

ACTION



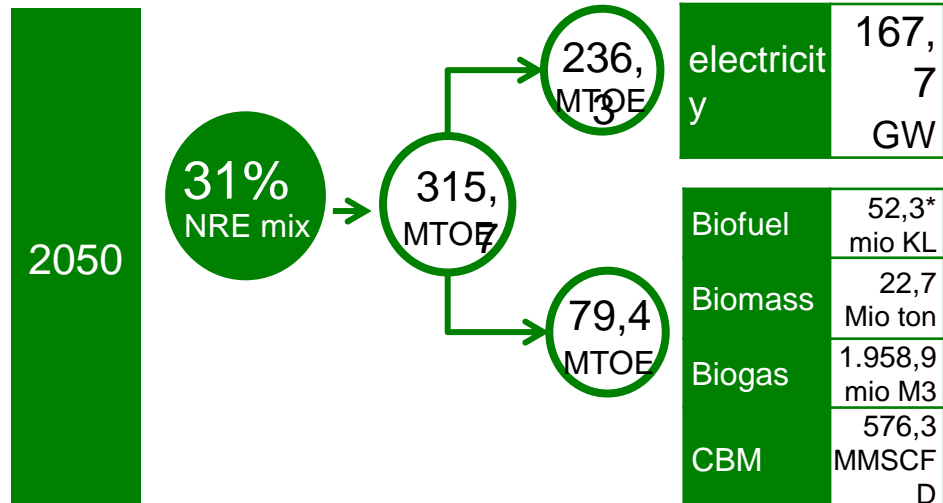
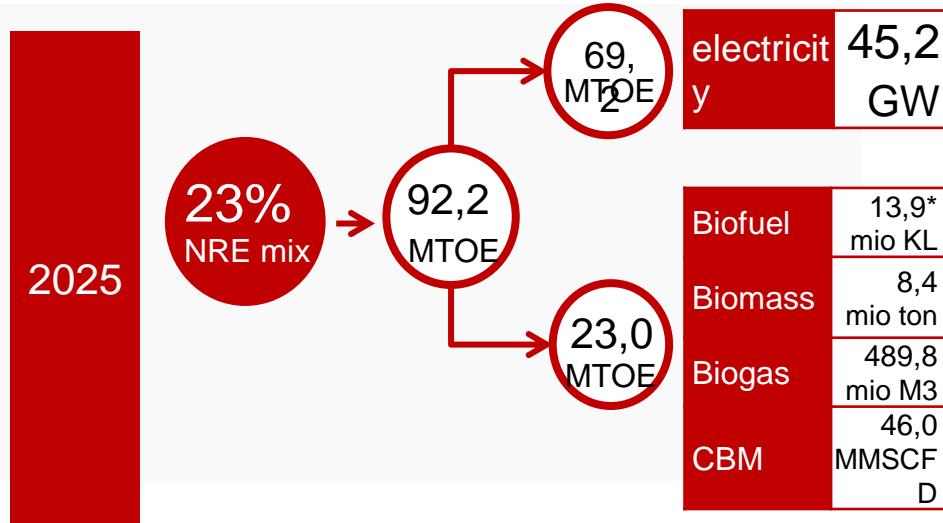
TYPE	2015	2020	2025	2030	2040	2050
NRE	8.6	16.2	45.2	69.7	118.6	167.6
	14.3%	19.4%	33.3%	36.6%	37.4%	37.8%
FOSSIL	51.5	67.3	90.4	120.6	198.6	275.4
	85.7%	80.6%	66.7%	63.4%	62.6%	62.2%
Total	60.1	83.4	135.5	190.2	317.2	443.1

