



NRE of REPUBLIC INDONESIA

EAST AND SOUTHEAST ASIA RENEWABLE
ENERGY STATISTICS TRAINING WORKSHOP



Center for Data and Information Technology
Ministry of Energy and Mineral Resources (MEMR)

BANGKOK, DEC 2016

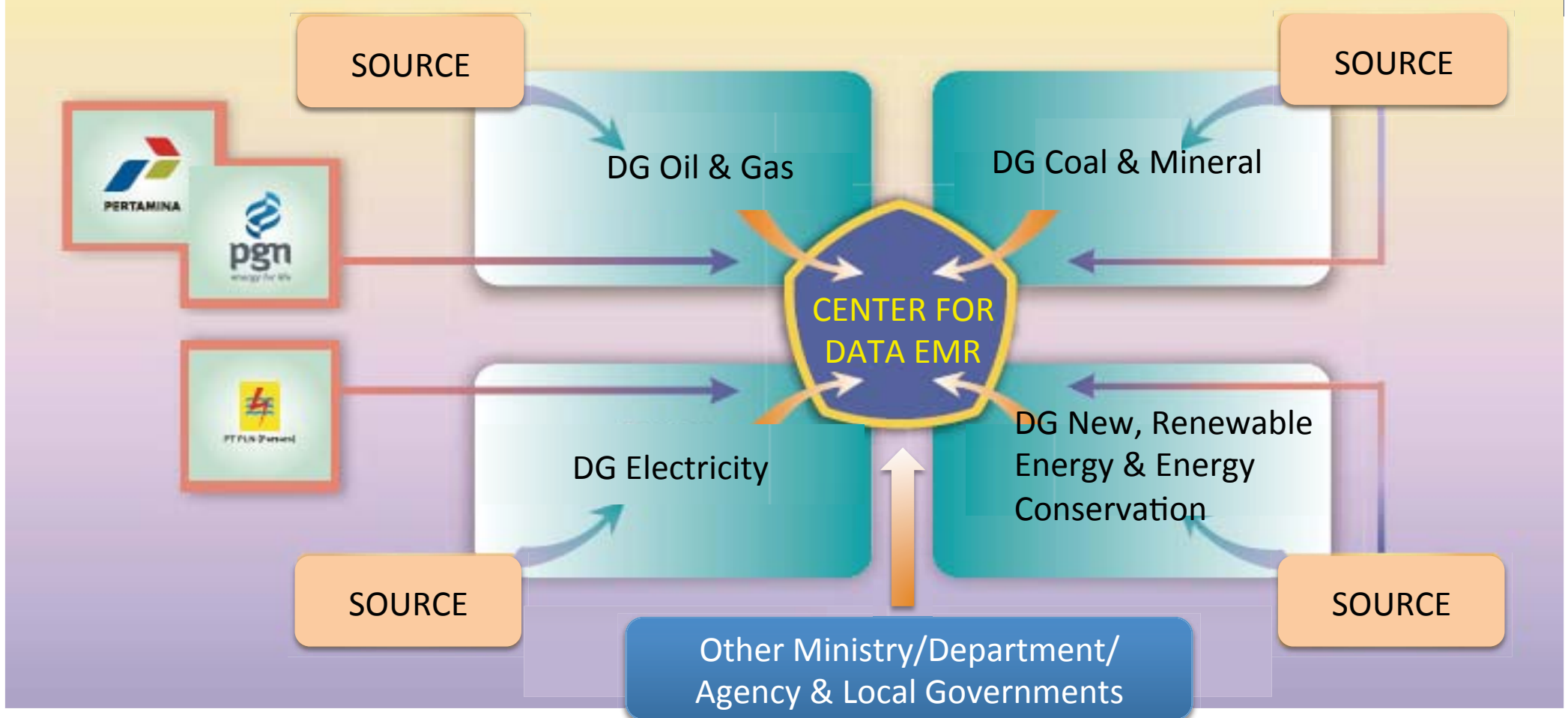


OUTLINE

- Energy data collection
- Energy data situation
- Challenges with data collection
- Recommendations



ENERGY DATA COLLECTION

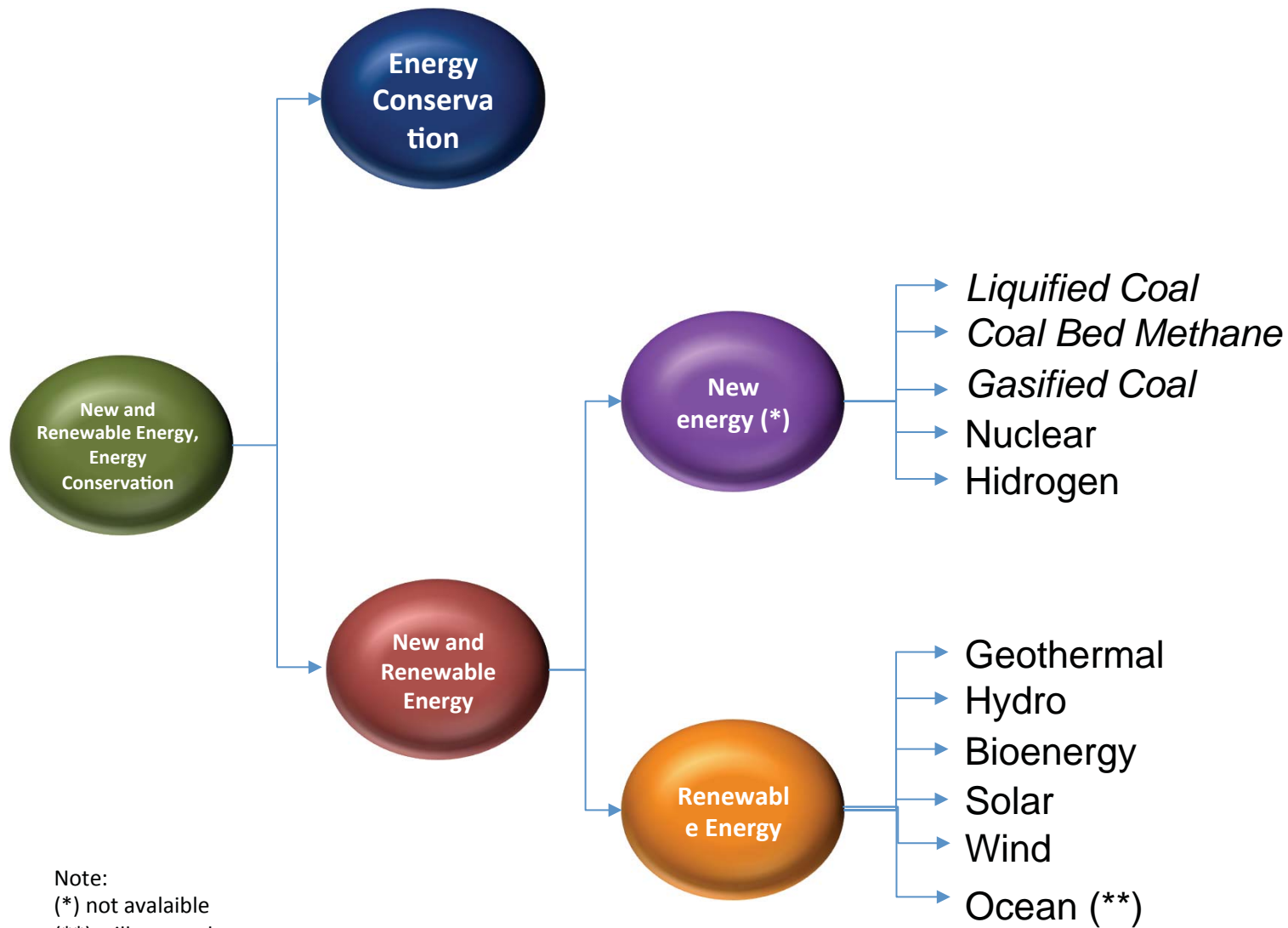


Note:

