



CENTRE FOR  
SUSTAINABLE ENERGY &  
RESOURCES MANAGEMENT

# Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar

Version 3

**Project 4: Marine Renewable Energy**

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**Produced in collaboration with Aquatera Ltd.**

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## EXECUTIVE SUMMARY

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Based on the results of the resource assessment and site investigation that has been undertaken, it is feasible that, the potential of wind, solar, and biomass in Selayar Regency can be converted into electricity. The potential for tidal energy needs to be further investigated given the limited data obtained during fieldwork and the limited access to locations that have been identified as having potential tidal energy. The potential of solar energy is spread evenly across the Islands with higher intensity in the north and south of the Island of Selayar and on Tabolongan and Polasi Islands where the land is relatively flat and not covered by highlands. The potential of wind power is located at the top of the plateau on the east side of Selayar Island and the north and south sides of Selayar Island. These areas are relatively flat where the reaction is directly affected by the west and east winds. The north side of Selayar Island is very suitable for the development of wind farms where grid connections already exist, there is extensive land available, and good transportation routes. The potential of biomass from agriculture and ocean waste is also spread throughout the Kabupaten Kepulauan Selayar region with a production capacity of 125 tons per day equivalent to 131 MWh of electricity per day.

The development of the Renewable Energy sector will certainly be very beneficial for the Island to reduce dependence on fossil fuels, especially diesel which is currently the main fuel for electricity generation. To step into the exploitation stage of the potential of renewable energy, long-term resource assessments are required to find out more details about the potential of renewable energy. The Selayar Regional Government are encouraged to promote the potential of renewable energy in its area to related parties such as the central government, potential investors, and PLN so that the potential of renewable energy can be developed immediately. A long-term business model is essential and should be prepared to ensure the sustainability of renewable energy development projects given the size of the investment and the high electricity demand of the local community. A sustainable business model must also be applied to existing renewable energy power generation facilities such as PLTS and PLTMh which are not functioning properly so that these facilities can be revitalised. Considering the range of services, experience and technical capabilities available, it is highly recommended to involve PLN in the operation and maintenance activities of the renewable energy facilities. PLN's plan to build a PLTG will certainly be very useful to increase energy security and reduce the carbon emissions that have been produced by the PLTD.

Selayar Islands Regency has much diverse tourism potential that can be developed into eco-tourism. There is undoubtedly a market for this. The increasing popularity of green tourism can also be combined with the development of renewable energy on this Island by providing electricity from renewable energy to meet electricity needs in tourist facilities such as resorts and hotels. In general, the development of renewable energy on the Island of Selayar will provide a significant positive impact on energy reliability, tourism, socio-economic activities, and the environment.



## 1. INTRODUCTION

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Data from the National Electric Company (PLN) states that there is one diesel power plant (PLTD) with a capacity of 10 MW located in Tangkala that supplies electricity on Selayar Island. The peak load on Selayar Island is currently 5.5 MW with annual growth of around 0.2 MW. According to the Local Investment Coordinating Board (BNPM), this year PLN plan to build a gas power plant (PLTG) with a capacity of 20 MW in a location adjacent to the PLTD site (Firman, 2018). Data from Statistics Indonesia (BPS) shows that in 2017, the electrification ratio in Kabupaten Selayar was 65.73% (Selayar, 2018).

PLN Selayar Branch also manages village electricity in Pasimasunggu District with an installed power of 2 x 100 kW and procurement of generators in four other Island sub-districts with a capacity of 100 kW each. In 2006-2011, a solar power plant (PLTS) was built to meet the electricity needs of the Islands. This incorporates as many as 2,689 PLTS dispersed units, construction of a centralized PLTS unit with a capacity of 5 kW in Dusun Bajo Kayuadi Taka Bonerate sub-district and installation of 1 PLT package Solar-Wind Hibryd with a capacity of 20 kW in Appatanah Village, Bontosikuyu District.

In 2008, the construction of two x 100 kW capacity wind power plant (PLTB) in Barubasa, Pamatata Village, Bontomatene sub-district. However, to date, the PLTB has not functioned. In the same year, a 5 kW capacity Hydroelectric Power Plant (Pico Hydro) was constructed in Jammeng Timoro, Laiyolo Baru Village, Bontosikuyu District (HL, 2012).

In 2003, there were 840 electricity poles that were spread over three main sub-districts, namely Bontomatene District (243 poles), Bontoharu District (157 poles) and Bontosikuyu District (440 poles). This programme is funded by the Selayar Islands Regency Government through the Regional Budget (APBD). In 2008, the construction of a 12.7 km medium voltage network / low voltage network (JTM / JTR) was conducted in Bontomatene District (from West Lambongan Village to Bungaiya Village). In 2010, the construction of a 17.8 km JTM / JTR electricity network in four villages in Bontosikuyu District, namely Laiyolo Village, Binanga Sombaiya Village, Lantibongan Village, and Lowa Village.

In 2009, there were 1,789 poles (81.635 km long) in the mainland district of Selayar Regency which were also funded by the Regional Budget. In 2010, the construction of a 48.14 km JTM / JTR electricity network was implemented. According to the website of the Ministry of Energy and Mineral Resources, the national Basic production price (BPP) is US \$ 15.26 cent per kWh while the Selayar Islands BPP is US \$ 7.86 cent per kWh. This is of interest for independent power producers (IPP) in terms of investment in power plant concentration in Selayar (ESDM, 2017).

According to the report of the office of the Selayar Regent, the total fuel consumption in 2018 was 13,105 kiloliters with average monthly consumption of 1,092 kiloliters consisting of 9,184 kiloliters of gasoline, 3,783 kiloliters of diesel, and 138 kiloliters of pertalite. The calculation of the amount of fuel consumption is based on the report on fuel unloading at Benteng port. The fuel supply on Selayar Island is mainly supplied by four gas stations spread around the city of Benteng. In areas outside the city of Benteng, there are many small shops that sell fuel. According to observations carried out during field work and interviews with the local community, gas stations do not serve fuel sales throughout the day due to lack of supply, only at certain hours which results in long queues much of the time. At the small fuel retailer level, fuel supply is relatively more stable with prices around 25% more expensive than at gas stations.