1. increasing the electrification ratio by nearly 100% in 2020 (Ministry of Energy and Mineral Resources/MEMR)
2. power plant capacity development:
 - 135,4 GW in 2025: 90.4 GW of fossil energy power plants and 45 GW of NRE power plants
 - 444,5 GW in 2050: 275,4 GW of fossil energy power plants and 169 GW of NRE power plants (MEMR)
3. formulating of land use mechanism for energy supply on overlaps land use. (Ministry of Land and Spatial Planning/ MLSP)
4. formulating of regionalization electricity business. (Ministry of State-Owned Enterprises/ MSOE)
5. applying the progressive electricity tariffs. (MEMR)
6. ensuring strategic energy infrastructure projects. (Ministry of Finance)
7. developing a prototype of steam power plant ≤ 200 MW using 100% local content, until ready for commercial (Ministry of Research, Technology and Higher Education/MRTHE)
8. mastering of technology nuclear power plant. (MRTHE)
9. strengthening the implementation and utilization of technology and power plant technology components. (MRTHE)
10. Encouraging the establishment of the Engineering Procurement Construction (EPC) for electricity projects with a capacity ≤ 200 MW. (Ministry of Industry/Mol)
11. Facilitating the process of licensing services for the utilization of forest areas (including: leasing, cooperation, utilization of environmental services, or the release of forest area) for energy sector activities. (Ministry of Environment and Forestry/ MEF)
12. formulating policies that prioritize the use of the national production of equipment and services including energy industry. (Mol)

New and Renewable Energy Targets

PLAN

ACTION



1. Build NRE power plants:

Types of Power Plant (MW)	2025	2050
Geothermal	7.239	17.546
Hydro & Micro hydro	20.960	45.379
Bioenergy	5.532	26.123
Solar	6.379	45.000
Wind	1.807	28.607
Other NRE	3.128	6.383

(MEMR)

2. Establishing a specialized business entity for NRE. (MSOE)

3. Allocating subsidies feed-in tariff of renewable energy plants. (MEMR)

4. Providing an area of 4 million hectares gradually to fulfill the needs of biofuel raw materials to produce 16.4 million kiloliters of biofuel.(MLSP)

5. Developing a roadmap of priority plant species and prepare a biofuel feedstock crop seeds while maintaining food security. (Ministry of Agriculture)

6. fulfilling biofuel production target of at least 15.6 million kl in 2025 and 54.2 million kl in 2050. (MEMR)

7. Developing roadmap biogas development and fulfill the production target of 47.4 MMSCFD in 2025. (MEMR)

8. Assignment of State Owned Enterprises / Public Service Agency to develop geothermal power plants. (MEMR)

9. Assignment of specific State Owned Enterprises to produce and purchase biofuels. (MEMR)

10. Strengthening research and development and application of energy industry systems and components primarily for the use of NRE (MRTHE)

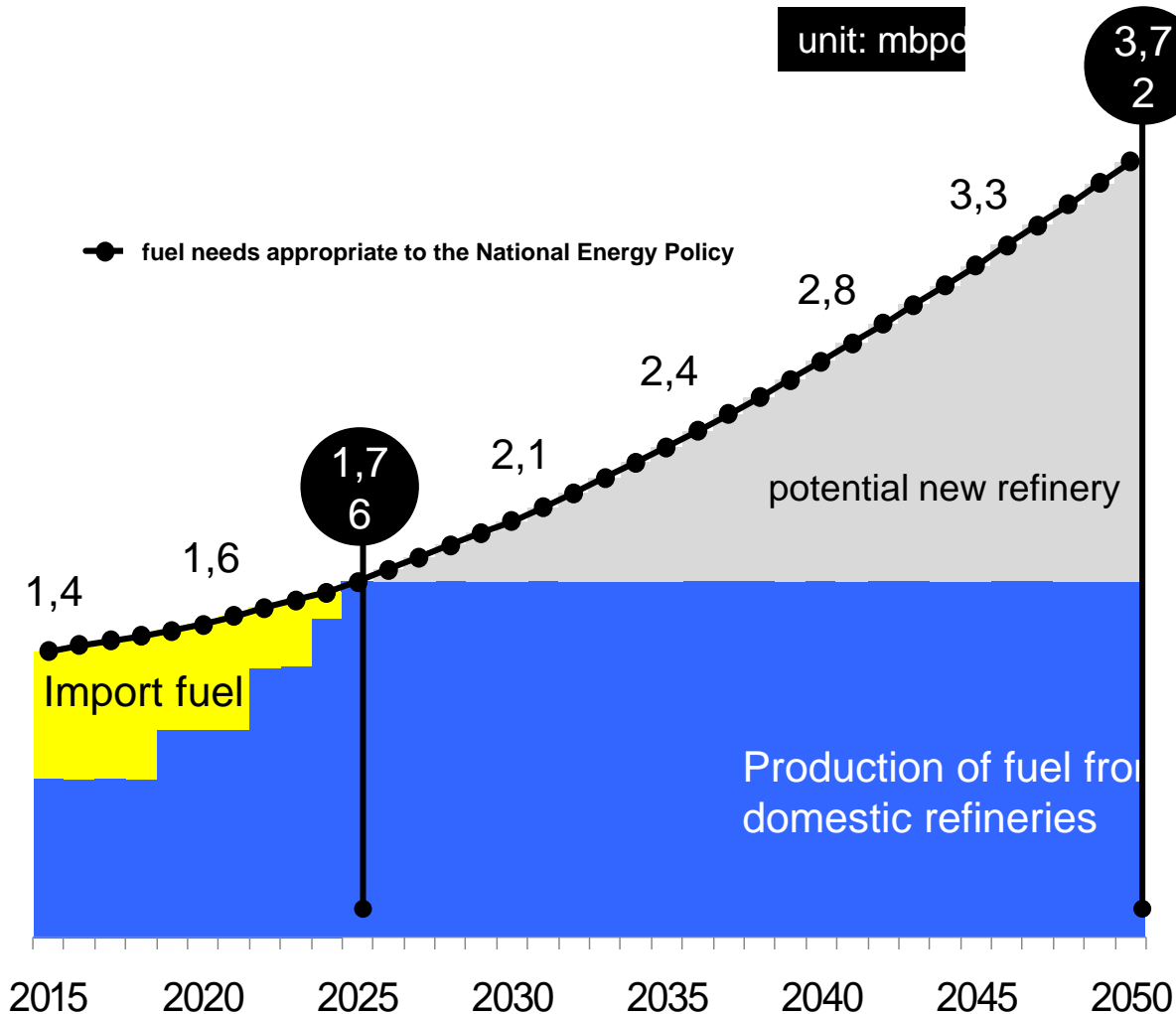
11. Facilitation of the location of geothermal and water energy resources in the area of conservation forest and protected forest (MEF)

12. Developing guidelines to encourage potential energy subsidies from local government (Ministry of Home Affairs/ MoHA)

Developing of Oil Refinery and Oil Supply

PLAN

ACTION



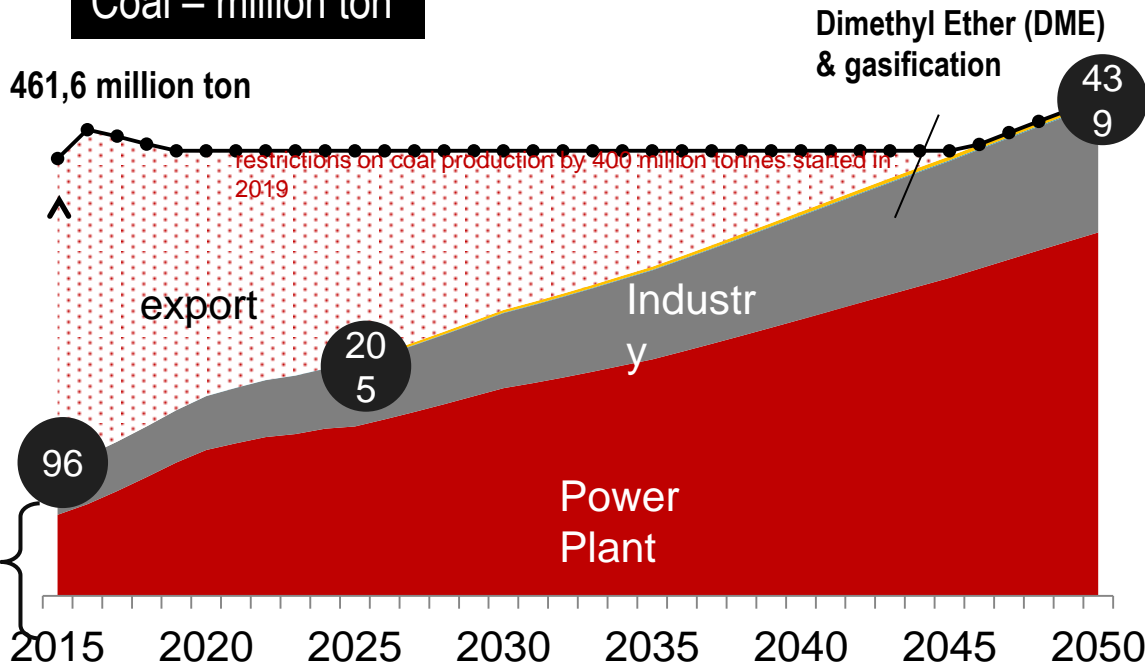
1. Increasing the capacity of the national oil refinery to more than 2 million barrels per day in 2025, through the construction of new refineries and Refinery Development Master Plan (RDMP). (MEMR)
2. Setting the type and volume of operational reserves for the purposes of a minimum of 30 days of consumption. (MEMR and MSOE)
3. Establishing the type, quantity, time, location, and management of buffer stocks of energy (CPE) and draw up a master plan / roadmap CPE management. (National Energy Council)
4. Providing fiscal and non fiscal incentives for energy sales in the country, especially in industrial activity. (MoF)
5. Improving the quality of public services the local governments who support the acceleration of the issuance / simplification of license and energy infrastructure development in the area. (MoHA c.q. Local Government)
6. Increasing Reserve Replacement Ratio up to 100% in 2025. (MEMR)

Coal as the Reliable national Energy Supply

PLAN

ACTION

Coal – million ton



Program	2015	2016	2017	2018	2019	2020	2025	2030	2040	2050
Export	365,8	288,1	274,8	251,6	232,9	220,4	194,8	147,3	59,9	0
Domestic										
PP	63,2	82,4	94,2	106,8	120,0	131,1	152,3	186,7	248,5	326,6
Industry	15,8	43,5	44,5	45,6	47,0	48,4	55,2	67,4	92,9	114,8
DME	-	-	-	-	-	-	2,1	2,5	3,2	4,0
Gasification	0,0	0,0	0,0	0,0	0,1	0,2	0,4	0,5	0,7	0,9
Total Production	461,6	414,0	413,0	403,0	400,0	400,0	400,0	400,0	400,0	438,7

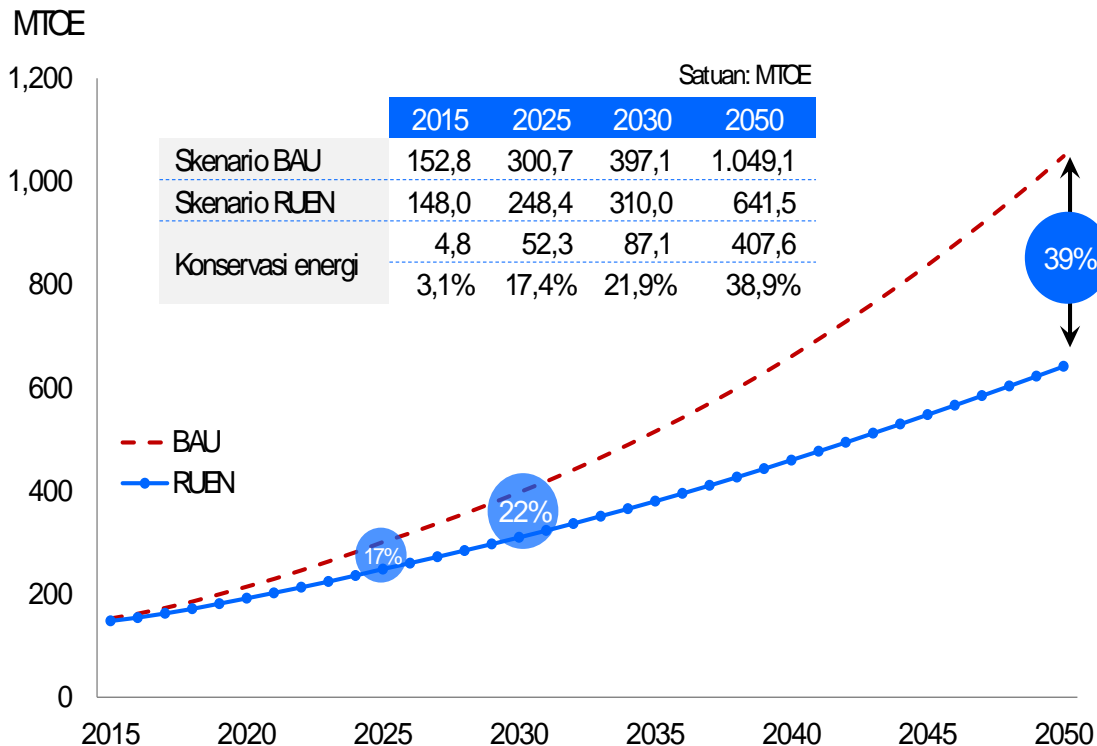
1. Controlling the maximum coal production of 400 million tons starting in 2019 with the priority of domestic needs and stop exports in the domestic demand of 400 million tonnes. (MEMR)
2. Reducing the share of coal exports gradually and stop coal exports by the year 2046. (MEMR)
3. Developing coal gasification industry. (Mol)
4. Increasing the capacity of basic chemical industry based on oil and gas and coal to increase value-added and import substitution. (Mol)
5. Formulating a master plan for port development plan integrated coal. (Ministry of Transportation/ MoT)
6. Improving the utilization of coal to the industrial sector with a target of 55.2 million tonnes in 2025. (Mol)

