

Alternative Energy Development Plan 2015-2036 (AEDP 2015)

under

Power Development Plan 2015-2036 (PDP2015)

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Biogas in Thailand
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Presentation Contents

- 1. AEDP (2012-2021)**
- 2. AEDP 2015 (2015-2036) and Supporting Measures.**
- 3. Biogas Development in Thailand**



Alternative Energy Development Plan (AEDP : 2012-2021)

AEDP
(2012 -2021)



Target **25 %** of RE in total energy consumption by 2021

Solar & Wind

Hydro power

Bioenergy

New energy



Total electricity target



Total heat target

9,800 Ktoe

Biofuel



Biofuel targets

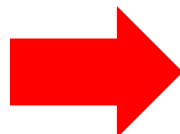
Ethanol	Biodiesel	Advanced biofuel
9 ML/day	7.20 ML/day	3 ML/day

Targets and Current situations AEDP 2012-2021

Technology	Unit	Target2021	Status		
			2012	2013	2014
<u>Electricity</u>	MW	13,927	2,786	3,788	4,494
	ktoe	5,370	1,138	1,341	1,467
1.Solar Energy	MW	3,000	376.72	823.46	1,298.51
2.Wind Energy	MW	1,800	111.73	222.71	224.47
3.Small Hydro power	MW	324.00	101.75	108.80	142.01
4.Biomass	MW	4,800	1,959.95	2,320.78	2,451.82
5.Biogas	MW	3,600	193.40	265.23	311.50
6.MSW	MW	400	42.72	47.48	65.72
7. New Energy	MW	3.00	-	-	-
<u>Heat</u>	ktoe	9,801	4,886	5,279	5,775
1.Solar Energy	ktoe	100	3.50	4.50	5.12
2.Biomass	ktoe	8,500	4,346	4,694	5,184
3.Biogas	ktoe	1,000	458.0	495.0	488.10
4.MSW	ktoe	200	78.2	85.0	98.10
<u>Biofuels</u>	ML/d	19.20	4.20	5.50	6.10
	ktoe	9,467	1,270	1,612	1,783
1.Ethanol	ML/d	9.00	1.40	2.60	3.21
2.Bidiesel	ML/d	7.2	2.80	2.90	2.89
3. Advanced	ML/d	3.00	-	-	-
4. CBG	ML/d	1,200	-	-	-
RE Consumption (ktoe)		24,638	7,294	8,232	9,025
Total Final Energy Consumption (ktoe)		99,838	73,316	75,214	75,804
Status of RE Consumption(%)		25%	9.95 %	10.94%	11.91%

Energy Plans Revision

Power Development Plan :
PDP 2010 Rev.3
(2010 – 2030)



Power Development Plan :
PDP 2015 (2015 – 2036)
On 14 May 2015, The National Energy
Policy Committee (NEPC) approved PDP 2015

Alternative Energy Development Plan:
AEDP
(2012 – 2021)



Alternative Energy Development Plan:
AEDP 2015
(2015 – 2036)
Revision in Progress

Energy Efficiency Development Plan:
EEDP 20 Year
(2011 – 2030)



**Energy Efficiency Development
Plan: EEDP 2015**
(2015 – 2036)
Revision in Progress

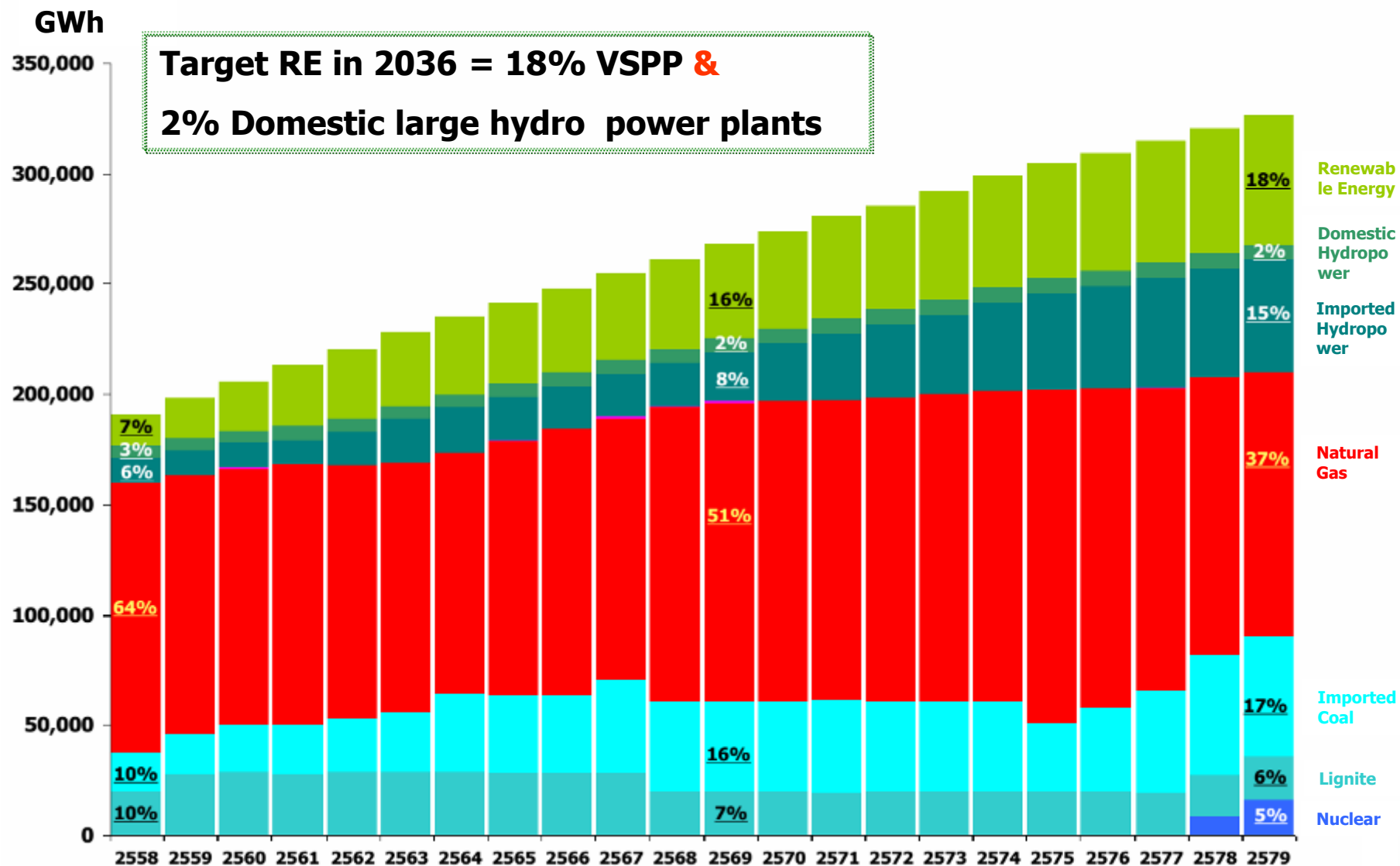
The time frame of the 3 plans, approved by The National Energy Policy Committee on 15 August 2014

Initial Concepts for AEDP 2015

- 1) Promotion of power generation from MSW, biomass and biogas, to benefit both farmer and communities.
 - MSW 500 MW
 - Biomass 5,570 MW
 - **Biogas 600 MW(Industrial waste&Livestock farms)+680 (Energy Crops)**
- 2) Set up target of the provincial RE development by zoning of electricity demand and RE potential
- 3) Power generation from solar and wind if the investment cost will be able to compete with power generation using LNG
- 4) Incentives for using competitive bidding, and promoting the utilization by energy consumption reduction (net metering or self-consumption)

Overview of PDP 2015

Power production, classified by fuel type

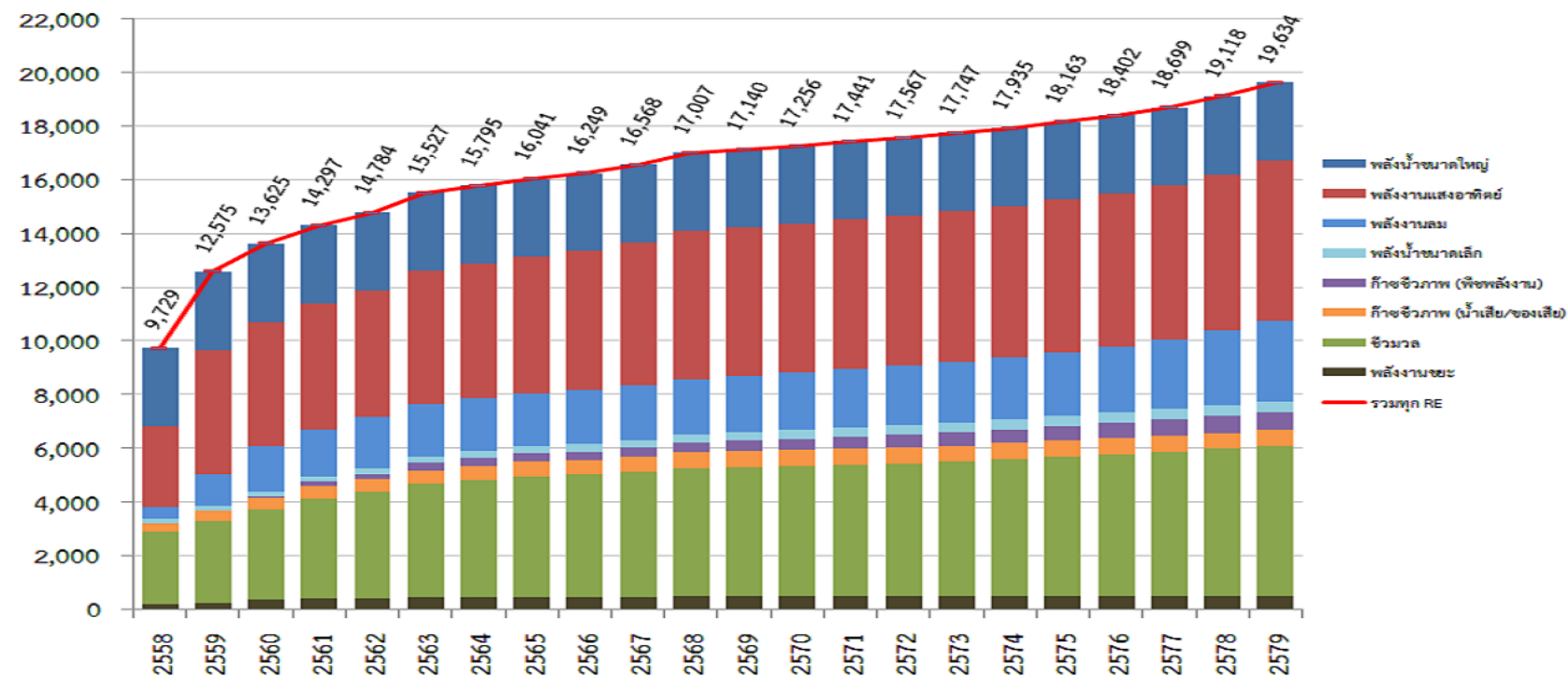


AEDP under PDP 2015

AEDP targets and current situations in the form of electricity

Type	MSW	Biomass	Biogas (Waste)	Biogas (Energy Crop)	Small Hydro (<12 MW)	Solar	Wind	Large Hydro	Total
Status in 2014 (MW)	65.7	2,541.8	311.5	-	142.0	1,298.5	224.5	2,906.4	7,490.4
Target in 2036 (MW)	500.0	5,570.0	600.0	680.0	376.0	6,000.0	3,002.0	2,906.4	19,634.4

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Supporting Measures

- Exemption of import duty on equipment or machines
- Exemption of income-corporate taxes resulting from selling RE or saving energy for periods up to 8 years

Investment grants

BOI

Data Support

- One stop service center
- Data on renewable development progress
- Resource data maps, such as solar ,wind,biomass biogas and MSW