## 2. METHODOLOGY

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Secondary data collection is done by collecting data through Aquatera's RADMAPP tool, global solar atlas, and global wind atlas prior to fieldwork. Secondary data is used for the initial reference for determining the location of the resource assessment and determining the comparative value for the data measured in the field. Sites that have been identified from secondary data will be confirmed with the local community or related government bodies such as Agency for Regional Development (BAPPEDA), Investment Coordinating Board (BKPM), and Industry and Trade Office (Disperindag). This will provide input on detailed information about the location, research and work that has been done before, and data of other sites that have renewable energy potential. For example, information about tidal flows can be asked to local fishers and port officials, and information about wind potential can be requested from airport officials and residents. Weather data from the nearest weather station, airport, or port is also beneficial as a comparison of primary data. Primary data was obtained by conducting resource measurements at specific sites determined from secondary data using specific equipment.

Solar resource assessment was carried out by measuring solar irradiance in several locations. Measurements were made from 8:00 am until around 4:00 pm with two minutes interval using Lutron SPM which works in a spectrum of 400 to 1100 nm. This tool is equipped with a real-time recorder that saves data into the SD memory card and can be downloaded to the Excel format. The sensor was installed in an open location that is not blocked by shadows during the measurement time with a zero-tilt angle. The measurement was conducted at Benteng port, fishers market port (TPI), Lapangan Pemuda, Shafira hotel roof top, Tabalongan Strait, and Padang Strait.

Wind data was obtained by measuring the wind velocity and direction at two locations, namely at Puncak Tanadoang on the east side of Benteng City and at Bontomatene village, located at the north of Selayar Island where two 100 kW wind turbines were built in 2008. The selection of this location is based on data from RADMAPP and interviews with residents regarding windy areas on Selayar Island. Measurements are carried out using Flow Watch JDC FL-03, which is a portable flow / flow measuring instrument, designed for simple and accurate measurements for air and water flow. This tool does not have a self-recording feature, so manual recording must be done at the specified time interval. Measurements were made by installing a sensor on a 3-metre-long bamboo pole placed in an open place so that trees or buildings do not block the wind. Data measurements were carried out for 5 hours at the first location and three hours at the second location at 10 minutes intervals.

Measuring the potential of ocean currents was done by measuring the speed and direction of ocean current using Flow Watch JDC FL-03, a portable flow or flow measuring instrument, designed for simple and accurate measurements for wind and water flow. The measurement was conducted at two locations: west side of the Selayar Island, between Padang village and Pasigusung Island and in the Strait between Polasi and Tambolongan Islands. Based on the data obtained from RADMAPP, there were 4 locations identified as having strong currents. Unfortunately, these four locations were difficult to reach with available vessels because of their site too far from the shoreline and bad weather conditions. Considering safety factors, two other areas were selected based on interviews conducted with local fishers. Tidal observations were carried out at Benteng port by using Valeport TideMaster, which was installed for 12 days from 17-29 June 2019 with data intervals every 10 minutes. The Tide Master is a small, cost-effective Water Level Recorder, specially designed for applications where the user requires an accurate record of water height with selfrecording features. The installation location was chosen by considering the safety, and water conditions where tidal levels are not disturbed by natural conditions and structures at the observation location.





Figure 1. Tide gauge installation at Benteng port

Site characterisation is carried out by collecting supporting data such as grid connections, existing power generation, service development plans from PLN, the amount of electricity demand, and peak loads and observations in the field. This supporting data is obtained by conducting visits to the PLN office, BAPPEDA, BKPM, on-site observation, and interviews with the community and the village leader.



# 3. RESULTS

## 3.1 Solar

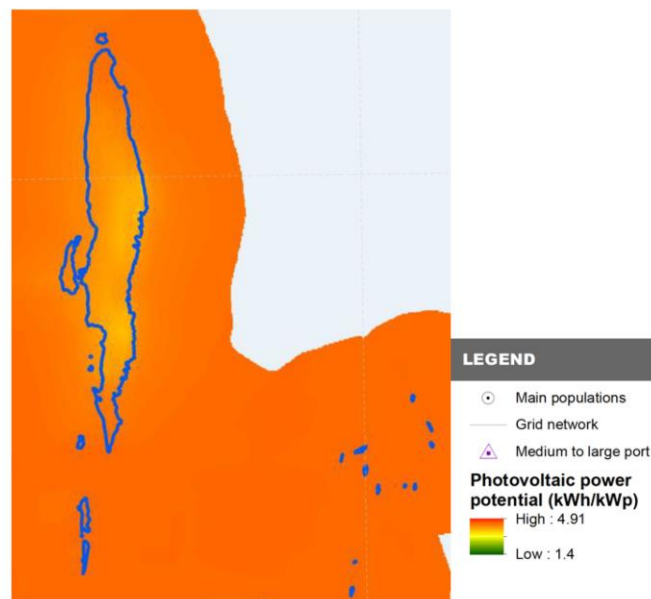
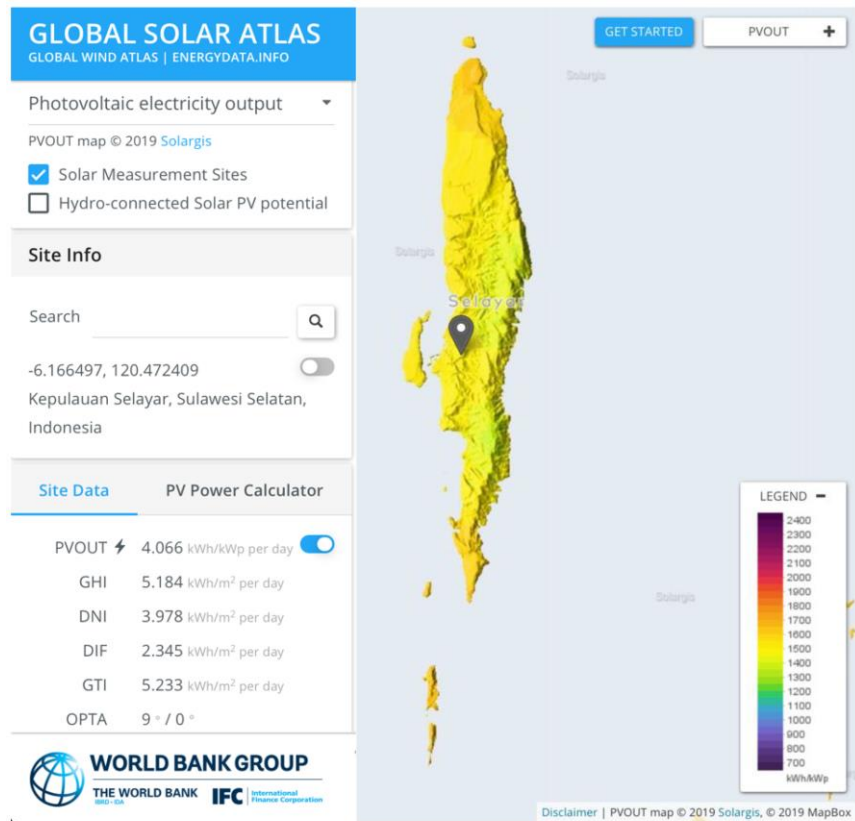


Figure 2. Secondary data from Global Solar Atlas (top) and RADMAP (bottom)



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As can be seen in Figure 2, the south and north site of the Selayar Island has higher solar potential, as well as at Tambolongan and Polasi Island. In those areas, the terrain is relatively flat and is in the lowlands, compared to the central eastern side of the Island which is hilly and highland. The hilly area is relatively cloudier and in the afternoon the sun is blocked by a hill on the east side of the Island which causes low sun exposure.

Table 1. Daily irradiation measured at sites

Date	Daily average (W/m <sup>2</sup> )	Maximum (W/m <sup>2</sup> )	Location
18-Jun	835.7	1,024	Benteng Port
19-Jun	599.8	1,169	Fish market port
20-Jun	822.5	937.7	Lapangan Pemuda
21-Jun	752.3	1,090	Appatana
22-Jun	799.6	897.9	Tabalongan Strait
24-Jun	748.4	941.3	Padang Strait
26-Jun	747.5	941.3	Syafira Hotel Rooftop
27-Jun	692.1	1,075	Syafira Hotel Rooftop
28-Jun	687.3	1,034	Syafira Hotel Rooftop
<b>Average</b>	<b>742,8</b>		

The measurement data shows that the daily average solar irradiance is taken over 9 days during the field work is 742.8 W/m<sup>2</sup> with maximum irradiation of 1,169 W/m<sup>2</sup>. The solar irradiance at the location is sufficient to produce significant electricity for the community so is proven by a number of PLTS development across the Islands.

There are centralised PLTS built on Tambolongan, Polasi, and Rajuni Islands constructed by the central government, in this case, represented by ESDM, in the last three years. The three PLTS were granted to the regional government and operated by local management organizations at the PLTS location. Based on field observations, it was found that the three PLTSs were not functioning correctly because there was some damage and some equipment malfunctions. Replacement is required for some of the batteries and inverter. Most of the solar photovoltaic panels, the most valuable component in the system, are still in fine condition yet these non-functional systems have become partially stranded assets.





**Figure 3. Existing solar farm on Tambolongan Island**

PLTS on Tambolongan Island which was built in 2015 with a power capacity of 75 kWp, currently only functions 40% of its initial size. PLTS in Tambolongan was originally able to supply 323 houses for 12 hours with an average power of 260 Watts. Currently; it can only supply electricity from 18:00 to 21:00. The Tambolongan PLTS is located at the hillside with 10 degrees slope facing west. The solar panel is fix mounted facing the west with 10-degree tilt angle which poorly absorbs the solar incident before 12:00 pm since the back of one panel faces toward the direction of the sun. Currently, in Tambongan Island, PLTS only supplies electricity from 18:00 to 21:00, this is due to damage of several batteries, lack of technical knowledge from operators, and weak daily maintenance systems.



**Figure 4. Solar powered streetlight at Benteng port**

There is a 100 kWp PLTS which was built in 2017 on Polasi Island. The PLTS currently does not supply electricity at all and was only operated for less than a year since it was inaugurated. In the PLTS in Polasi Island, the solar panels were installed properly facing to the north with 10-degree tilt angle. The



substation is neat and tidy, and all equipment was running properly. However, it has not supplied electricity to the community for the last 6 months.

On the Islands of Rajuni and Latondu, there was also some damage to plant which caused the PLTS to only function around 30% of initial capacity. The damage was caused by the age of the equipment, and the lack of technical and managerial knowledge from the operator about the details of the operation and maintenance of the equipment. Based on the interviews we conducted, at the beginning of the PLTS construction, two weeks of training were held for operators who were local people. Comprehensive technical and managerial knowledge is essential for the operator, especially if the operator does not have any background and experience regarding the PLTS system. For handling problems in the PLTS, operators are dependent on contractors in Jakarta, both for replacing damaged equipment and analysing problems. In each PLTS, there is a monitoring system that provides all the data and status of the PLTS system in real time. The monitoring system can be accessed remotely from anywhere as long as the system is connected to the internet. However, there is no reliable internet network on these small islands so the conditions and problems that occur in PLTS cannot be resolved by remote access.

To get electricity from the PLTS, the community is required to pay Rp 12,500 per month. The price does not cover the plan to replace the battery periodically for the long term. Including the budget for replacing PLTS batteries in a customer's monthly contribution is very important because the battery is a critical component of an off-grid solar power plant and the price is very high. Also, of all solar power components, the battery is one component that has low durability and the shortest operating period / lifecycle.

It is difficult to acquire land around the villages in Selayar because almost all the area is a coconut plantation, which is the main commodity on the island. Another option is to install floating solar along the coast, which has extensive shallow water. However, installing floating solar along the coastline has a very high risk due to the west and east wind seasons.

### 3.1.1 Recommendations

- Considering the local community conditions, centralised PLTS is the best option compared to individual rooftop PV panel as the maintenance and operation of centralised PLTS is more manageable. Comprehensive capacity building and training should be provided for the PLTS operators. PLN should be involved in the operation and maintenance of the community based off-grid PLTS and available on the island. Central government are encouraged to facilitate the cooperation between regional government, PLN, and Renewable Energy Agency (EBTKE) to evaluate and establish a more sustainable business model for the PLTS.
- Approximately 5 - 10% of the project budget should be allocated to capacity building and community involvement.
- In the monthly payment scheme, the cost for the regular maintenance and component and battery replacement should be included.
- The financial status of the PLTS should be reported regularly by conducting a meeting between the operator and the community to prevent any dispute.
- The monthly bill should be reviewed annually to cover increasing maintenance and operational costs.
- Mini current breakers (MCB) installed individually for each customer need to be inspected regularly on a six-monthly basis to prevent any over usage of the electricity.
- Grid-connected rooftop solar PV can be promoted for government buildings and public facilities at the main island of Selayar to reduce the diesel fuel consumption of the diesel power plant during the day.

- Considering the limited land availability in Selayar, development of floating solar PV is possible at a bay located at the west side of Pandang village and at the small lake in Tambalongan Island with more than 300,000 m<sup>2</sup> wide equivalent with 1-2 MWp solar farm.
- As the increasing awareness in sustainable tourism, especially for western tourists, ecotourism campaigns also can be used to urge resort owners to install rooftop solar PV at their tourism facilities such as hotels and villas as part of their marketing and branding programme.



### 3.2 Wind

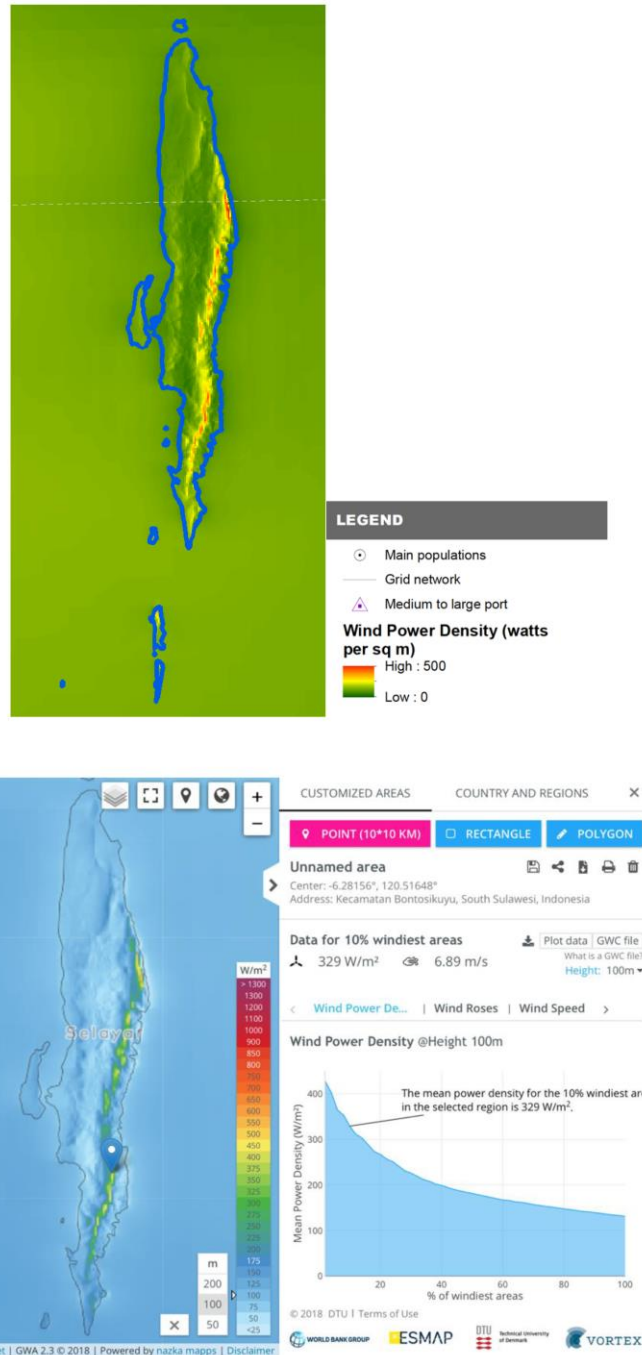


Figure 5. Secondary data from Global Wind Atlas (top) and RADMAPP (bottom)

From the map of wind potential obtained through RADMapp and the global wind atlas, it is known that the location of strong winds is along the east side of Selayar which is a plateau area. The results of the interviews conducted with the local community showed that the north and south sides of Selayar Island were locations that had excellent wind potential. Both sites were directly exposed to the west wind and east wind; each of which occurred from December to March and June to September retrospectively. During the monsoons in the east and west, the strength of the winds causes disruption to the local fishing industry, with many unable to go out to sea, there is also considerable marine litter deposited along the shoreline consisting mainly of wood and plastics.

Construction of the wind farm development on the western side of Selayar Island, which is a highland and hilly region, needs to take the narrow and winding road conditions into account. The road conditions will greatly affect the size of blades that can be transported, and the capacity of the heavy equipment needed for the construction of the project.

The data in Table 2 shows that at the measurement locations, the average wind speed is 7.45 m/s for offshore and 2.97 m/s for onshore and the maximum current speed was 8.6 m/s. Based on visual inspection on the existing anemometer during the measurement, the wind blows constantly at a height of 20 m from the ground.

Table 2. Wind velocity measured at sites

Type	Location	Average (m/s)		Average (m/s)
Offshore	Tambolongan	7.034	Average Offshore	7.456
	Padang	7.879		
Onshore	Tanadoang	3.042	Average Onshore	2.978
	Tanadoang	2.545		
	Bontomatene	3.346		

The wind speed at both locations might be higher and more stable if the sensor has located at a minimum of 10 m from the ground. As observed during measurement, there were a lot of trees which were taller than the measurement pole. The wind speed was reduced significantly as the wind was blocked by the trees.

Puncak Tanadoang is located in hilly terrain with a winding road unsuitable for a long vehicle to transport cranes and rotor blades for wind farm construction.

At the other location where the existing broken wind turbines are located, the terrain is relatively flat and open and exposed to westerly and easterly wind. This location is more suitable for wind farm development based on the topography and geographical location. In addition, this location is located more than 5 km from a residential area. Thus, the noise impact from the wind farm operation will not disturb the surrounding community. At both locations, grid connection is available.

In 2008, two wind turbines were constructed in Bontomatene village at the northern part of Selayar Island, each with a capacity of 85 kW, which is connected to the grid. Currently, the wind turbines are no longer operating and have severe damage on the rotor and substations. Some crucial components of the PLTB have been stolen and vandalised. The two wind turbines are less than 100 m from each other, and there is a wind measuring station consisting of three anemometers which are arranged vertically 10 metres apart from each other. The existence of PLTB on Selayar Island shows that previously there has been a study of wind potential on Selayar Island.



### 3.2.1 Recommendations

Considering the transportation access and the topographical condition of the site, Bontomatene is more suitable for the development of PLTB. The existing wind turbines can be refurbished and reactivated for a pilot project and research purposes. The availability of land in that location is very large, most of which is only covered with shrubs and is not arable and productive land. It is the recommendation that the local PLN office be involved in the development project as well as in the operation and maintenance of the wind turbines. The development of a windfarm could significantly reduce diesel consumption for electricity generation.

The wind station at the location can be refurbished and redeployed to obtain long-term measurement. The data from the logger can be downloaded to get the actual long-term measurement, which would need to be recorded for more than a year. If recorded data from the wind station can be downloaded, it will be very useful and can be used to calculate the electricity potential that can be generated in one year and make the optimum turbine design. The results of the calculation of power output can be used to create a business scenario and feasibility study. If the anemometer in the wind station has been damaged, it needs to be replaced without changing the existing tower.

Existing grid connection at this location is a big advantage for wind farm development. The previous feasibility study report of the existing wind turbine would be beneficial for reference in future research and should be available at the ESDM office.



### 3.3 Tidal

The tidal measurement was not conducted at the strongest current locations listed on RADMAPP due to accessibility issues. Measurements were taken at the next best location, based on local knowledge.

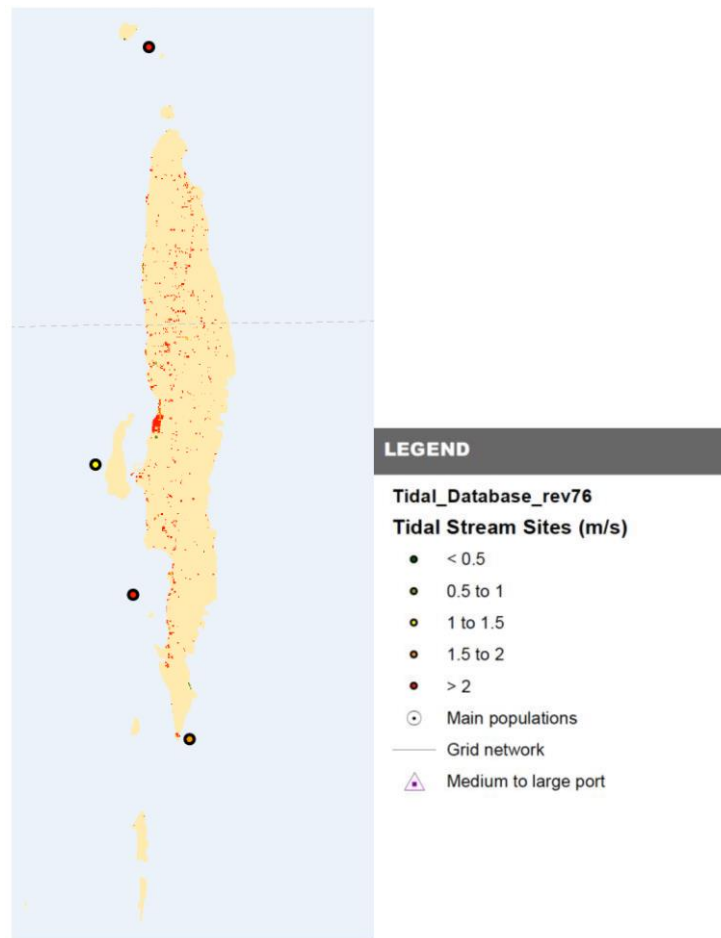


Figure 6. Identified tidal stream sites from RADMAPP

The data in Table 3 shows that at the measurement locations, the average current speed is 0.42 m/s for Tambolongan and 0.14 m/s for Padang. The maximum current speed was 0.7 m/s during ebb and flood tides at Tambolongan and 0.3 m/s for flood tides and 0.1 for ebb tides at Padang. Both measurements were conducted in a narrowing strait located less than 5 miles from the shore. The tide is a mix semidiurnal (occurring twice a day with a range of low and high tides) with maximum range of 1.64 m.

Table 3. Tide velocity measured at sites

Site	Average velocity (m/s)	Maximum Flood (m/s)	Maximum Ebb (m/s)
Tambolongan	0,42	0,7	0,7
Padang	0,14	0,3	0,1



Based on the measurement data, the tidal energy in both locations is lower than the minimum current speed for the deployment of tidal energy conversion technology. Considering the high up-front investment required for the development of tidal energy conversion, tidal energy conversion is unlikely to be economically viable.

### 3.3.1 Recommendations

Further research can be conducted at a different site identified by RADMAPP using appropriate vessel during the transition time from westerly season to easterly season or vice versa. The measurement should be carried out using ocean current meter equipped with a compass and self-recording unit.

### 3.4 Biomass and Waste

During field observations on Selayar Island, Tambolongan, and Polasi, it was discovered that coconut production from smallholder plantations was huge. The community sell copra and coconut shell to collectors in Benteng or send directly to Makassar (mainland). The by-products of copra production are coconut shells and coconut fibre. Coconut shells can be sold for raw materials to produce coconut charcoal; however, coconut husks are largely discarded as they have no economic value and only a small portion is used for cooking.

Discarded coconut husk is stacked and partly burned with leaves and domestic waste. Exploring the potential use of discarded husks as a biomass fuel that can be used to generate much needed electricity for the community and will be beneficial in reducing waste.

Tambolongan and Polasi Island communities already have electricity networks and other supporting infrastructure such as the MCB network of street lighting that are built together with the construction of solar power plants. Thus, the development of a biomass power plant (PLTBm) can be retrofitted with existing PLTS to form a hybrid system.

Table 4 Biomass potential at Selayar (Selayar, 2018)

	Production (Ton/year)	Husk (Ton/year)	Ton/day
<b>Coconut</b>	21,170	7,409.5	20.3
<b>Corn</b>	8,264	1,488	4.07
<b>Rice</b>	36,839	36,839	100.92
<b>Total</b>		45,736	125.3

Table 4 shows that the production of agricultural waste biomass in Kabupaten Kepulauan Selayar reaches 125.3 Tonnes/day. Assuming that PLTBm has overall efficiency of 25%, and average biomass calorific value is 15 MJ/kg. The plant produces 131 MWh electricity per day with capacity of 5.4 MW. There is additional biomass fuel from ocean waste, which means the total daily electricity production will be significantly greater.

With the combination of PLTBm and PLTS, the community of Tambolongan and Polasi Islands are expected to be able to meet their electricity needs independently by using the resources on the Islands without having to depend on external energy supply. In addition to the supply of raw materials, if the quantity of coconut fibre is still below the minimum supply of PLTBm, it can be combined with coconut shells, coconut leaves, and wood waste which can be easily found along the Island's coastline. Coconut shells can be obtained at a price from residents because it has economic value for sale or used to make charcoal. This supports the waste to wealth concept which may be of interest to government agencies in Selayar

Coconut fibre and other raw materials can be processed first by drying and chopping into small pieces to increase the efficiency of PLTBm. The fuel conditioning for biomass requires additional costs that must be calculated further, so that it can be seen whether the added value of efficiency can exceed the processing costs.



Currently, coconut fibre can be obtained free from the public, but if the demand for coconut fibre increases along with the construction of PLTBm, it is possible that the price of coconut fibre will increase. In addition, the costs of collecting and transporting biomass PLT raw materials must also be considered, given the presence of coconut fibre throughout the Island, and the limited mode of transportation on the Island. The development of PTLBm is expected to boost the economic activity in the Islands and promote inclusive growth which provides additional income for the community.

The potential for wood waste from the sea and from coconut plantations is large, especially in the west and east monsoons. This can be used as additional raw material for biomass PLT, but further quantification is needed to determine the exact amount.



Figure 7. Log and wood waste from the ocean

Waste is a severe problem experienced by residents of the Islands. The waste on the Island is not only produced by the daily activities of the community, but also from the marine waste that is brought by the tides. This is due to the absence of waste processing facilities and a large amount of waste deposited from the sea. This marine waste is especially prevalent in the west and east seasons, where high winds carry tens of tons of marine litter from outside the Islands. No precautionary measures have been identified to date to prevent the deposition of waste from the sea. To overcome this waste problem, one possible solution is the use of waste-powered electricity generation technology. With this technology, solid waste that cannot be recycled can be burned in an incinerator to produce heat which can be used to produce steam to drive turbines and generators for electricity production. This waste power plant can also be combined with biomass power plants. However, modifications would be required, to adjust the heat output produced, given the fact that calorific value of waste and biomass is different.



Figure 8. Ocean waste consisting of plastic and timber

The heat produced from the plant can be used for electricity generation, drying the coconut and fish, processing copra to produce coconut oil, and processing coconut water. The excess of electricity produced can be used for ice production for the cold storage requirements of the fishery industry which can significantly boost the productivity as the ice production is far below the demand and only produced on the main Island of Selayar.

With low-carbon technology currently available, biomass PLT and waste can produce low carbon emissions which are less harmful to the environment. This is different from normal waste combustion that produces potentially high carbon emissions with no electricity generation to benefit communities. The ash produced from the Biomass power plant and waste-to-energy plant can be sent to landfill, used as fertilizer, or used as building blocks depending on the number of chemicals and compounds it may contain.

At present, communities of Tambolongan and Polasi Island manage waste by burning it releasing significant air pollution.

### 3.4.1 Recommendations

The Biomass powerplant and waste-to-energy plant can be hybridized with existing PLTSs to produce more reliable power supply for the Islands, minimising the use of batteries to provide non-intermittent power supply as well as reducing diesel consumption for PLTD.

