

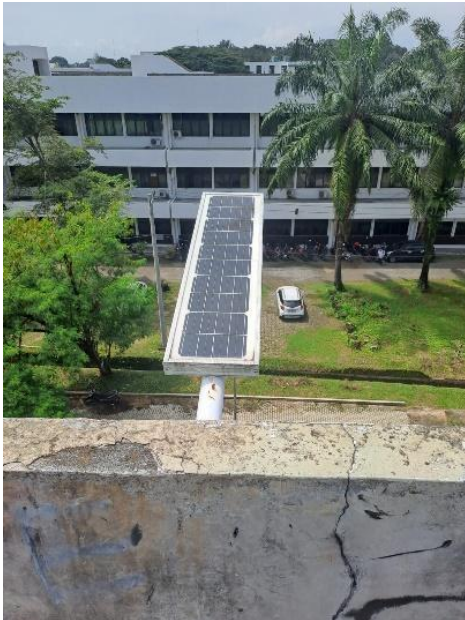


Template for Evidence(s) UI GreenMetric Questionnaire

University : Universitas Sumatera Utara
Country : Indonesia
Web Address : www.usu.ac.id

[2] Energy and Climate Change (EC)

[2.8] ratio of renewable energy production divided by total energy usage per year





Solar Panel found in the Main Administration Building, Solar panel in Faculty of Engineering integrated Lab ,Class Room, Solar-powered lights and charging ini student hall, and Solar-powered lights along at Universitas Street and Solar charging at shuttle bus



Wind Turbine

Water Turbine

Biomass Pyrolysis

Description:

USU has three sources of renewable energy produced on campus. They are: Biogas power plant (10 kW), Solar panels found in the Main Administration Building (21 kWp capacity), Mechanical Engineering Laboratory (3 kWp capacity), Biomass , Wind Turbine (36 kWh capacity), Water turbine (210.96 kWh capacity), Solar-powered lights along at Universitas Street (13.5 kWp capacity, Bus Shelter (0.3 kWh capacity), Student Pavilion (2.55 kWh capacity).

No	Renewable Energy	Production (kWh/year)
1	Solar Panel	14,627
2	Wind Turbine	36
3	Water Turbine	210.96
4	Biomass	-
	Total	14873.76

Note:

Electricity usage per year= 803,081 kWh



1. Solar Panel

Peak/day = 4 hour (solar radiation)

1 year = 360 days (5 day for maintenance time)

Total solar energy production per year = 14,627 kWh

2. Wind Turbine

Average rate flow = 2 m/s

Power = 1 watt/h (10 hours/day)

1 year = 360 days

Total wind energy production per year = 36 kWh

3. Water Turbine

Power = 586 watt/h

1 year = 360 days (1 hours/day)

Total water energy production per year = 210.96 kWh

Total renewable energy production per year = 14,873.76 kWh

Ratio = (Total renewable energy production per year/ Electricity usage per year) x 100%

= (14,873.76 kWh/ 803,081 kWh) x 100%

= 1.85%