Energy Efficiency and Conservation

PLAN

ACTION

Comparison of economic growth on energy consumption



1. Restructuring the industry machinery, publishing green industry standard and giving incentives for industrial facilities that implement energy efficiency. (MoI)
2. Accelerating the development of mass transport and increased use of gas and electricity. (MoT)
3. Rejuvenating public transport to improve the efficiency of energy use. (MoT)
4. Implementing Minimum Energy Performance Standard (MEPS) dan labeling on energy utilizing equipment. (MEMR)
5. Developing Energy Service Company (ESCO) policy for the implementation of energy efficiency projects. (MEMR)
6. Accelerating the substitution of fuel with the gas transport sector and the development of electric trains. (MoT)

Note:

APAEC : Asean Plan of Action for Energy Cooperation

EE&C : Energy Efficiency and Conservation

National Energy - Energy elasticity less than 1 (one) in 2025

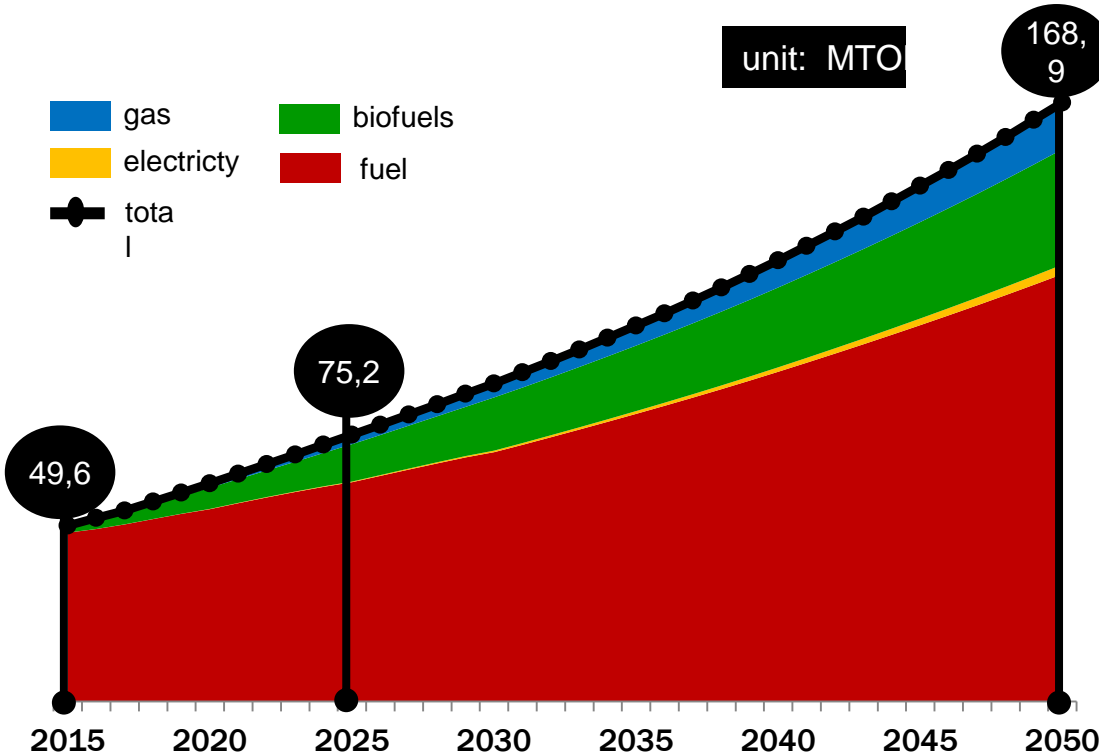
Policy targets : - Reduction in final energy intensity of 1% (one) percent per year up to 2025

