

FOR SOLAR AND WIND

This is with regards on your query for the typical efficiency, service life, payback period and GHG emissions of Solar and Wind Power Plants in the Philippines.

1. For the typical efficiency, this is based on the Performance Efficiency of the operating power plants and, based on our records, the estimated average for the Performance Efficiencies of Solar and Wind Power Plants ranged between 16-20%.
2. The service life of the power plants, specifically for Solar and Wind plants, are within 20 - 25 years and its payback period are usually 7 to 10 years.
4. Solar and Wind Power Projects did not emits greenhouse gases. Among the four, only biomass emits greenhouse gases although in energy GHG inventory, only methane (CH₄) and nitrous oxide (N₂O) are included in the total computation of GHG emissions. Carbon dioxide (CO₂) emissions from biomass combustion are not included in national totals but are recorded as a memo item for cross checking purposes. Emission factors for the different types of biomass used in energy industries are available from the IPCC 2006 Guidelines for National Greenhouse Gas Inventory, Volume 2 - Energy.

If you will be computing for the GHG avoidance from RE in power generation, you can compute for it by first coming up with an estimate of your (annual/life cycle) generation and multiplying it with the National Grid Emission Factor (NGEF) for Luzon-Visayas or Mindanao depending on your plant's location.

Please refer to the following links for additional information:

https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf

https://www.ipcc.ch/site/assets/uploads/2018/03/SRREN_FD_SPM_final-1.pdf

<https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>

<http://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef>

FOR HYDROPOWER PLANTS

Efficiency	:	47% (Plant Factor)
Service Life	:	~50 years
Payback period	:	Average of 7 years
Global median GHG emission	:	18.5 gCO ₂ -eq/kWh (Reservoir Type)*

*Source: <https://www.hydropower.org/news/study-shows-hydropower%E2%80%99s-carbon-footprint>

FOR BIOMASS

1. The Typical Efficiency of Biomass Power Plants:
 - Cogeneration – 60%
 - Stand-alone plant – 90%
2. Service Life and Payback Period of Biomass Power Plants.
 - Service life - 20 years (minimum).
 - Payback period – 7 years (minimum)
3. GHG Emissions

Please refer to the links for your reference.

- https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf
- https://www.ipcc.ch/site/assets/uploads/2018/03/SRREN_FD_SPM_final-1.pdf
- <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>
- <http://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef>