



MARIANO MARCOS STATE UNIVERSITY

Divestment From Carbon-Intensive Energy Industries

The University is slowly divesting from carbon-intensive energy and investing more on renewable clean energy. As a policy included in the Energy Power Generation and Utilization Policy of the University, all buildings new and existing must be renewable energy ready. The Department of Energy selected the MMSU as one to be Net-Zero Energy recipient. The NBERIC building is mentioned to be the model for Net-Zero Energy Building (NZEB) [\(4\) NEWS | DOE TO MAKE MMSU AS NET... - Mariano Marcos State University | Facebook](#).

Mariano Marcos State University is harnessing 3 sources of renewable energy - bioethanol, solar and wind. Solar power has been utilized for a variety of applications (i.e. solar powered irrigation pumps, solar-powered lights, solar PV generators). The breakdown of which are as follows:

Setup	Total Capacity (kWp)	Location	Storage (kWh)
Solar Pump DA	5	MMSU Cares, Batac	
Solar Pump DA	3	MMSU Cares, Batac	
Solar Pump DA	3	MMSU Cares, Batac	
Solar Pump NBERIC	1	Admin, Batac	
Solar Pump NBERIC	1	Admin, Batac	
Solar Pump NBERIC	1	Admin, Batac	
Solar Pump NBERIC	1	Admin, Batac	
Solar Pump NBERIC	1	CAFSD, Batac	
Solar Pump NBERIC	1	CAFSD, Batac	
Solar Pump NBERIC	1	CAFSD, Batac	
Solar Pump CAFSD	1.1	CAFSD, Dingras	
Hybrid Offgrid	5	Nagbacsan Piggery, Batac	9.60
Hybrid On/Offgrid	10	NBERIC Old, Batac	38.40
Hybrid On/Offgrid	10	NBERIC New, Batac	38.40
Hybrid Offgrid	3	NBERIC New, Batac	2.40
Offgrid	1	NBERIC New, Batac	2.40
Grid-tie	40	NBERIC New, Batac	
Hybrid On/Offgrid	15	NBERIC AREC, Batac	30.72
Grid-tie	20	COM, Batac	
Grid-tie	20	CTE, Laoag	
Hybrid On/Offgrid	6.37	CASAT, Currimao	19.20
Grid-tie	4.55	CASAT, Currimao	
MMSU Street Lights Old	0.05	Batac Campus	
MMSU Street Lights New	0.09	Batac Campus	
MMSU Street Lights New	0.1	Batac Campus	
Windmill HAWT	0.5	NBERIC Old, Batac	
Windmill Water Pumping	1	Nagbacsan, Batac	

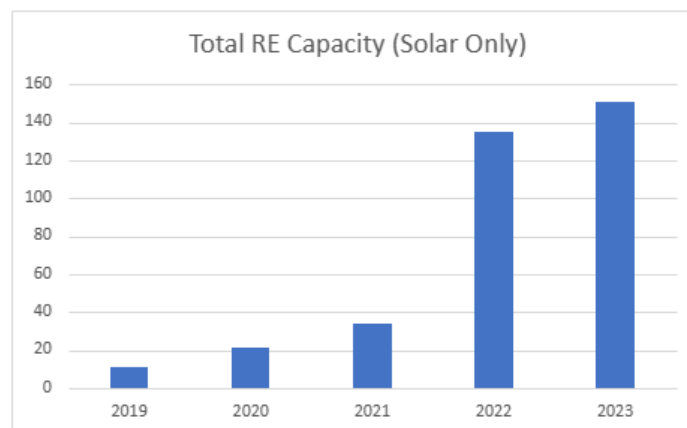


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On the other hand, through the National BioEnergy Research and Innovation Center, the university formulates 95% Bioethanol from Nipa sap. The produced ethanol gets blended with clean gasoline at 20% blending to be used for university vehicles, motorcycles, and brush cutters running in spark-ignition engines.

No.	Renewable Energy	Production (kWh)
1	Solar	225,219.6
2	Wind	3,942
3	Bioethanol	28,800
	TOTAL	257,961.60

Also, the investment to renewable energy is evident based on the capacity that the university is producing from 2019 to 2023. From a meager 11KW to 151KW shows an upward trend that the university is committed to be a model for NZEB.



Example of Solar roof-top PV installation at NBERIC Building





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Example of a Wind-powered water pump used by DA-ATI inside the MMSU-Batac Campus



Example of a Residential Wind Turbine at Old NBERIC Laboratory



Example of Floatovoltaic Grid tie setup at MMSU Currimao Campus



Example of Solar-powered Irrigation Systems



Example of Gasoline blended with MMSU Hydrous Ethanol for use of university vehicles