- Directorate General of New Renewable Energy and Energy Conservation : Collecting data for Geothermal, Micro hydro, Bioenergy, Solar, Wind (on/off gridd power plant (related capacity)), Energy Conservation.
- Directorate General of Oil and Gas/Oil Company : Collecting data for biofuel (alreary blended)
- Directorate General of Electricity : Collection data for Micro hydro, Bioenergy (related on gridd power plant (related electricity production))
- BPS (National Statistics Agency) :Collecting data for Biomass consumption by HH and Industry sector



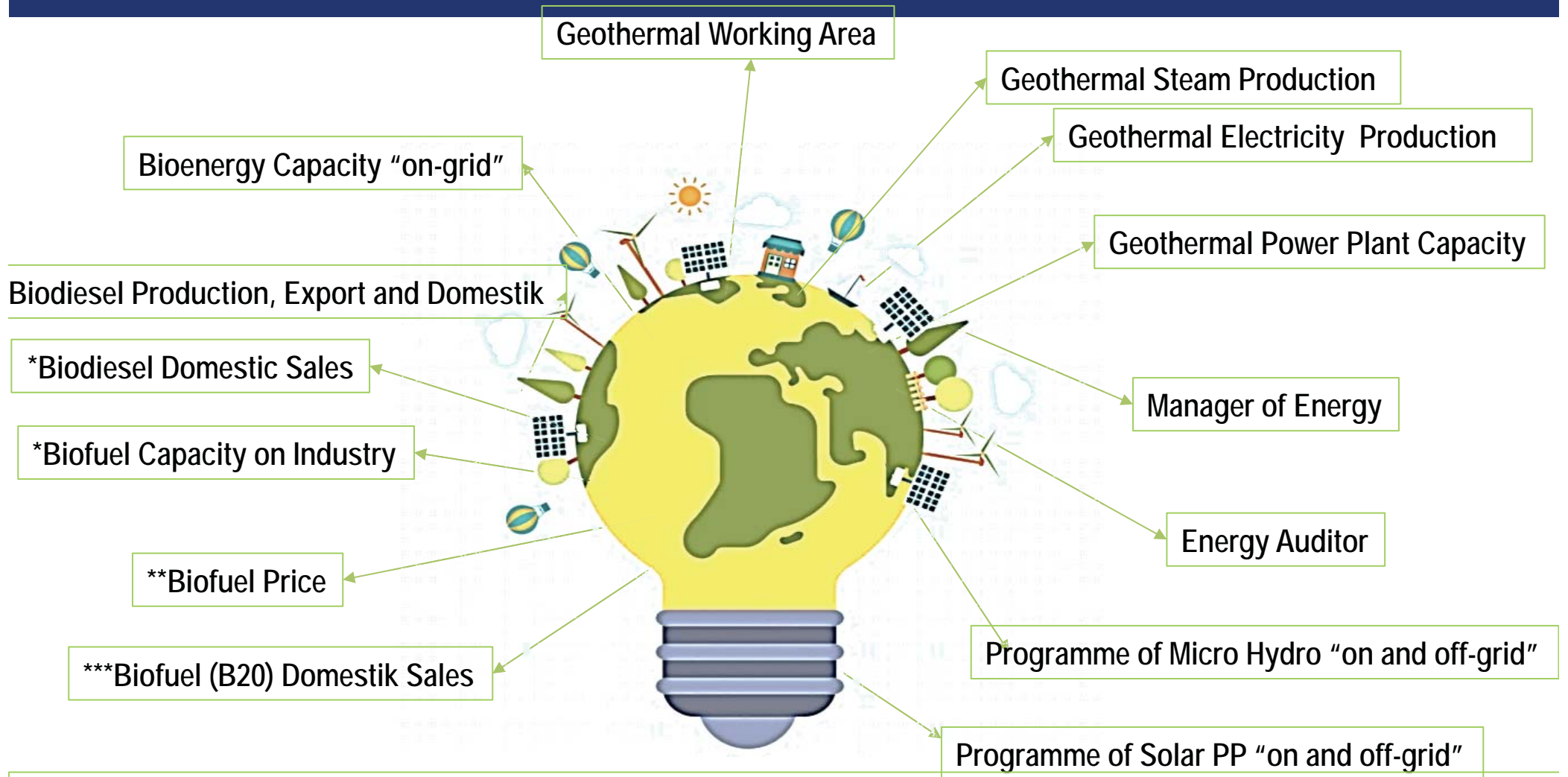
CLUSTERING NEW AND RENEWABLE ENERGY, ENERGY CONSERVATION



Note:
(*) not available
(**) still research



SCOPE DATA OF RE



Note :

* Definision of Biodiesel is fame

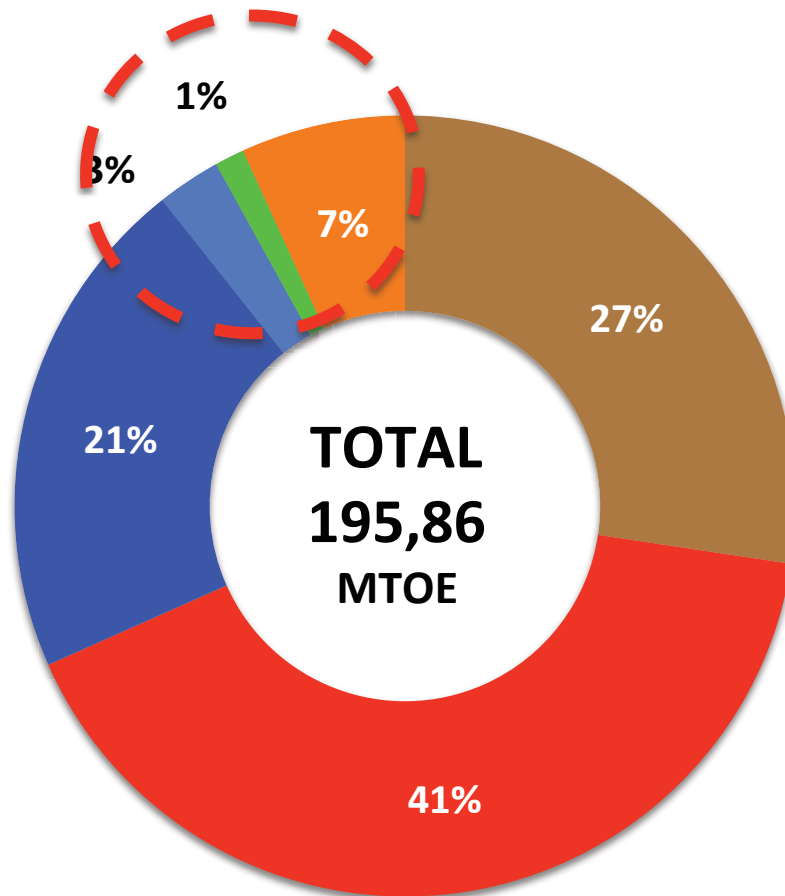
** Biofuel consist biodiesel and biethanol (fame), but bioethanol cannot move because the price not economies, no incentives/ subsidies, methanol price still high in domestic because competitive with food sector so still depend import

*** Biofuel (blended with diesel)

ENERGY DATA SITUATION

PRIMARY ENERGY SUPPLY 2015

RE = 11%



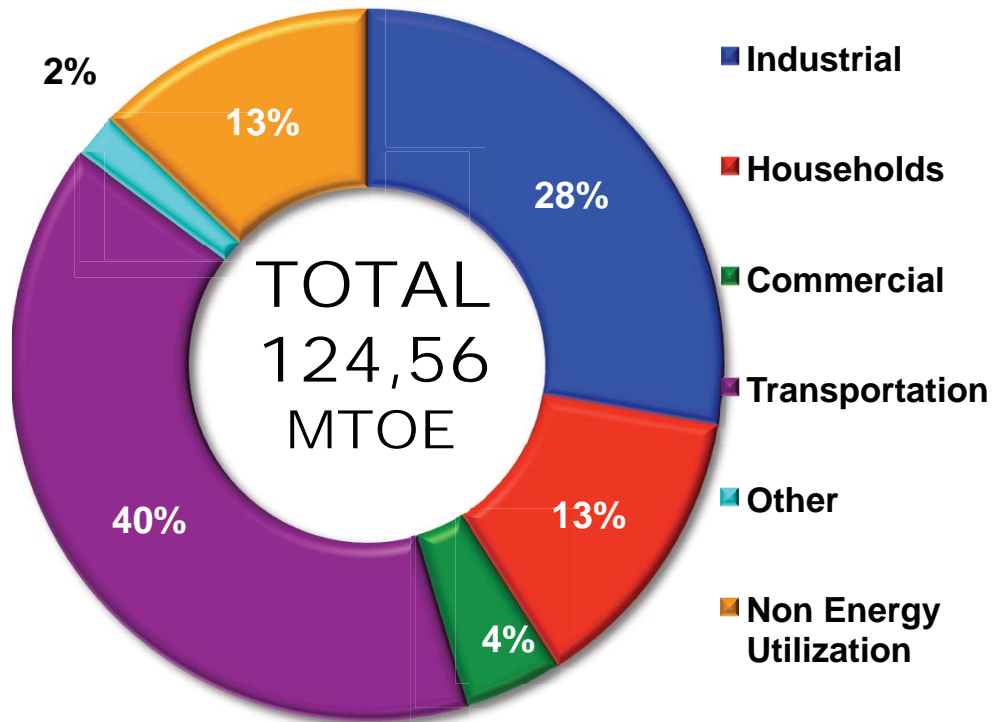
- Coal
- Crude Oil & Product *)
- Natural Gas & Product
- Hydro Power
- Geothermal
- Biofuel

*Exclude traditional biomass

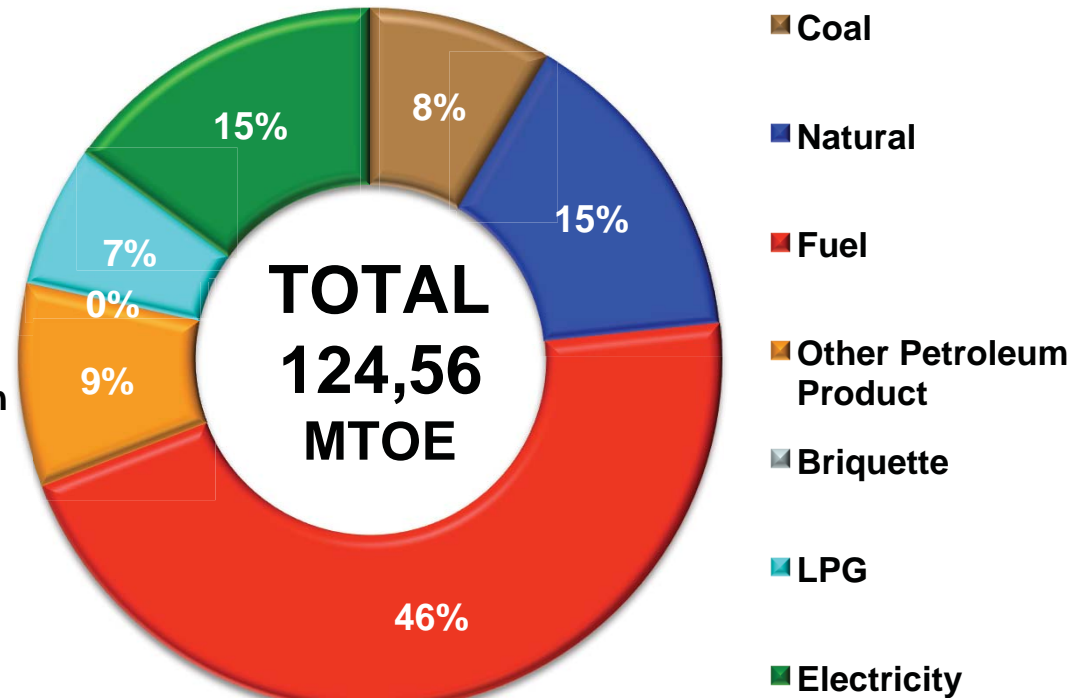


ENERGY DATA SITUATION

FINAL ENERGY CONSUMPTION BY SECTOR



FINAL ENERGY CONSUMPTION BY TYPE



*Exclude traditional biomass



INDONESIA ENERGY BALANCE 2015

Kilo TOE

	Hydro Power	Geothermal	Coal	Briquette	Natural Gas	Crude Oil	Fuel	Biofuel	LPG	Other Petroleum Product	Electricity	LNG *)	Total
1 Primary Energy Supply	5,283	2,451	54,693	0	63,794	46,709	30,041	13,605	5,110	-3,981	1	-21,849	195,856
a. Production	5,283	2,451	290,787	0	72,056	43,022	0	13,605	0	0	0	0	427,204
b. Import	0	0	1,895	0	0	20,500	24,276	0	4,608	960	1	0	52,240
c. Export	0	0	-230,485	0	-8,262	-17,253	-314	0	0	-4,941	0	-21,849	-283,105
d. Stock Change	0	0	-7,503	0	0	439	6,080	0	501	0	0	0	-483
2 Energy Transformation	-5,283	-2,451	-44,159	8	-42,761	-45,793	13,472	0	3,044	15,604	21,515	27,041	-59,764
a. Refinery	0	0	0	0	-638	-45,793	23,472	0	700	15,604	0	0	-6,656
b. Gas Processing	0	0	0	0	-28,303	0	0	0	2,344	0	0	27,041	1,082
c. Coal Processing Plant	0	0	-9	8	0	0	0	0	0	0	0	0	-1
e. Power Plant	-5,283	-2,451	-44,150	0	-13,820	0	-9,999	0	0	0	21,515	0	-54,189
- State Own Utility (PLN)	-3,779	-1,046	-30,867	0	-12,298	0	-10,347	0	0	0	16,227	0	-42,110
- Independent Power Producer (Non-PLN)	-1,505	-1,404	-13,283	0	-1,522	0	347	0	0	0	5,288	0	-12,079
3 Own Use and Losses	0	0	0	0	-6,412	-916	-79	-27	0	0	-2,836	-5,182	-15,452
a. During Transformation	0	0	0	0	-638	-916	0	0	0	0	-808	0	-2,362
b. Energy Use/ Own Use	0	0	0	0	-5,773	0	0	0	0	0	0	0	-5,773
c. Transmission & Distribution	0	0	0	0	0	0	-79	-27	0	0	-2,028	-5,182	-7,316
4 Final Energy Supply	0	0	10,534	8	14,621	0	43,434	13,578	8,154	11,623	18,679	10	120,640
5 Statistic Discrepancy	0	0	0	0	-3,960	0	0	0	0	0	28	10	-3,923
6 Final Energy Consumption	0	0	10,534	8	18,582	0	43,434	13,578	8,154	11,623	18,652	0	124,563
a. Industry	0	0	10,534	8	13,940	0	4,020	0	118	0	5,892	0	34,511
b. Transportation	0	0	0	0	37	0	35,778	13,578	0	0	19	0	49,412
c. Household	0	0	0	0	17	0	586	0	7,819	0	8,154	0	16,577
d. Commercial	0	0	0	0	215	0	508	0	217	0	4,586	0	5,526
e. Other Sector	0	0	0	0	0	0	2,543	0	0	0	0	0	2,543
7 Non Energy Use	0	0	0	0	4,372	0	0	0	0	11,623	0	0	15,995

POTENTIAL RENEWABLE ENERGY

Hydropower
75 GW



5,02 GW (7%)

Solar
532,6 GWp



0,08 GWp (0,01%)

GEO THERMAL
29,5 GW



1,44 GW (5%)

Wind
113,5 GW



6,5 MW (0,01%)

Bioenergy
32,6 GW



1,74 GW (5,3%)

OCEAN
18 GW



0,3 MW (0,002%)

**801,2
GW**

8,66 GW

Current All Capacity

55.528 MW *

Planning Capacity

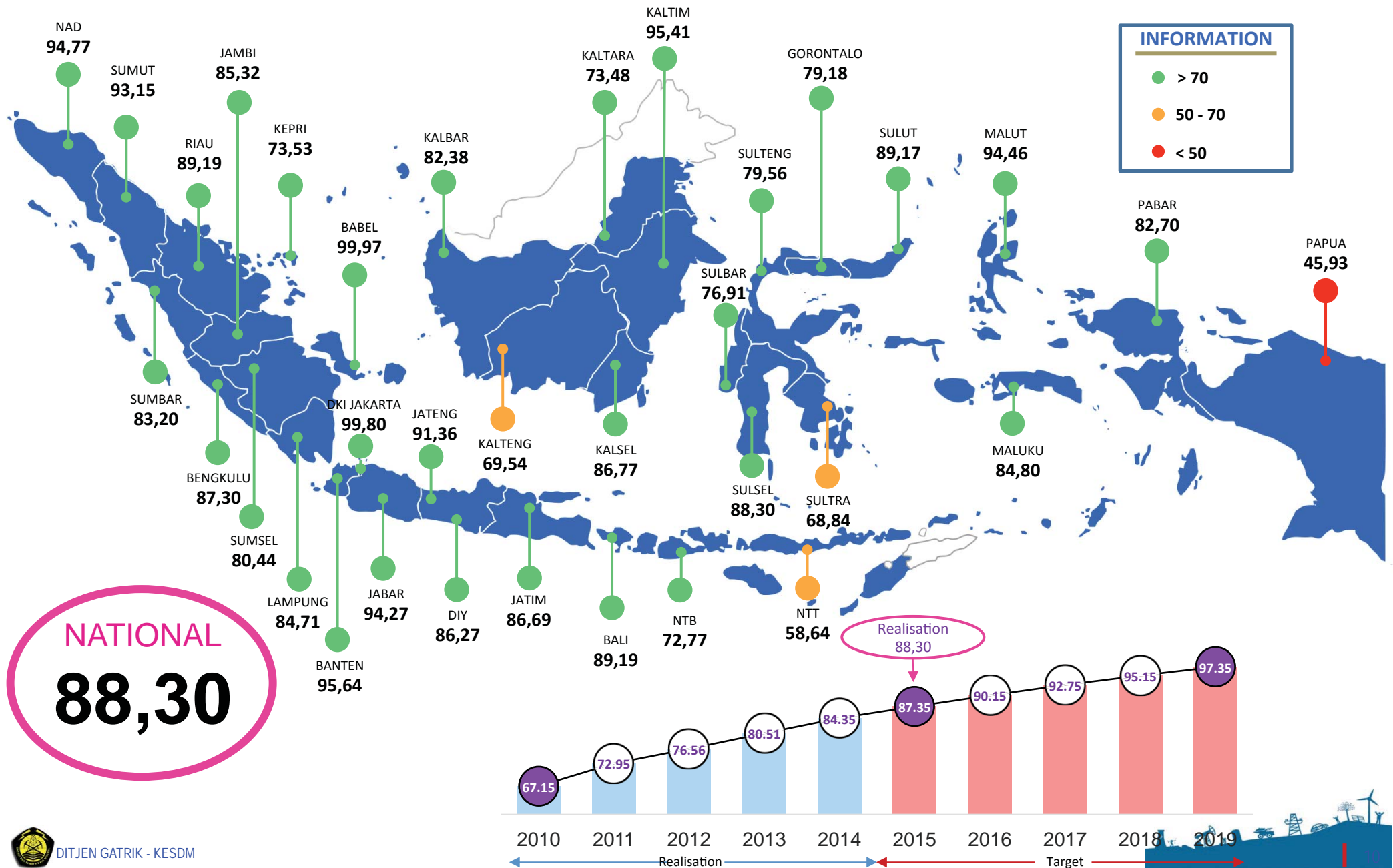
35.000 MW
+7.500 MW

New project

*) Data On Grid Only



ELECTRIFICATION RATIO 2015 (%)



GEOHERMAL RESOURCES AND RESERVES 2015

(MW)

No	Location	Resources		Reserves			Total
		Speculative	Hipotethic	Probable	Possible	Proven	
1	Sumatera	3,191	2,334	6,992	15	380	12,912
2	Jawa	1,560	1,739	4,023	658	1,815	9,795
3	Bali-Nusa Tenggara	295	431	1,179	0	15	1,920
4	Sulawesi	1,221	318	1,441	150	78	3,208
5	Maluku	560	91	800	0	0	1,451
6	Kalimantan	153	30	0	0	0	183
7	Papua	75	0	0	0	0	75
Total		7,055	4,943	14,435	823	2,288	29,544



GEOHERMAL POWER PLANT CAPACITY 2015

(MW)

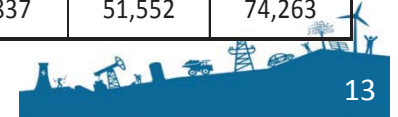
No	Working Area	Location	IPB Owner	Turbine Capacity	Operator Steam Area	Operator PLTP	Total Capacity
1	PLTP Kamojang	West Java	PT. Pertamina Geothermal Energy (PGE)	1 x 30 MWe	PGE	PLN	235
				2 x 55 MWe			
				1 x 60 MWe		PGE	
				1 x 35 MWe			
2	PLTP Lahendong	North Sulawesi	PT. Pertamina Geothermal Energy (PGE)	4 x 20 MWe	PGE	PLN	80
3	PLTP Sibayak	North Sumatera	PT. Pertamina Geothermal Energy (PGE)	1 x 12 MWe	PGE	PT. Dizamatra Powerindo	12
4	PLTP Salak	West Java	PT. Pertamina Geothermal Energy (PGE)	3 x 60 MWe	CGS	PLN	377
				3 x 65,6 MWe		CGS	
5	PLTP Darajat	West Java	PT. Pertamina Geothermal Energy (PGE)	1 x 55 MWe	CGI	PLN	270
				1 x 94 MWe		CGI	
				1 x 121 MWe		CGI	
6	PLTP Wayang Windu	West Java	PT. Pertamina Geothermal Energy (PGE)	1 x 110 MWe	SE	SE	227
				1 x 117 MWe			
7	PLTP Dieng	Central Java	PT. Geo Dipa Energy (GDE)	1 x 60 MWe	GDE	GDE	60
8	PLTP Ulubelu	Lampung	PT. Pertamina Geothermal Energy (PGE)	2x 55 Mwe	PGE	PLN	110
9	PLTP Ulumbu	NTT	PT. PLN (Persero)	4x2,5 Mwe	PLN	PLN	10
10	PLTP Mataloko	NTT	PT. PLN (Persero)	1x 2,5 Mwe	PLN	PLN	2.5
11	PLTP Patuha	West Java	PT. Geo Dipa Energy (GDE)	1x 55 Mwe	GDE	GDE	55
					Total	Total	1,438.5



GEOHERMAL STEAM PRODUCTION

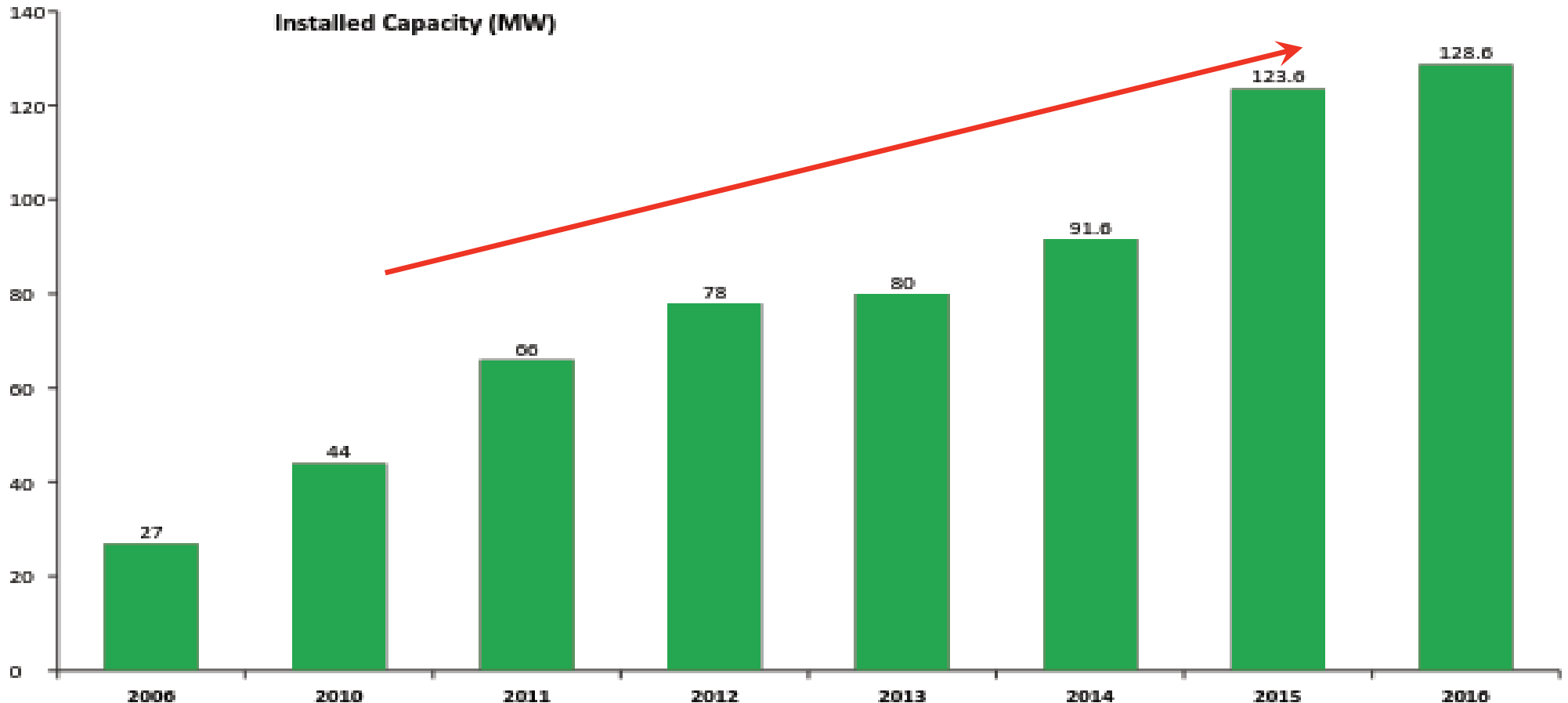
(Thousand Tonnes Geothermal Steam)

Year	Pertamina Field					KOB Field								Total
	Kamojang	Sibayak	Lahendong	Ulubelu	Sub Total	Salak	Darajat	Wayang Windu	Dieng	Ulumbu	Mataloko	Patuha	Sub Total	
2000	8,238	66.00	-		8,304	19,494	4,876	3,717	-				28,087	36,391
2001	8,623	242.00	457		9,322	22,044	7,242	6,669	-				35,955	45,277
2002	9,292	212.00	954		10,458	21,742	7,453	6,929	-				36,124	46,582
2003	9,274	42.00	1,132		10,448	21,325	7,435	6,431	1,521				36,712	47,160
2004	9,277	126.00	1,173		10,576	22,595	8,011	6,863	2,305				39,774	50,350
2005	7,462	74.00	1,012		8,548	24,167	7,551	6,809	2,518				41,045	49,593
2006	8,096	164.69	1,240		9,501	24,527	7,633	6,625	2,544				41,330	50,831
2007	8,121	84.31	1,311		9,517	24,346	10,322	6,524	1,209				42,400	51,917
2008	12,100	288.76	2,349		14,738	24,482	13,487	6,665	1,644				46,279	61,016
2009	12,612	497.92	2,665		15,775	24,538	13,977	12,989	780				52,285	68,060
2010	12,446	548.41	2,964		15,959	24,272	14,264	13,675	1,221				53,433	69,391
2011	12,470	310.00	2,510		15,290	24,673	14,131	13,523	1,106				53,433	68,723
2012	10,878	160.36	3,262	1,393	15,694	24,513	14,283	13,233	1,047				53,076	68,770
2013	11,256	238.67	3,841	5,575	20,910	23,728	10,678	13,378	348	253	0	0	48,386	69,296
2014	10,489	183.98	4,138	6,174	20,985	24,307	13,856	13,143	205	261	0	840	52,613	73,598
2015	11,974	0.37	4,693	6,044	22,711	24,755	13,916	7,850	1,770	382	41	2,837	51,552	74,263



ACHIEVEMENT BIOENERGY POWER PLANT ON-GRID

Biomass potential in Indonesia can generate electricity up to 32 GW



Install Capacity Bioenergi Power Plant **128,6 MW**:

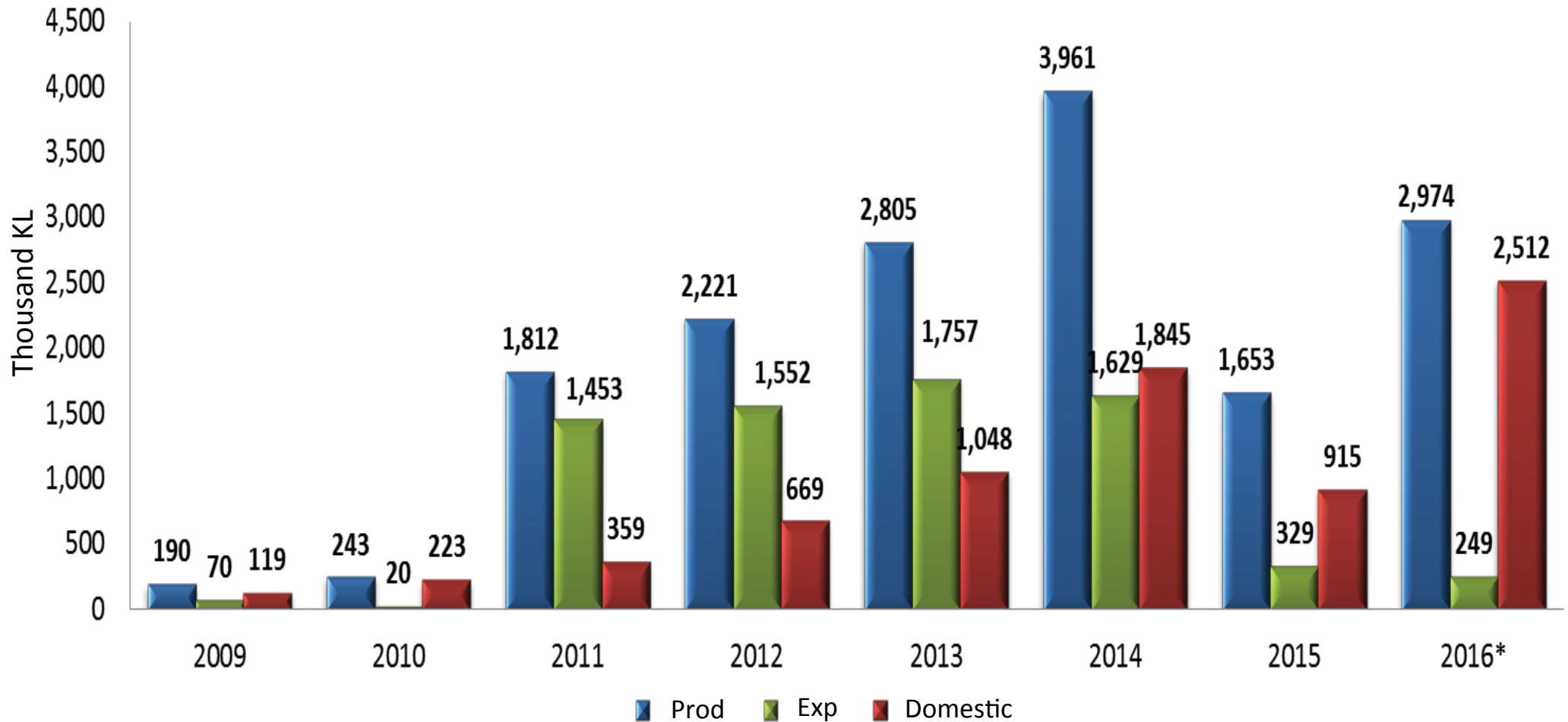
- Bio Mass: 102,4 MW
- Bio Gas/POME: 8,6 MW
- Municipal Waste: 17,6 MW

INSTALL CAPACITY "ON-GRID" POWER PLANT FROM BIOMASS, BIOGAS & MUNICIPAL WASTE until 2016

NO	NAME	COD	CONTRACT	LOCATION	REGION OF PLN	TYPE	MW
1	PT Growth Sumatra 1	2006	Excess power	North Sumatera	PLN Reg North Sumatera	Palm waste	9
2	PT Listrindo Kencana	2006	IPP	Bangka	PLN Reg Bangka	Palm waste	5
3	PT Indah Kiat Pulp & Paper	2006	Excess power	Riau	PLN Reg Riau	palm waste	3
4	PT Belitung Energy	2010	IPP	Belitung	PLN Reg Babel	Palm waste	7
5	PT Growth Sumatra 2	2010	Excess power	Sumatera Utara	PLN Reg North Sumatera	Palm waste	10
6	PT Growth Asia	2011	Excess power	Sumatera Utara	PLN Reg North Sumatera	Palm waste	10
7	PT Navigat Organic	2011	IPP	Bekasi	PLN Reg West Java	MSW	12
8	PT Navigat Organic	2012	IPP	Bali	PLN Dist Bali	MSW	2
9	PT Growth Asia	2012	Excess power	Sumatera Utara	PLN Reg Sumut	Palm waste	10
10	PT Navigat Organic	2013	IPP	Bekasi	PLN Dist West Java	MSW	2
11	PT Austindo ANE	2014	IPP	Belitung	PLN Reg Babel	POME	1,2
12	PT PLN	2014	PLN	Gorontalo	PLN Sulutenggo	Meize	0,4
13	PT Rimba Palma	2014	Excess power	Jambi	PLN Reg S2JB	Palm waste	10
14	PT Victorindo	2015	Excess Power	Sumatera Utara	PLN Reg North Sumatera	Palm Waste	3
15	PT Harkat Sejahtera	2015	Excess power	Sumatera Utara	PLN Reg North Sumatera	Palm waste	10
16	PT Sumber Organik	2015	IPP	Surabaya	PLN Reg East Java	MSW	1,6
17	PT Meskom Agro Sarimas	2015	Excess power	Riau	PLN Reg Riau	Palm waste	10
18	Maju Aneka Sawit	2015	Excess power	Kalimantan selatan	PLN Reg Kalselteng	POME	1
19	Sukajadi Sawit	2015	Excess power	Kalimantan selatan	PLN Reg Kalselteng	POME	2,4
20	Mutiara Bunda	2015	Excess power	Sumatera Selatan	PLN Reg S2JB	POME	2
21	Sampurna	2015	Excess power	Sumatera Selatan	PLN Reg S2JB	POME	2
22	PT Riau Prima Energy	2016	Excess power	Riau	PLN Reg Riau	Biomass	15
23	PTPN III	2016	Excess power	Sumatera Utara	PLN Reg North Sumatera	Palm waste	1.8
24	Siringo-ringo	2016	Excess power	Sumatera Utara	PLN Reg North Sumatera	POME	1
TOTAL CAPACITY "ONGRID"							131,4



