MINDANAO Regional Scientific Meeting

"Science and Technology- Enhanced Transformation for Sustainability and Resiliency (2018-2030)"

TOPIC 3 – ENERGY

Energy Security, Sustainability and Resiliency

- Renewable energy is an essential part of Philippine's low emissions development strategy and is vital to addressing the challenges of Climate Change (SD3), Energy Security (SD1), and Access to Energy (SD2).
- Development and Optimal Use of the Country's Renewable Energy is central to the Philippine's Sustainable Energy Agenda

Power Generation by Source (Gwh, Total Philippines)

	2005	2010	2015	2016	% Share
Coal	15,257	23,301	36,686	43,303	47.7
Oil-Based	6,141	7,101	5,886	5,661	6.2
Natural Gas	16,861	19,518	18,878	19,854	21.9
Renewable Energy	**18,308**	**17,823**	**20,963**	**21,979**	**24.2**
Geothermal	9,902	9,929	11,044	11,070	12.2
Hydro	8,387	7,803	8,665	8,111	8.9
Biomass	0	27	376	726	0.8
Solar	**2**	**1**	**139**	**1,097**	**1.2**
Wind	17	62	748	975	1.1
Total	56,568	67,743	82,413	90,798	100

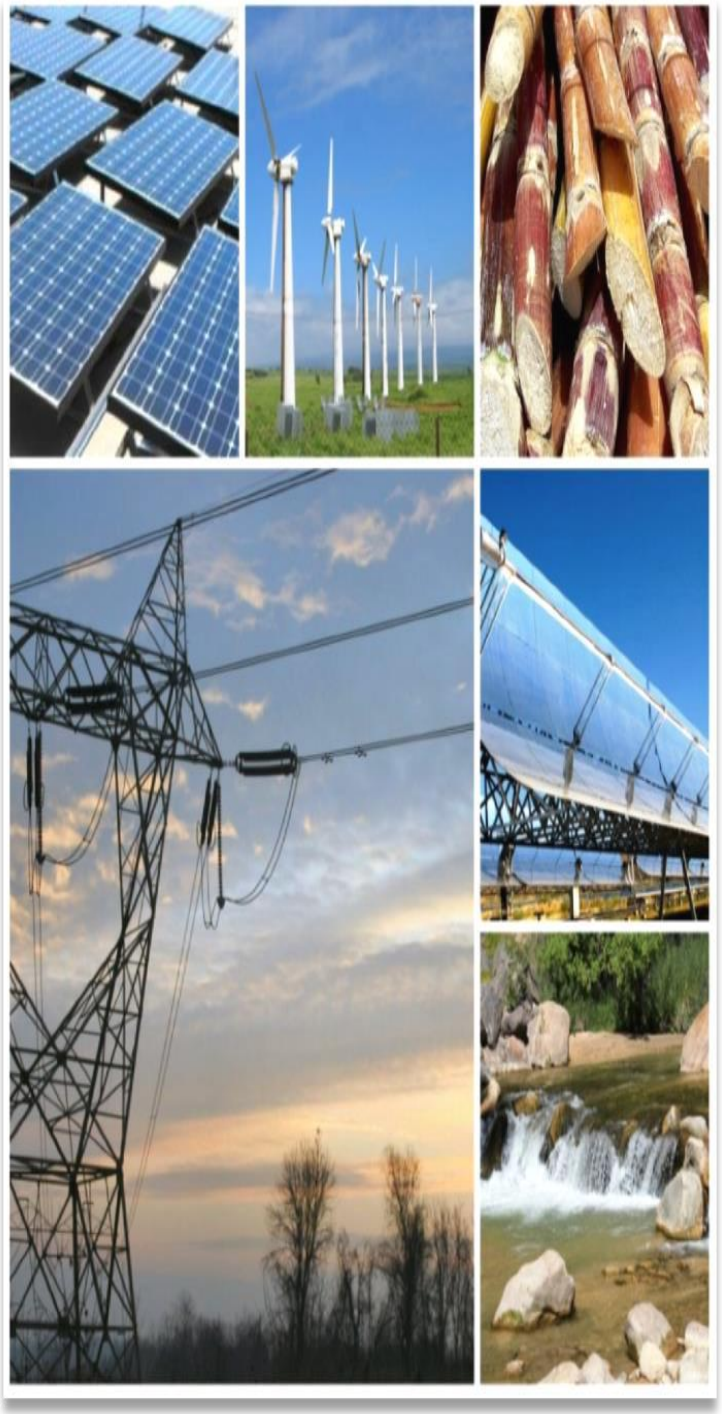
Source: 2016 Power Statistics, DOE

Strategic Directions 2017 – 2040

3 PROMOTE A LOW CARBON FUTURE

- Increase RE Capacity by 2030 (based on 2010 level)
- Promote technology innovation through research, development, demonstration and deployment
  * Clean, efficient and smart energy technologies

Source: Posadas (2017)



The PV System

- PV Systems currently contribute about 1 % to world wide electricity generation;
- The International Energy Agency (IEA) expects solar power to become the world's largest source of electricity by 2050, with solar photovoltaics and concentrated solar thermal contributing 16 % and 11% to the global demands, respectively (IEA 2014).

- Energy Conversion efficiency of a conventional solar module increased from 15 % to 20 % over the last 10 years (ISE 2018)

- Identifying and Reacting to manageable losses is critical for Revenues and Efficiency

Performance of Solar PV (Research Areas)

- Silicon ingot (Mono-crystalline, Poly-crystalline, Amorphous)
- Cell fabrication (Precision and configuration)
- PV panel assembly (cover glass film/sheet (thickness and type of materials)
- Availability of sunlight (there is a need to consider availability of sunlight vis-a-vis type of solar-PV panels, inverter and other materials
- Balance of System (Charge-Controller, Inverter, Transformer used, etc.)

“*There are jobs, money and survival in renewable energy. Our only safe future is sun power*.”

Dave Hampton (Letter to The Sun Newspaper, May 2006)

References

DOE. 2016. 2016 Power Statistics. Department of Energy.

IEA. 2014. Technology Roadmap: Solar Photovoltaic Energy. International Energy Agency; Paris, France.

ISE. 2018. Photovoltaics Report. Fraunhofer Institute for Solar Energy Systems. Freiburg, Germany.

Posadas, J. C. 2017. Philippine Energy Plan 2017-2040. ACD Conference towards Energy Security, Sustainability and Resiliency, 8 August 2017 at Be Grand Hotel, Panglao,