Further feasibility, including quantitative research, should be conducted to assess the daily and seasonal availability of biomass feedstock and waste production and to investigate the economic, social, and environmental aspect of the plant. The incineration ash and air pollution of the biomass power plant and waste-to-energy plant require careful treatment to prevent negative environmental impact.



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It is recommended that an ABCG (Academic, Business, Community, Government) model of partnership initiates a pilot project. The regional government are encouraged to actively promote the biomass energy potential to investors and seek support from central government (in this case represented by EBTKE) to take this forward.

## 4. CONCLUSION

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There are significant renewable energy resource options across the core, transition and buffer zones of the Biosphere Reserve and the wider Selayar region. The preliminary resources assessment measurements can be shared with Academic, Business, Community and Government partners.

An unexpected finding during the course of this fieldwork was the potential for biomass production with the region and the waste to energy opportunities similarly, the development of ecotourism links well to this study.

The recommendations in this report encourage further investigation, potential pilot programmes and action based on the fieldwork undertaken in the region and across a number of diverse locations.



## 5. REFERENCES

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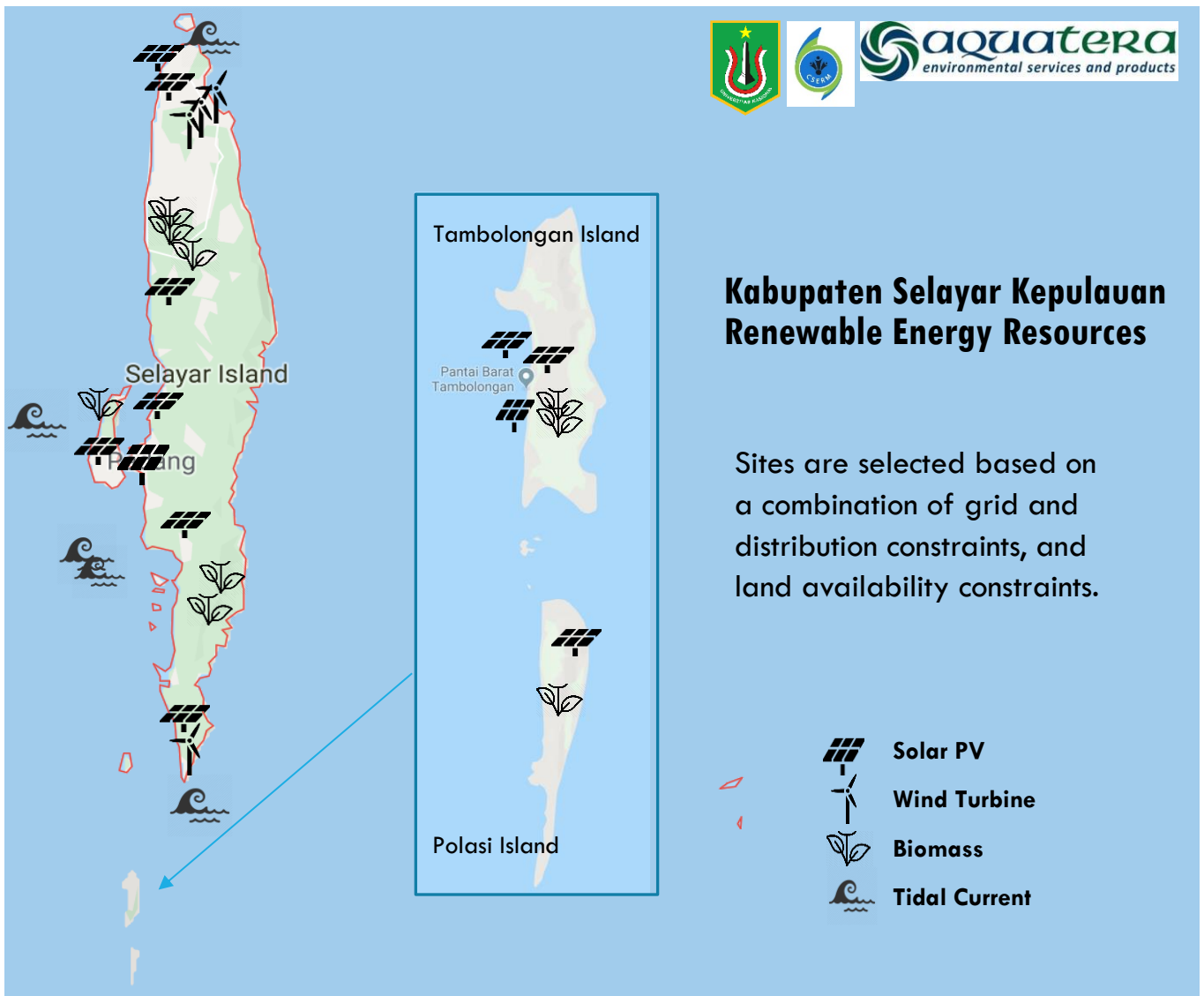
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## 6. APPENDICES

### 6.1 Visual representation of site locations



## 6.2 Daily solar irradiance

**Appendix Table 1, Daily solar irradiance 18 June 2019**

Site Name:	Benteng Port	Date:	18/06/2019	Equipment:
Location:				
	Lat: -6.498358	Long: 120.483450		
Elevation:	+ 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m <sup>2</sup> )	Air Temperature (degree C)	PV Power output (W/m <sup>2</sup> )	Remark
10:10:25	848.7		95.48	
10:10:55	867.3		97.57	
10:11:25	859.7		96.72	
10:11:55	859.1		96.65	
10:12:25	860.7		96.83	
10:12:55	862.1		96.99	
10:13:25	859.3		96.67	
10:13:55	853.9		96.06	
10:14:25	854		96.08	
10:14:55	857.2		96.44	
10:15:25	858.9		96.63	
10:15:55	863.2		97.11	
10:16:25	871		97.99	
10:16:55	873		98.21	
10:17:25	878		98.78	
10:17:55	899.2		101.16	
10:18:25	637.9		71.76	
10:18:55	904.6		101.77	
10:19:25	880.3		99.03	
10:19:55	883.5		99.39	
10:20:25	203.5		22.89	
10:20:55	884.1		99.46	
10:21:25	879.1		98.90	
10:21:55	871.9		98.09	
10:22:25	870		97.88	
10:22:55	877.2		98.69	
10:23:25	887.5		99.84	
10:23:55	900.1		101.26	
10:24:25	927.2		104.31	
10:24:55	898.7		101.10	
10:25:25	888.2		99.92	

