

Food ~ Energy ~ Water



Selected Data & Energy Resources

Population in 2010 : 240 million people
(4th world rank)

Population growth : 1.5 % per annum

➤ 60% live at Java island

Land area : 1.9 million km²

Sea surface area : 5.8 million km²

West – east : 5,150 km length

North - south : 1,930 km wide

Coastline : 95,180 km

Archipelago : 17,500 island

: 22,000 rivers

Season : rain & dry

Wind from : west or east

Electrification ratio : 65%

Energy Resources fossil based :
(limited reserve)

➤ Petroleum : \pm 25 years

➤ Natural Gas : \pm 55 years

➤ Coal : \pm 100 years

Renewable Energy resources :

➤ Geothermal : biggest of the world

➤ Hydro

➤ Solar radiation (all the year)

➤ **Ocean energy** :

(wind, wave, tidal, sea current)

➤ BioFuel & BioGas

Indonesian Natural Energy Resources

No	RENEWABLE ENERGY	NATURAL RESOURCE	INSTALLED CAPACITY	RATIO (%)
1	2	3	4	5 = 4/3
1	Hydro Power	75.670 MW	4.200 MW	5,55
2	Geothermal	28.53 GW	1.189 MW	4,2
3	Mini/Micro Hydro	500 MW	86,1 MW	17,56
4	Biomass	49.810 MW	445 MW	0,89
5	Solar Power	4,80 kWh/m ² /hari	14,1 MW	-
6	Wind Energy	3 – 6 m/s	1,4 MW	0,015

No	FOSSIL ENERGY	RESOURCE	RESERVE	RATIO (%)	PRODUCTION	RATIO Resv/Prod (YEAR)
1	2	3	4	5 = 4/3	6	7 = 4/6
1	Petroleum (billion barrel)	56,6	7,99 **)	14	0,346	23
2	Natural Gas (TSCF)	334,5	159,64	51	2,9	55
3	Coal (billion Ton)	104,8	20,98	18	0,254	83
4	Coal Bed Methane (TSCF)	453	-	-	-	-

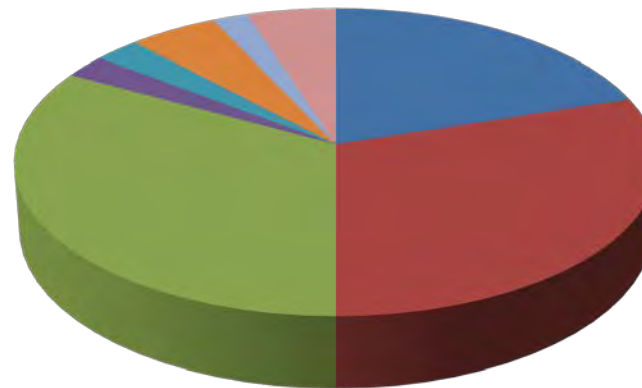
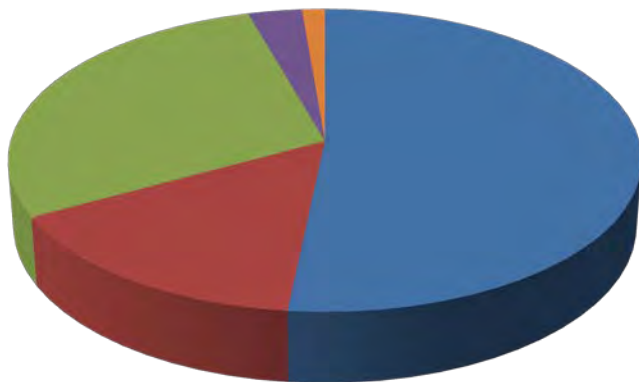
→ Currently Indonesia imported around 400,000 barrel Petroleum per day of total national consumption approx. 1,500,000 barrel per day

Source : ESDM

Energy Mix Target

Oil	51.66%	20.0%
Coal	15.34%	30.0%
Natural Gas	28.57%	33.0%
Hydro power	3.11%	2.4%
Renewable energy	-	2.6%
Geothermal	1.32%	5.0%
Coal Liquefaction	-	2.0%
Biofuel	-	5.0%

2006 → 2025

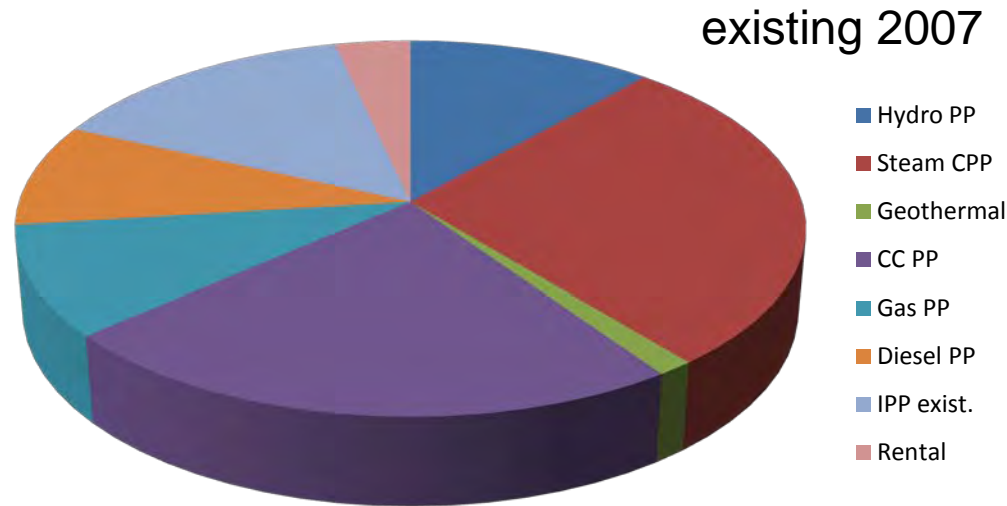


- Oil
- Coal
- Natural Gas
- Hydro power
- Renewable Energy
- Geothermal
- Coal Liquefaction
- Biofuel

Source : ESDM

PLN's Power Generation Development

(PLN : Electricity state-owned company of Indonesia)



IPP's plan 2011 :

- Hydro PP : 425.4 MW
- Steam CPP : 2,896 MW
- Geothermal : 95 MW
- CCPP : 60 MW
- Gas PP : 27.5 MW

PLN & IPP jointly 2012 :

Steam Coal PP : 9.871 MW

PLN & IPP jointly 2014 :

- Hydro PP : 300 MW
- Steam CPP : 7,644 MW
- Geothermal : 2,135 MW
- CCPP : 1,090 MW

PLN's projection 2019 :

to be built new : 55.500 MW

Energy Storage & Value added

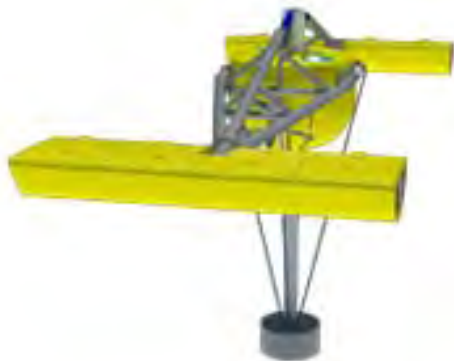
Yanbaru, Okinawa



Sea water pumped storage



Hydraulic Pump unit



Ocean Treader (floating)

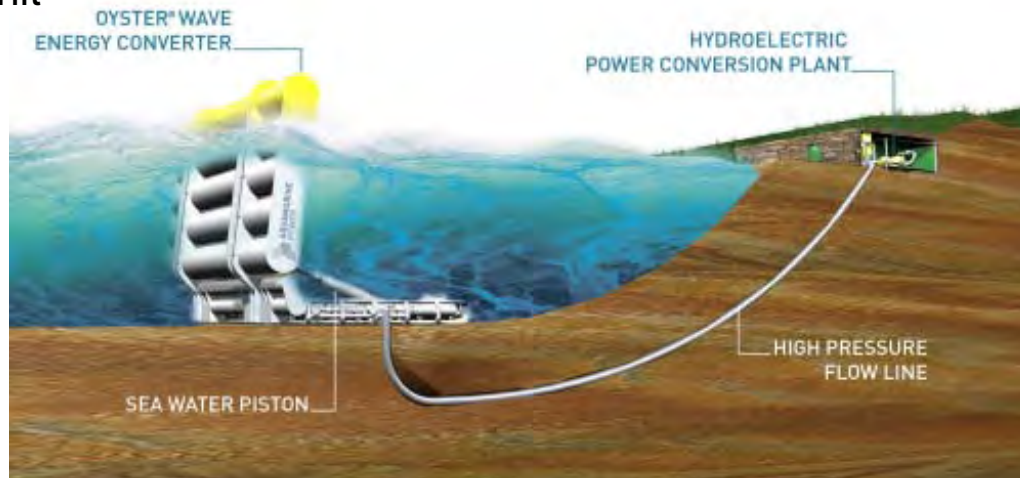
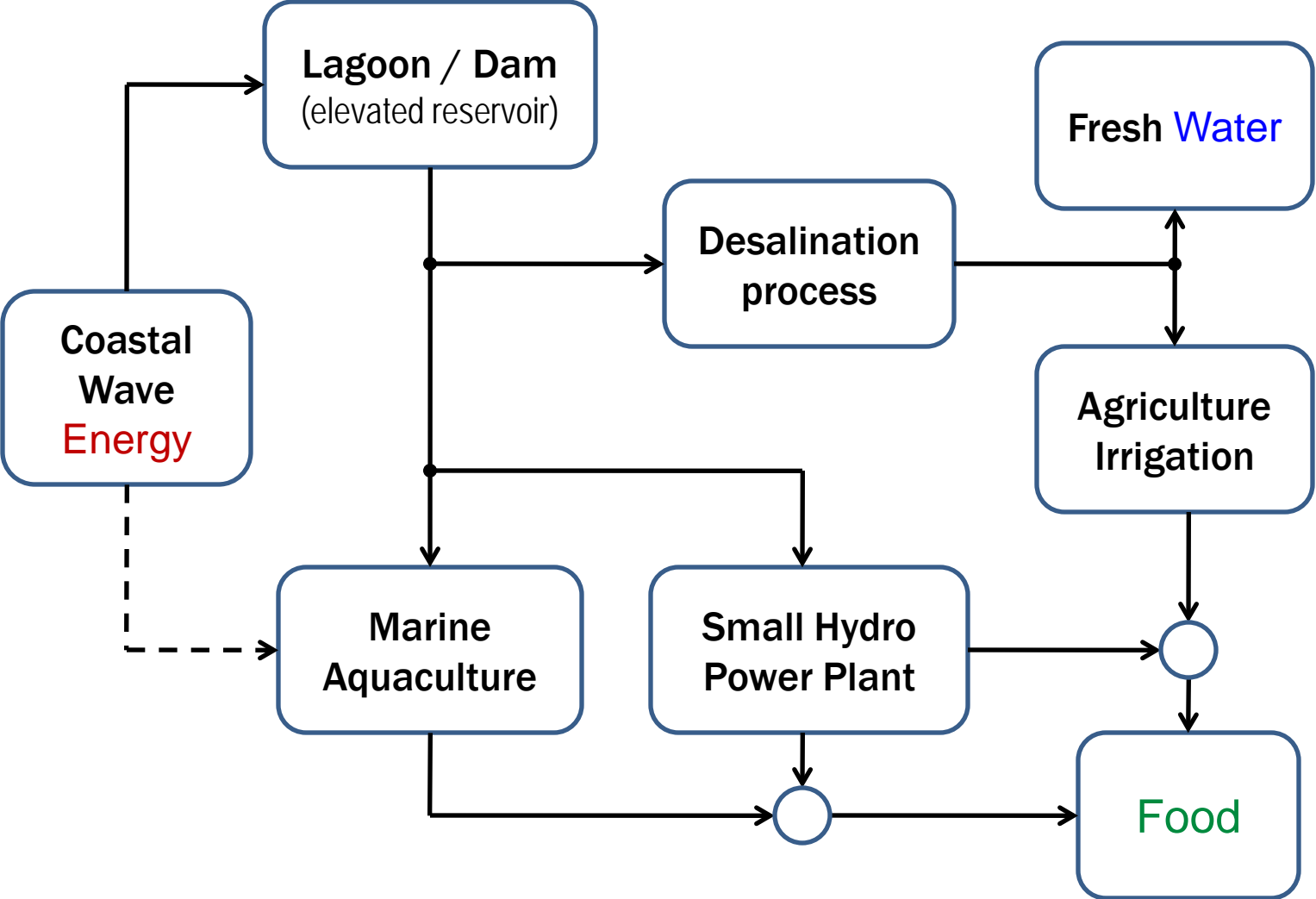
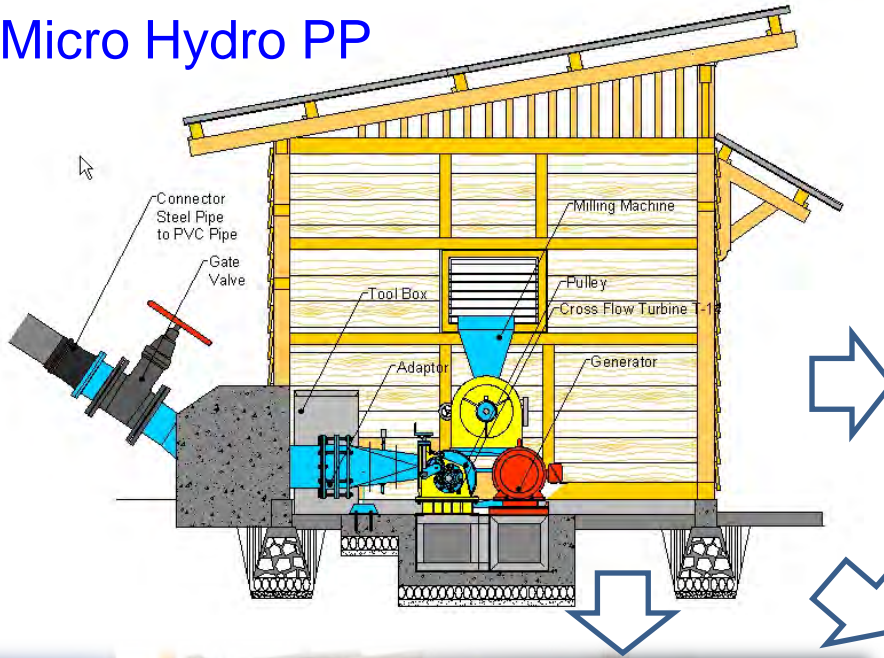


Diagram of Value added Development



Electricity for Productive Economy

Micro Hydro PP



Home Industry

Mutual Benefit Cooperation

Japan's organization

&

Indonesia's organization

Lagoon / Dam :

- Design & Engineering
- Technical assistance
- Materials supply (FRP)

Small Hydro Power Plant :

- Design & Engineering
- Construction team
- Site Management

Wave Energy converter :

- Design & Engineering
- Technical assistance
- Equipment supply

Desalination process :

- Design & Engineering
- Installation team
- Site Management

Financial for :

- All equipment
- Japan's team personnel
- Project Management

Marine aquaculture :

- Fishery cooperation locally
- Training & Mentoring
- Site Management

Multiplier Effects

Global Warming Mitigation

CO₂ Emission Reduction

Coastline protection

Renewable Energy utilization

Security of Energy supply

Replace high cost Fossil Fuel

Society empowerment

Increase the harvesting cycle

Productive Economy development

Replicate to other location / region



Arigatou gozaimasu

djokobudi@gmail.com

Kenichi Horie & Suntory Mermaid II



Hawai – Japan : March ~ July 2008