



Waste to Energy Status in Indonesia

Fadjar Goembira

Andalas University, INDONESIA



Where is Indonesia?



...the archipelago



Electrification Ratio



Solid waste generation





Projection of solid waste generation









Source: Ministry of Civil Works, 2016

Waste from Palm Oil Mills





19,671 tons POME/hour + 9,835.5 tons solid waste/hour

Source: Ministry of Energy and Mineral Resources, 2017















Main Policy for Renewable Energy

POLICIES AND REGULATIONS (1)

LAW NO. 30 year 2007 on Energy

GOVERNMENT REGULATION NO. 79 year 2014 on National Energy Policy

PRESIDENTIAL INSTRUCTION NO. 1 year 2006 on Provision and Utilization, of Biofuel as Other Fuel

MINISTERIAL OF ENERGY AND MINERAL **RESOURCES REGULATION NO. 32 year 2008** on Supply, Utilization, & Trading of Biofuel as Other Fuel

MINISTERIAL OF ENERGY AND MINERAL RESOURCES REGULATION NO. 25 year 2013, No. 20 year 2014 & NO. 12 year 2015

an amendment to Regulation of MEMR No. 32 of 2008.

MINISTERIAL OF ENERGY AND MINERAL **RESOURCES REGULATION No. 50 year 2017**

MINISTERIAL OF ENERGY AND MINERAL **RESOURCES REGULATION No. 26 year 2016** Prioritize the supply and utilization of renewable energy, one of which is bioenergy.

Biofuel is targeted to contribute 10% to the national energy mix bv 2025.

Instructions related to the Minister, Governor and Mayor to take action in order to accelerate the provision and utilization of biofuel;

- Prioritize the supply and utilization of biofuel,
- 2. Mandatory biofuel utilization framework in various sectors,
- 3. Regulate the type, standard and guality of biofuel,
- 4. Set the pricing policy,
- 5. Regulate biofuel business and trade activities.

Accelerate the mandatory utilization of biofuel

Feed-in Tariff for electricity generated from NRE

CPO Fund to ensure the sustainability of Palm Oil and **Biodiesel Industry**







POLICIES AND REGULATIONS (2)

1. LAW NO. 30 YEAR 2007 concerning on Energy

• Priority supply and use of renewable energy, one of them is bioenergy

2. LAW NO. 18 YEAR 2008 concerning on Waste Management

Management of MSW to improve people's health, environment quality, and waste as a resource

3. LAW NO. 32 Year 2009 concerning on Environmental Protection and Management

 Protection and environmental management is a systematic and integrated efforts are being made to preserve the environment and prevent pollution and / or damage to the environment.

3. GOVERNMENT REGULATION NO 79 YEAR 2014 concerning on National Energy Policy

- Optimize the utilization of biofuel
- Increase NRE contribution in the total energy mix up to 23% by 2025 and 31% by 2050

4. GOVERNMENT REGULATION NO 27 Year 2012 Concerning Environmental Permits

• Regulating permits for Environmental Impact Assessment, Environmental Management Effort and Environmental Monitoring Effort (UKL/UPL), & Statement of Environmental Management (SPPL)

5. Other Regulations

Waste to Energy in Indonesia



1. Biomass power generation.

→ majority feedstocks are from palm shell, fiber, and Empty Fruit Bunch (EFB).





Shell

EFB

Fiber

2. Biogas power generation.

→ from liquid waste of palm industry, Palm Oil Mill Effluent (POME).





MSW power generation.
→ from Municipal Solid Waste.



POME



Biomass Potential for Electricity



No	Potential (<u>M</u> We)	Unit	Sumatera	Kalimantan	Jawa-Bali- <u>M</u> adura	Nusa Tenggara	Sulawesi	Maluku	Papua	Total
1	Palm oil	MWe	8,812	3,384	60		323		75	12,654
2	Sugar cane	MWe	399	-	854		42			1,295
3	Rubber	MWe	1,918	862	-	-	-	-		2,781
4	Coconut	MWe	53	10	37	7	38	19	14	177
5	Rice husk	MWe	2,255	642	5,353	405	1,111	22	20	9,808
6	Corn	MWe	408	30	954	85	251	4	1	1,733
7	Cassava	MWe	110	7	120	18	12	2	1	271
8	Wood	MWe	1.212	44	14	19	21	4	21	1,335
9	Cow dung	MWe	96	16	296	53	65	5	4	535
10	MSW	MWe	326	66	1.527	48	74	11	14	2.066
	Total potential	MWe	15,588	5,062	9,215	636	1,937	67	151	32,654



biomass, biogas and municipal solid waste in 2016 are 186MW:

- Solid Palm Oil Waste: 123.8 MW
- Liquid Palm Oil Waste/POME: 9.6 MW
- MSW: 16 MW
- Other biomass: 34 MW

Source: Ministry of Energy and Mineral Resources, 2017

OFF GRID = 1,645 MW Total ON + OFF Grid= 1,831 MW

Target (2025): 5.5 GW

No.	Company	COD	Туре	MW	No.	Company	COD	Туре	MW
1	PT Growth S. 1	2006	EP	9.0	17	Maju Aneka S.	2015	EP	1.0
2	PT Listrindo K.	2006	IPP	5.0	18	Sukajadi Sawit	2015	EP	2.4
3	PT Indah Kiat	2006	EP	3.0	19	Mutiara Bunda	2015	EP	2.0
4	PT Belitung E.	2010	IPP	7.0	20	Sampurna	2015	EP	2.0
5	PT Growth S. 2	2010	EP	10.0	21	PT Riau P. E.	2016	EP	15.0
6	PT Growth Asia	2011	EP	10.0	22	PTPN III	2016	EP	1.8
7	PT Navigat O.	2011	IPP	12.0	23	Sringo-ringo	2016	EP	1.0
8	PT Navigat O.	2012	IPP	2.0	24	Listrindo K.	2017	IPP	5.0
9	PT Growth Asia	2012	EP	10.0	25	Tanjung Batu	2017	IPP	1.0
10	PT Navigat O.	2013	IPP	2.0	26	PT Riau P. E.	2017	EP	10.0
11	PT Austindo ANE	2014	IPP	1.2	27	Rimba Palma 2	2017	EP	10.0
12	PT Rimba P.	2014	EP	10.0	28	PT Harkat S. 2	2017	EP	20.0
13	PT Victorindo	2015	EP	3.0	29	PT Gunung P. L.	2017	EP	1.2
14	PT Harkat S.	2015	EP	10.0	30	PT Inhil S. K.	2017	EP	5.0
15	PT Sumber O.	2015	IPP	1.6	31	PT United K.	2017	EP	0.8
16	PT Meskom A. S.	2015	EP	10.0	32	PTPN X	2017	EP	2.0
Source: Ministry of Energy and Mineral Resources, 2017								Total	186.0



Thank you very much for your kind attention...



