

Indonesia Solar Power Mapping Study using Secondary Data

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The objective of the study

- To determine the theoretical potential of solar irradiation in Indonesia by several approximation from global up to regional point of view to investigate the favorable places of the potential solar radiation to convert in the electricity power .
- This global point of view may be subjected to have global findings of the specific areas favorable for obtaining the solar energy conversion for electricity.
- From the regional point of view:
 - the development of timing of the sun shining may derive from rainfall pattern, where the more rainfall received over certain areas.
 - they may describe more cloud development to reduce sun shining as well as sun radiation.
 - The result may give more detail the potential areas of the sun radiation to be converted into solar power for electricity.

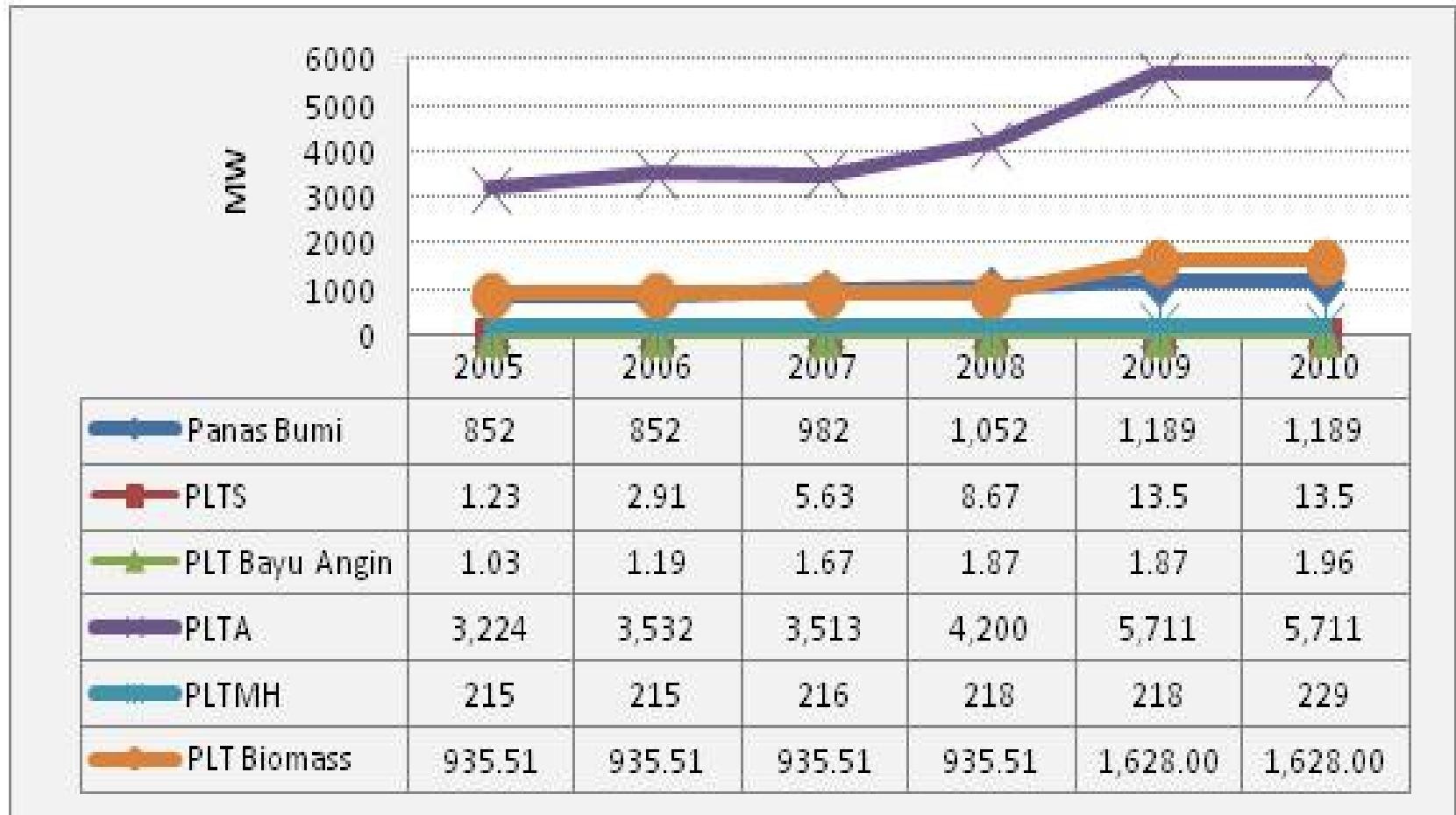
Introduction

- The solar energy amount received from the sun radiation to the basketball field size a year is equivalent to about 650 barrels of oil a year [4] .
- The Earth receives 174 million Giga-watts of incoming solar radiation power at the upper atmosphere [2].
 - Approximately 30% is reflected back to space while the rest is absorbed by clouds, oceans and land masses.
 - Sunlight absorbed by the oceans and land masses keeps the surface at an average temperature of 14 °C.
- The total solar energy absorbed by Earth is approximately 3,850,000 exajoules (EJ) or equal with a factor of 10^{18} joules per year [2].
- Photosynthesis captures approximately 3,000 EJ per year in biomass.
- The amount of solar energy reaching the surface of the planet in one year is about twice as much the amount obtained from all of the Earth's non-renewable resources of coal, oil, natural gas, and mined uranium combined

Solar Energy-Electricity Conversion

- The direct method is conducted through Solar Panels or Photo Voltaic (PV) arrangement. Such a panels are made from silicon PV cells that works principle is similar to the chlorophyll function in organisms.
- Indirect methods method is undertaken by using lenses or mirrors to concentrate sunlight and generate heat that is used to boil fluid for a conventional power plant.
- To improve efficiency, it can be combined with solar panel system.

Indonesia Renewable Energy Development (2005 – 2010)



Cited from Blueprint Pengelolaan Energi Nasional 2006-2025

The picture of renewable energy in Indonesia

Energy	Installed capacity (2011), GW []	Projected in 2025, GW []	Potential energy []
Geothermal	1.200	9.500	29 GW
wind	0.003	0.970	3-5 m/s (>9.3 GW)
Solar	0.025	0.870	4.8 kWh/m ² /day (>1000 GW)
Biomass	0.500	0.810	49.8 GW
Hydro	4.200	12.800 []	75.7 GW
Mini / micro hydro	0.020	2.846	230.9 GW []
Ocean []	0.001	0.050	>727 GW []
Bio-diesel []		Annual growth 3%	
Bio-ethanol		Annual growth 3%	

Cited from Blueprint Pengelolaan Energi Nasional 2006-2025

Projection of Energy mix without nuclear in 2025 (Revision the Presidential Decree no.5 of 2006 by Government)