Transportation Sector

PLAN

ACTION

unit: MTO



Energi		2015	2020	2025	2030	2040	2050
Listrik	TWh	0,2	0,9	2,3	5,2	14,9	31,6
Gas fuel	MMSCFD	19,1	130,9	288,7	429,8	832,7	1.435,0
Fuel	Mio KL	56,9	65,1	74,2	84,1	111,4	144,9
Biofuel	Mio KL	2,0	6,7	12,0	17,3	26,1	38,1

1. Accelerate the implementation of substitution of fuel with the gas transportation sector with the construction of 632 gas fuel stations in 15 cities until 2025. (MoT)
2. Gradually develop 2,200 units of 4-wheel electric-powered vehicles and 2.1 million electric-powered 2-wheel vehicles in 2025. (MoT)
3. Increased use of biofuels. (MEMR)

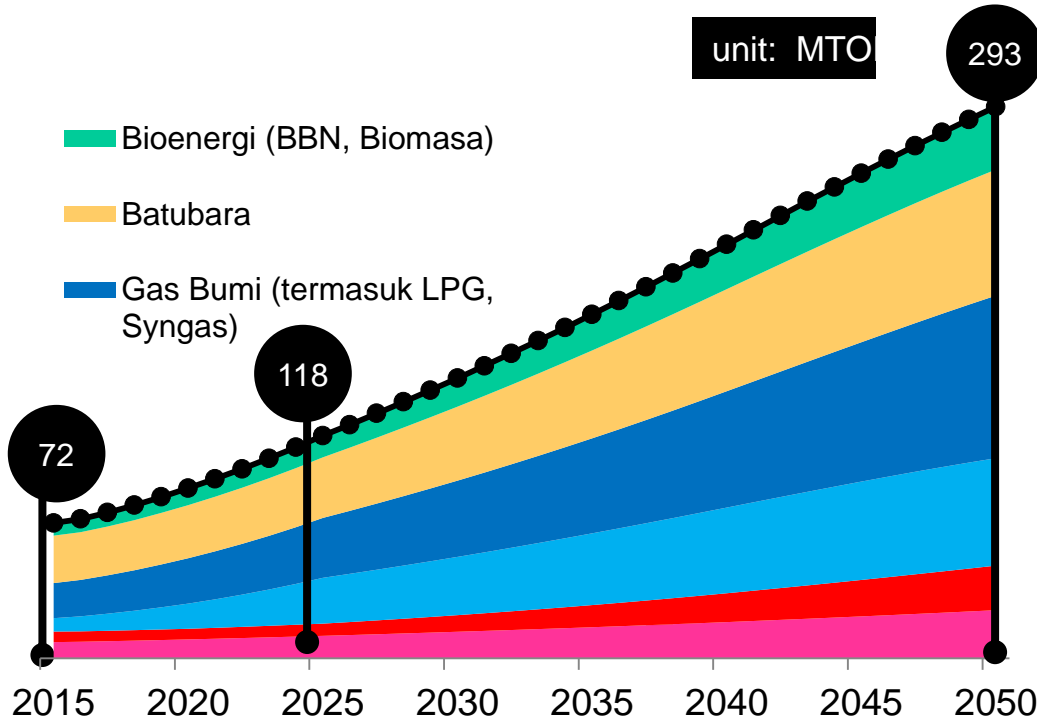
Jenis Biofuel		2016	2025	2050
Biodiesel	blended	20%	30%	30%
	mio KL	2,9	8,7	20,4
Bioethanol	blended	5%	20%	20%
	mio KL	0,1	3,3	14,1
Bioavtur	blended	2%	5%	5%
	mio KL	0,0	0,1	3,6