Feed-in Tariff (FIT)

- Premiums paid for renewable power generation
- Biomass : 4.24-5.34 THB/kWh
- Biogas: 3.76-5.34 THB/kWh
- MSW: 5.08-6.34 THB/kWh
- Wind: 6.06 THB/kWh
- Hydro: 4.90 THB/kWh
- Solar: 5.66-6.85 THB/kWh

ESCO fund

- Provides lower risk capital to renewable focused businesses
- Equity investment (ESCO venture capital)
- Equipment leasing
- Credit guarantee facility

Feed-in Tariff (FIT) Rate for VSPP projects

Fuel/ Installed Capacity	FIT (Baht/kWh)			Supporting period (y)	FIT Premium(Baht/kWh)	
	FIT_F	FIT_{V,2017}	FIT⁽¹⁾		Bioenergy Projects (First 8 y)	Projects in 3 Southern Provinces (2)
1) Municipal Solid Waste (MSW)						
Installed Capacity ≤ 1 MW	3.13	3.21	6.34	20	0.70	0.50
Installed Capacity > 1-3 MW	2.61	3.21	5.82	20	0.70	0.50
Installed Capacity > 3 MW	2.39	2.69	5.08	20	0.70	0.50
2) MSW(Landfill Gas)	5.60	-	5.60	10	-	0.50
3) Biomass						
Installed Capacity ≤ 1 MW	3.13	2.21	5.34	20	0.50	0.50
Installed Capacity > 1-3 MW	2.61	2.21	4.82	20	0.40	0.50
Installed Capacity > 3 MW	2.39	1.85	4.24	20	0.30	0.50
4) Biogas (Waste/Solid Waste)	3.76	-	3.76	20	0.50	0.50
5) Biogas(Energy Crop)	2.79	2.55	5.34	20	0.50	0.50
6) Hydro Power						
Installed Capacity ≤ 200 kW	4.90	-	4.90	20 ปี	-	0.50
7 Wind	6.06	-	6.06	20 ปี	-	0.50

Remarks

(1) This FiT rate applies to a project that delivers power into the grid in the year 2017. After 2017, the FiTv rate will be increased based on the core inflation rate. This only applies to waste (integrated waste management), biomass and biogas (energy plants) projects.

(2) Projects located in Yala, Pattani, Narathiwat and 4 Sub-districts in Songkla (Jana Sub-district, Tepha Sub-district, Sabayoi Sub-district and Natawee Sub-district) only.

Feed-in Tariff (FIT) Rate for VSPP Projects (Solar cell)

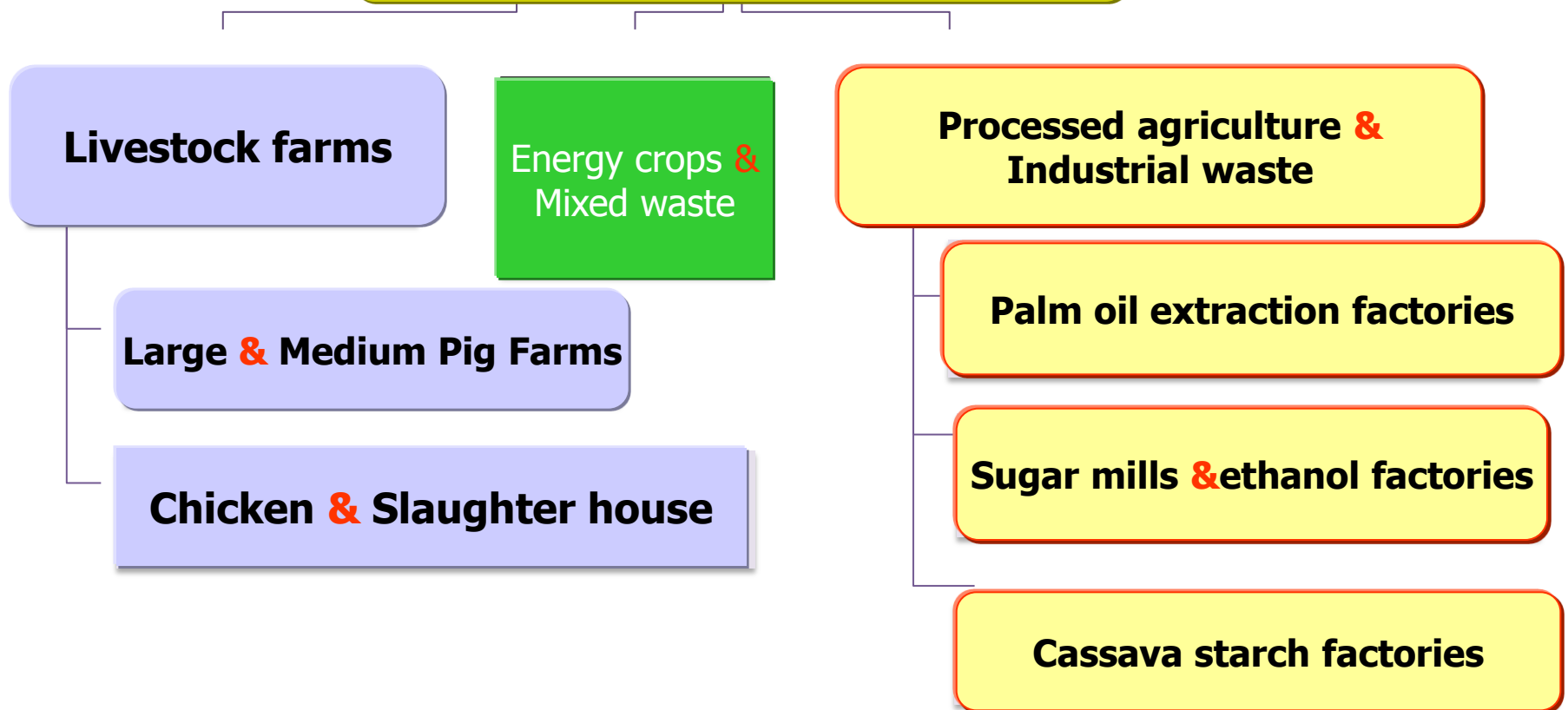
Installed Capacity	FIT (Baht/kWh)	Supporting period (y)	Project 3 southern provinces Premium(Baht/kWh)
Solar Farm			
≤ 90 MWp	5.66	25	0.50
PV rooftop (Households)			
≤ 10 kWp	6.85	25	0.50
PV rooftop (Business building/Factories)			
>10-250 kWp	6.40	25	0.50
>250-1,000 kWp	6.01	25	0.50
Solar cell for Government Sector and Agriculture Cooperative			
≤ 5MWp	5.66	25	0.50

Renewable Development Barriers

- 1. Protests by communities, especially biomass and MSW power plants;**
- 2. Limitation of grid connection due to inadequate capacity of transmission lines;**
- 3. License delays and long process for getting power purchase concession;**
- 4. Obstruction by laws or regulations;**
- 5. Lack of support from financial institutions;**
- 6. Changes in government policy.**

Biogas Development

Target Groups



Biogas Development

Current development progress of biogas

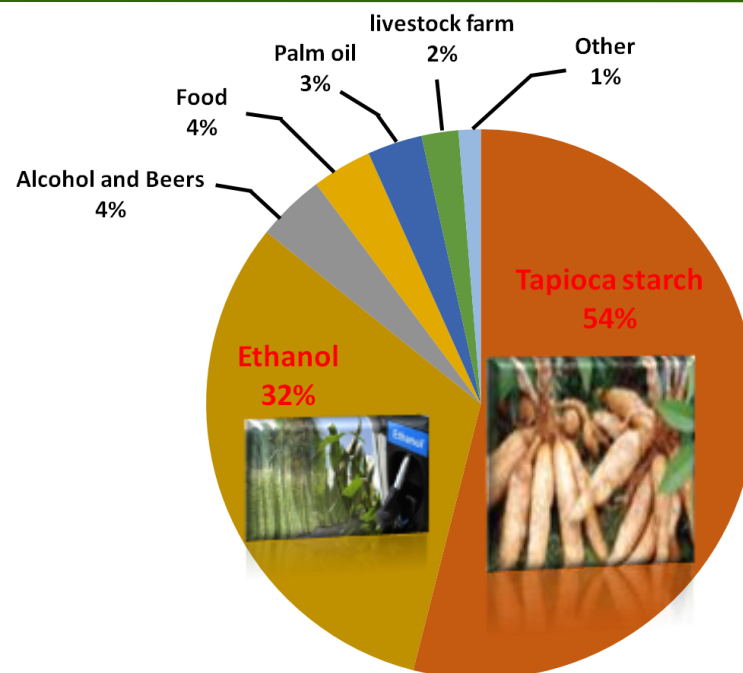
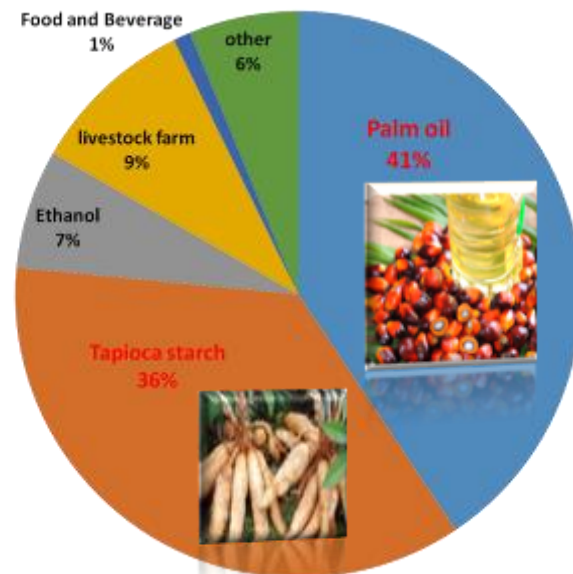
Item	Target in 2021	Performance (Jan – Dec 2014)
Electricity (MW)	3,600	311.50
Heat (ktoe)	1,000	488.08
CBG (ton/day)	1,200	-

SOURCE from DEDE : Performance on Alternative Energy Policy: Jan –Dec 2014 * As of 15 Feb 2015

Electricity

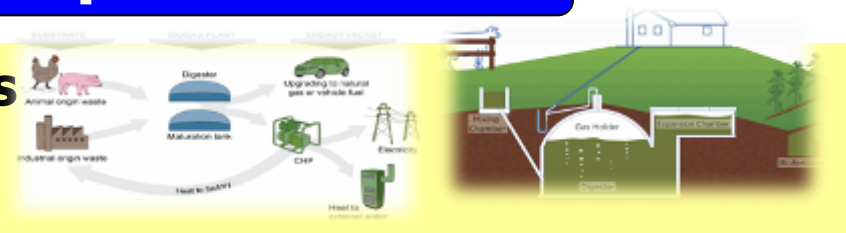
Type of industry

Heat



Biogas Development

Development guidelines on biogas



- ## 1. Promoting communities to collaborate to broaden production and consumption of renewable energy

- ❖ Household level, especially rural communities
- ❖ Biogas network

- ## 2. Adjusting incentive measures for investment from private sector appropriate to the situation

- ## ❖ Biogas for Compressed Bio-Methane Gas(CBG) production

- ### 3. Amending laws and regulations which do not benefit renewable energy development

- ## ❖ Biogas safety standard

- #### 4. Public Relations and building up comprehensive knowledge among people

- ❖ **Conduct public relations via media to disseminate knowledge and news “Biogas Safety Campaign”**

- ## 5. Promoting research work as mechanism in development of integrated renewable energy industry

- ❖ **Mixed wastes (Co-Digestion)**
- ❖ **CBG for transportation**

Conclusion

- AEDP can't solve all energy problems but is able to :

- Reduce use of natural gas and other fossil fuels.
- Help energy security in the country.
- Distribute power generation in areas which the transmission line can't access.
- Environmentally friendly, and
- Sustainable energy development in the country.





Thank you for Your attention

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