BIODIESEL SUPPLY



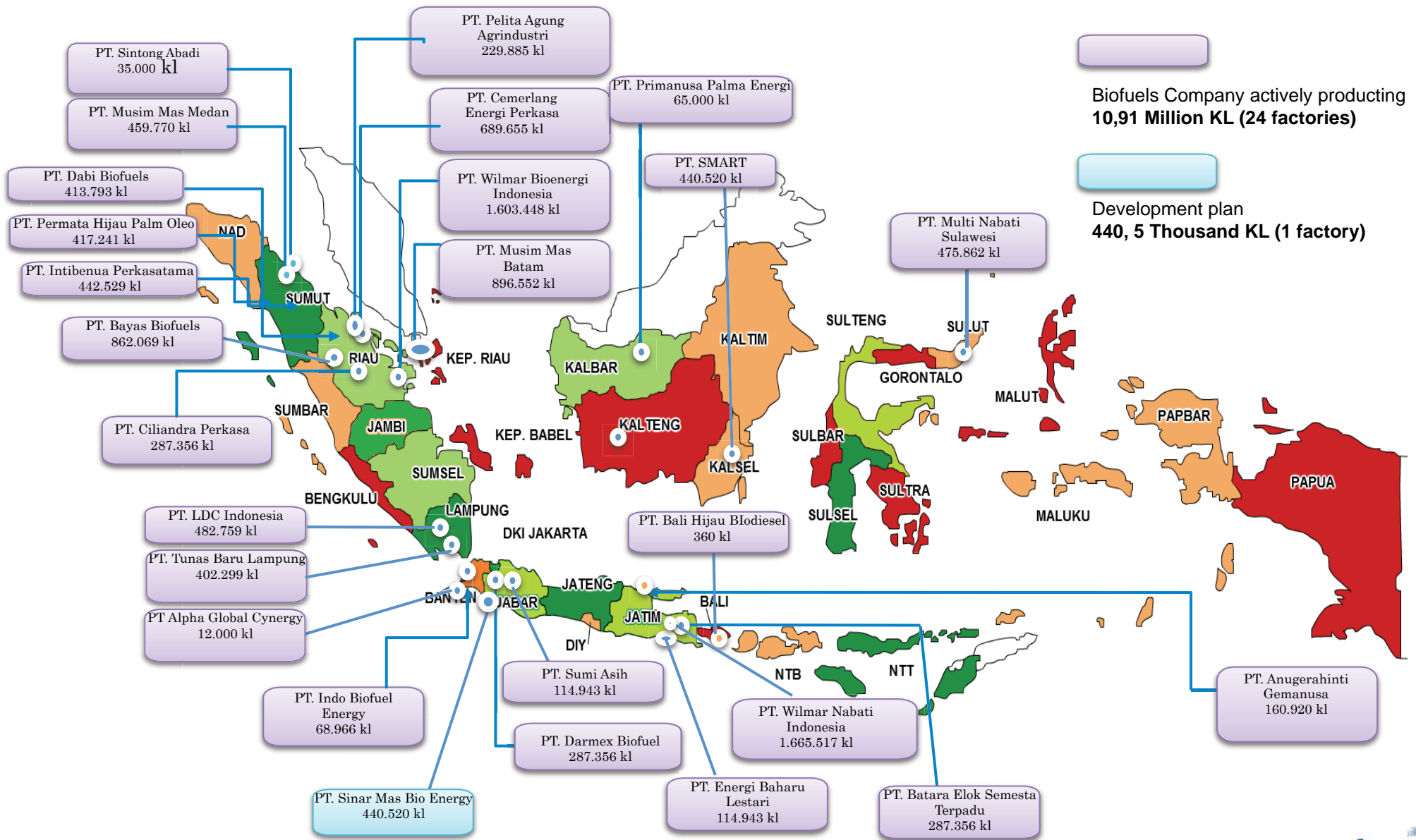
CAPACITY BIOFUEL INDUSTRY 2015

Province	Biodiesel (Thousand KL)	Bioethanol (Thousand KL)
DKI Jakarta	65,000	
Banten	80,966	
West Java	402,299	
East Java	1,883,908	40,000
Bali	360	
Riau	3,287,356	
North Sumatera	35,000	
East Kalimantan	862,069	
Central Kalimantan	0	
TOTAL	6,616,958	40,000

Note:FAME



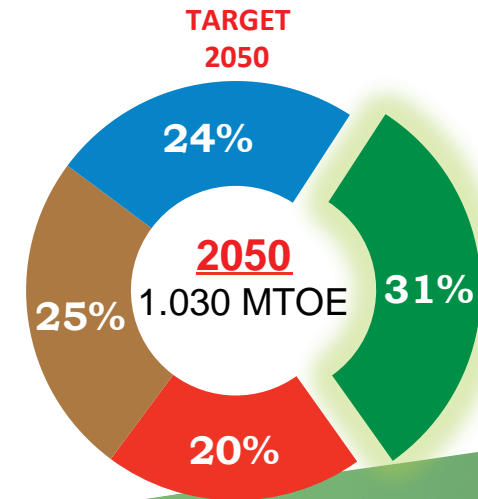
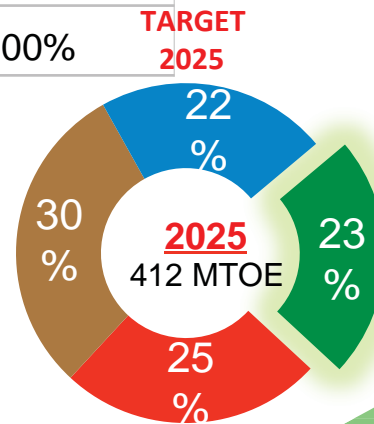
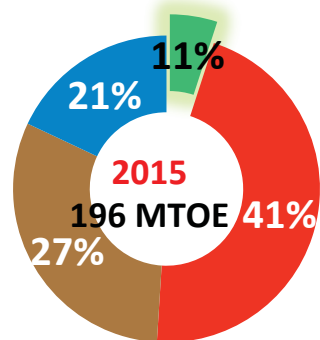
INSTALL CAPACITY OF BIODIESEL INDUSTRY (OCT 2016)



NATIONAL ENERGY POLICY

(Governance Regulation No. 79/2014)

	2025	2050
Energy Role	<i>as the national capital development</i>	
NRE on Energy Mix	<23%	<31%
Energy Supply	> 400 MTOE	> 1.000 MTOE
Power plants	> 115 GW	> 430 GW
Energy Elasticity	< 1	< 1
Electricity /capita/ years	2.500 kWh	7.000 kWh
Electrification Ratio	~100%	~100%



■ NRE
■ Crude Oil
■ Natural Gas
■ Coal

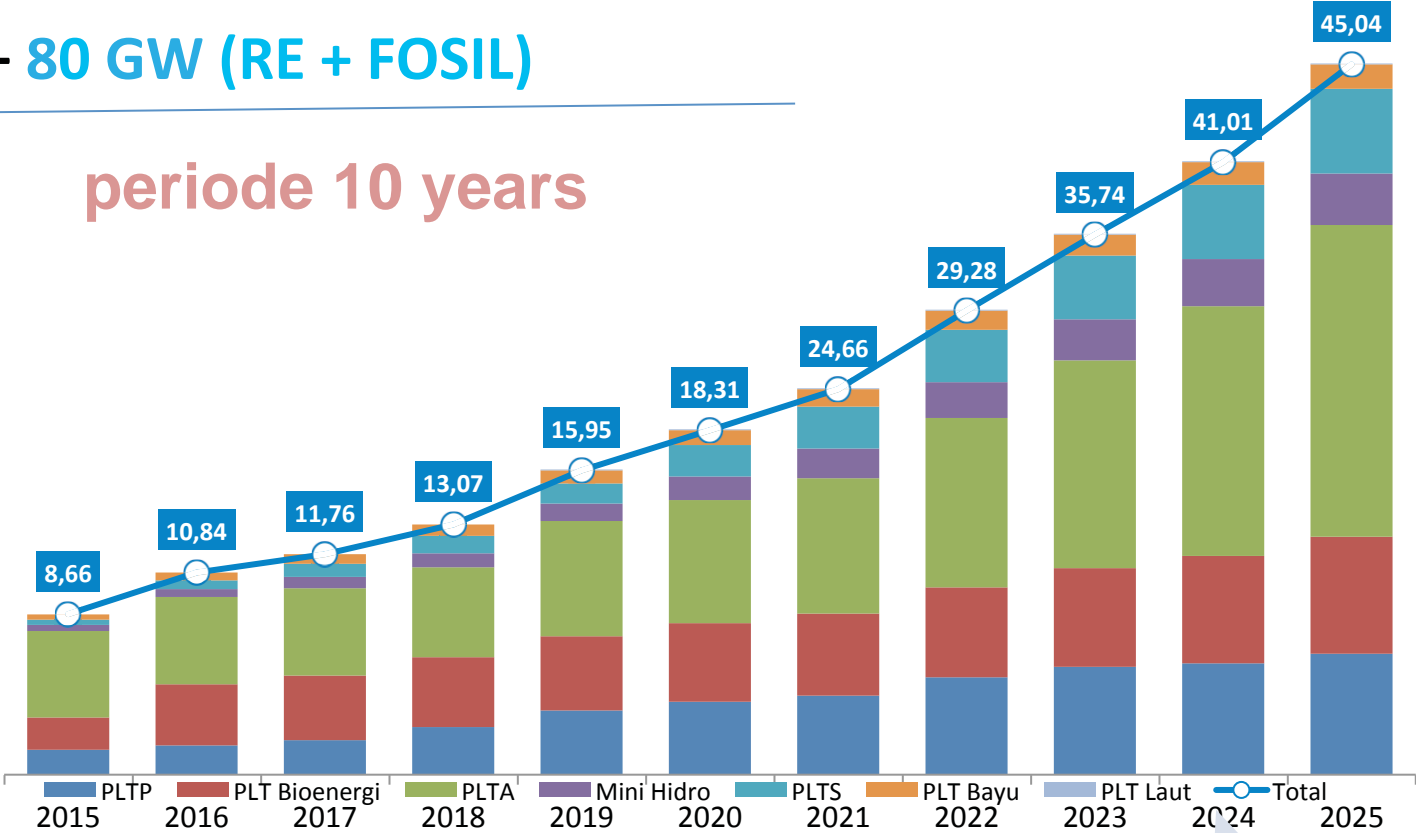


NRE TARGET ON 2025

+ 36,3 GW (RE)