4. Developing Railway, MRT, LRT, Tram in 13 urban areas and train service in Java and Sumatra island. (MoT)
5. Share targeted transport by 30% in 2025 with the development of urban mass transportation system of the airport railway. (MoT)
6. Develop transportation management by formulating Intelligent Transport System in 50 cities and Area Traffic Control System at 70 locations. (MoT)

Industry Sectors - Energy and Raw Materials

PLAN

ACTION



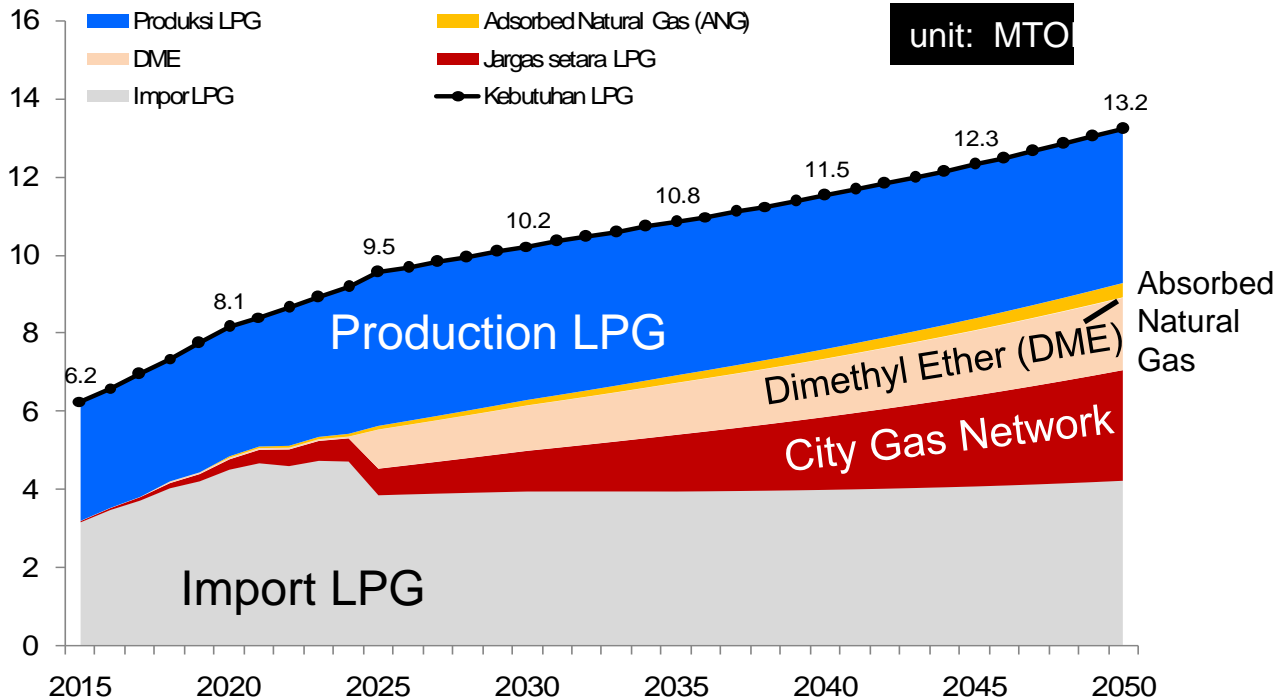
Type		2015	2020	2025	2030	2040	2050
Electricity	TWh	83,5	157,1	286,1	363,8	535,0	670,5
Gas & Syngas	MMscfd	2.014,0	2.605,1	3.441,8	4.384,4	6.701,3	9.374,8
Fuel	mio KL	6,2	6,2	7,2	9,8	17,0	26,3
LPG	Mio Ton	0,1	0,1	0,1	0,1	0,1	0,1
Coal	Mio Ton	43,2	48,4	55,2	67,4	92,9	114,8
Biofuel	Mio KL	0,3	1,5	2,3	3,6	6,9	11,0
Biomass	mio Ton	9,3	11,1	13,6	17,2	25,5	34,0
Non fuel	mio KL	63,1	73,7	87,4	103,1	140,5	186,5