+ 80 GW (RE + FOSIL)

periode 10 years



	2025
Geothermal	7,2 GW
Hydro	21 GW
Bioenergi	5,5 GW
Solar PV	6,4 GW
Wind	1,8 GW
Ocean (*)	3,1 GW
Grand Total for RE	45 GW

	Current Condition
Grand Total Installed Capacity	55 GW
Capacity Power Plant for RE	8,7 GW (15,7%)



	2025
Grand Total Installed Capacity	135 GW
Capacity Power Plant for RE	45 GW (33%)



STRATEGY AND DEVELOPMENT OF POWER PLANTS RENEWABLE ENERGY 2015-2025

SHARE	2015	2016	2017	2018	2019	2020	2025
OIL	37%	35%	34%	32%	31%	29%	25%
GAS	21%	21%	21%	21%	21%	21%	22%
COAL	33%	33%	34%	35%	36%	36%	30%
NRE	10%	10%	11%	12%	13%	14%	23%
TOTAL	100%	100%	100%	100%	100%	100%	100%



POWER PLANT	2015	2016	2017	2018	2019	2020	2025
Geothermal	1.439	1.654	2.004	2.344	2.979	3.804	7.239
Hydro	5.024	5.139	5.266	5.619	7.154	7.735	20.960
Bio	1.740	1.886	2.093	2.359	2.674	3.024	5.532
Solar	79	229	429	679	979	1.379	6.379
Wind	7	57	107	207	307	507	1.807
Other	372	1.860	1.860	1.860	1.861	1.863	3.128
TOTAL	8.660	10.842	11.758	13.067	15.953	18.310	45.044

STRATEGY

1. Realizing clean bureaucrats, accountable, effective, efficient and serve;
2. Completing regulations;
3. Simplify licensing and non-licensing;
4. Provide incentives;
5. Providing subsidies NRE;
6. Improving coordination with the Ministries / Agencies, Local Government and the Association;
7. Promote energy-saving campaign;
8. Update the data in the potential of renewable energy;
9. Strengthening networks;

+ 36,6 GW POWER PLANT NRE

10 TAHUN

**AVERAGE PER YEAR 3,6 GW
NEEDED ± IDR 1.600 trillion**



POLICY BIOFUEL

Mandatory Implementation of Biofuel MEMR Regulation No 12/2015*

BIODIESEL (Minimum)

Sektor	April 2015	January 2016	Januari 2020	Januari 2025
Macro Business, Fishery, Agriculture, Pubic Services (PSO)	15%	20%	30%	30%
Transportation Non PSO	15%	20%	30%	30%
Industry and Comercial	15%	20%	30%	30%
Power Plant	25%	30%	30%	30%

Note : third revised regulation



FiT (*Feed in Tariff*)

TYPE	REGULATION FEED IN TARIFF (FIT)	GLOSS
Solar Power Plant	MEMR Regulation No. 19/2016	Set the price of electricity in 22 regions with a ceiling price based on installed capacity (MW)
Biomass Power Plant	MEMR Regulation No. 21/2016	Set the price of electricity with installed capacity of less than or equal to 20 MW connected to the low, medium and high voltage, and set the price of electricity with installed capacity of greater than 20 MW connected at high voltage
Biogas Power Plant	MEMR Regulation No. 21/2016	
Municipal Waste Power Plant	MEMR Regulation No. 44/2015	
Hydro Power Plant	MEMR Regulation No. 19/2015	Set the price of electricity based on the type of technology, installed capacity (MW) and year of production



CHALLENGES WITH DATA COLLECTION

- Lack of legislation / regulation
 - ✓ Based on voluntary system → no punishment
- Geographics & Bureaucracy
 - ✓ Indonesia have many islands and Local Governments that have different authority
- Data Condition
 - ✓ There is no standard format of data on EMR sector
 - ✓ There is still no dedicated person in charge of data processing, especially in the local government's EMR offices. While in the directorate generals, the data is scattered among different divisions, making data collecting a difficult process.
- Human resources
 - ✓ Lack of human resources (competent person in charge of data processing)
- Change of staff – lack of continuity
 - ✓ Rotation and mutation of the person in charge (PIC) in units/companies/data sources.



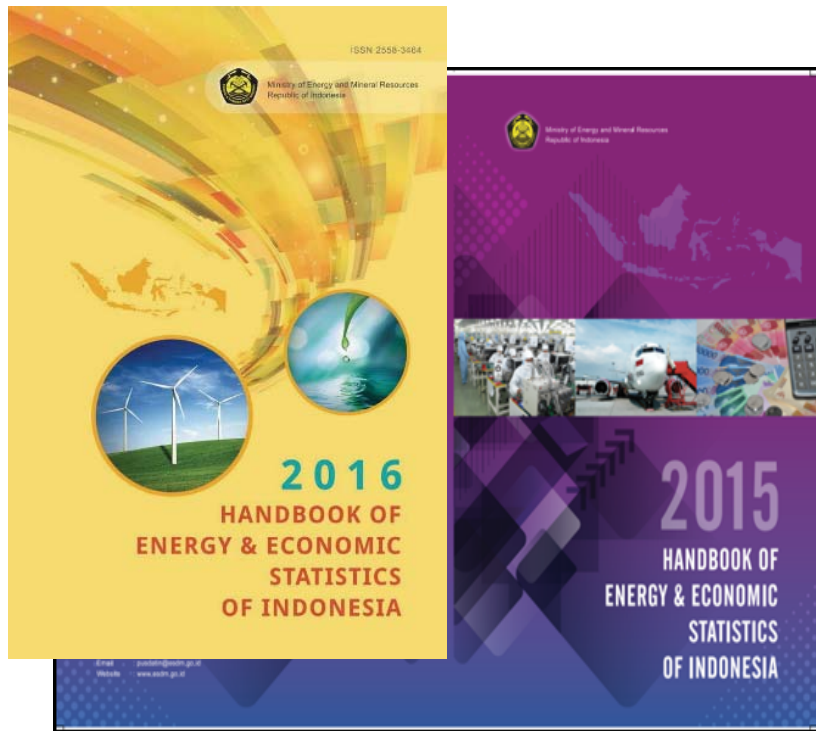
RECOMMENDATION

- Lack of legislation / regulation
 - ✓ There must be rules of data delivery and punishment
- Geographics & Bureaucracy
 - ✓ improve coordination and develop a data delivery system
- Data Condition
 - ✓ Close coordination needed to prepare common data format
- Human resources
 - ✓ Special recruitment for data processing for the local government's. Socialize Standard Operating Procedure of data collecting and processing. And centralizing data in The Directorate General under The Ministry of Energy and Mineral Resources.
 - ✓ Additional recruitment human resource for Data Center EMR and increasing processing competence



PUSDATIN PUBLICATION

**Handbook of Energy & Economic Statistics of Indonesia
(every end of year)**



**Analyze and Recommendation of EMR Sector
(every year-thematic)**



<http://www2.esdm.go.id/publikasi/statistik/handbook>





Thank You

Email: pengelolaan@esdm.go.id

www.esdm.go.id