1. Prioritizing the use of fossil energy sources and fossil energy resources as a national industrial raw materials. (MEMR)
2. Providing fiscal and non fiscal incentives and competitive energy prices for industry. (MoF dan MEMR)
3. Increasing the share of non-oil investment in processing industries outside Java island to 40%: 60% in 2035. (Mol)
4. Increasing the capacity of basic chemical industry based on oil and gas and coal to increase value-added and import substitution. (Mol)
5. Establishing priority of industry location with high energy needs closer to energy resources. (Mol)
6. Gradually applying energy management system in industry. (Mol)
7. Building a coal gasification industry. (Mol)

Increase Gas Network and DME - Household

PLAN

ACTION



Activity	2015	2016	2017	2018	2019	2020	2025	2030	2040	2050
LPG Production	3,1	3,1	3,2	3,2	3,3	3,3	3,9	3,9	3,9	3,9
DME	0,0	0,0	0,0	0,0	0,0	0,0	1,0	1,2	1,5	1,9
Gas network equal to LPG	0,0	0,0	0,1	0,1	0,2	0,3	0,7	1,0	1,9	2,8
Absorbed Natural Gas (ANG)	0,0	0,0	0,0	0,0	0,0	0,03	0,09	0,1	0,2	0,4
LPG Import	3,1	3,5	3,7	4,0	4,2	4,5	3,8	3,9	4,0	4,2
	50%	53%	53%	55%	55%	55%	40%	38%	35%	32%
Total demand LPG	6,2	6,6	6,9	7,3	7,7	8,1	9,5	10,2	11,5	13,2

Reduce imports of LPG in the long term, with the following activities :

1. Massive construction of gas network amounted to 4.7 million households in 2025. (MEMR and Local Government)
2. Dimethyl Ether as a mixture of LPG amounted to 1 million tonnes in 2025 (MEMR)
3. Absorbed Natural Gas amounted to 0,1 million tonnes in 2025 (MEMR)

NUCLEAR POWER DEVELOPMENT

PLAN

ACTION

“Formulating the implementation roadmap of a nuclear power as a *last choice* in the priority of national energy development.”

2016 -
2050

nuclear as the last choice in the National Energy Policy, translated in RUEN as the following steps:

- Develop roadmap implementation of nuclear power as a last choice in the national energy development priorities;
- Multi-criteria analysis of the implementation of the NPP;
- Pre-feasibility study NPP;
- Build a power reactor as a laboratory research;
- Encourage international cooperation to enhance technology capability.

thank you

Tabel Konversi

Konversi :			
1 MTOE	=	39,72296	bcf
	=	108,83003	MMscfd
1 MTOE	=	7,2003715	MBOE
	=	0,019727	MBOPD
	=	1,1448591	Juta KL
1 MTOE	=	11,74612	TWh
1 MWh	=	0,613	BOE
1 BOE	=	0,1716	KL (Mitan)
1 Ton	=	4,2	BOE
1 BOE	=	0,1173	Ton (LPG)
1 cf	=	0,0283168	m3
1 BOE	=	0,1542	KL (ADO/Solar)
1 Ton	=	4,2	BOE
1 BOE	=	0,1716	KL (Premium)
1 BOE	=	0,1437	KL (FO/Bakar)
1 BOE	=	0,1513	KL (IDO/Diesel)
1 BOE	=	0,1801	KL (Avtur)
1 BOE	=	0,1698	KL (Avgas)