10:25:55	893.2		100.49	
10:26:25	895.2		100.71	
10:26:55	893.8		100.55	
10:27:25	895.2		100.71	
10:27:55	894.9		100.68	
10:28:25	895.5		100.74	
10:28:55	897.6		100.98	
10:29:25	893.2		100.49	
10:29:55	894.1		100.59	
10:30:25	891.6		100.31	
10:30:55	892.2		100.37	
10:31:25	892.4		100.40	
10:31:55	898.5		101.08	
10:32:25	906.9		102.03	
10:32:55	913.9		102.81	
10:33:25	931.6		104.81	
10:33:55	954.6		107.39	
10:34:25	158.3		17.81	
10:34:55	148.5		16.71	
10:35:25	175.9		19.79	
10:35:55	859.7		96.72	
10:36:25	250.6		28.19	
10:36:55	923.2		103.86	
10:37:25	949.1		106.77	
10:37:55	467.1		52.55	
10:38:25	1024		115.20	
10:38:55	1004		112.95	
10:39:25	1004		112.95	
10:39:55	1011		113.74	
10:40:25	1004		112.95	
10:40:55	1000		112.50	
10:41:25	993.2		111.74	
10:41:55	986.1		110.94	
10:42:25	978.2		110.05	
10:42:55	987.2		111.06	
10:43:25	216.9		24.40	
10:43:55	357.7		40.24	
10:44:25	963.5		108.39	
10:44:55	963		108.34	
10:45:25	953.5		107.27	
10:45:55	936.4		105.35	
10:46:25	924.5		104.01	



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10:46:55	921.2		103.64	
10:47:25	918.7		103.35	
10:47:55	914.9		102.93	
10:48:25	913.4		102.76	
10:48:55	909.5		102.32	
10:49:25	909		102.26	
10:49:55	908.7		102.23	
10:50:25	910.9		102.48	
10:50:55	905.7		101.89	
10:51:25	908		102.15	
10:51:55	908.7		102.23	
10:52:25	906.9		102.03	
10:52:55	905		101.81	
10:53:25	902.7		101.55	
10:53:55	901.1		101.37	
10:54:25	899.5		101.19	
10:54:55	899.8		101.23	
10:55:25	907.1		102.05	
10:55:55	900.1		101.26	
10:56:25	900.9		101.35	
10:56:55	905.8		101.90	
10:57:25	918.2		103.30	
10:57:55	948.9		106.75	
10:58:25	460.2		51.77	
10:58:55	560.7		63.08	
10:59:25	510.4		57.42	
10:59:55	943.5		106.14	
11:00:25	935.1		105.20	
11:00:55	931.6		104.81	
11:01:25	891.3		100.27	
11:01:55	930.7		104.70	
11:02:25	931.6		104.81	
11:02:55	936.2		105.32	
11:03:25	941.5		105.92	
11:03:55	940		105.75	
11:04:25	945.7		106.39	
11:04:55	952.7		107.18	
11:05:25	955.6		107.51	
11:05:55	959		107.89	
11:06:25	959.7		107.97	
11:06:55	957.6		107.73	
11:07:25	955.9		107.54	

11:07:55	967.3		108.82	
11:08:25	957.3		107.70	
11:08:55	951		106.99	
11:09:25	956.2		107.57	
11:09:55	956.8		107.64	
11:10:25	954.3		107.36	
11:10:55	952.1		107.11	
11:11:25	950.3		106.91	
11:11:55	951.4		107.03	
11:12:25	951.3		107.02	
11:12:55	947.3		106.57	
11:13:25	920.1		103.51	
11:13:55	945.3		106.35	
11:14:25	930.8		104.72	
11:14:55	928.9		104.50	
11:15:25	925.6		104.13	
11:15:55	919		103.39	
11:16:25	915.8		103.03	
11:16:55	914.5		102.88	
11:17:25	912.8		102.69	
11:17:55	910.7		102.45	
11:18:25	910.9		102.48	
11:18:55	911.8		102.58	
11:19:25	914.2		102.85	
11:19:55	924.8		104.04	
11:20:25	944.1		106.21	
11:20:55	976.3		109.83	
11:21:25	578.2		65.05	
11:21:55	620.9		69.85	
11:22:25	944.5		106.26	
11:22:55	975.7		109.77	
11:23:25	951.6		107.06	
11:23:55	934.2		105.10	
11:24:25	920.2		103.52	
11:24:55	916.1		103.06	
11:25:25	912.2		102.62	
11:25:55	913.1		102.72	
11:26:25	910.6		102.44	
11:26:55	908.5		102.21	
11:27:25	907.2		102.06	
11:27:55	907.9		102.14	
11:28:25	907.7		102.12	



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11:28:55	909.3		102.30	
11:29:25	913		102.71	
11:29:55	912.6		102.67	
11:30:25	913.3		102.75	
11:30:55	910.3		102.41	
11:31:25	911		102.49	
11:31:55	911.2		102.51	
11:32:25	911.4		102.53	
11:32:55	911.7		102.57	
11:33:25	913		102.71	
11:33:55	913.6		102.78	
11:34:25	912.5		102.66	
11:34:55	910.7		102.45	
11:35:25	910.1		102.39	
11:35:55	909.1		102.27	
11:36:25	908.8		102.24	
11:36:55	908.7		102.23	
11:37:25	911.2		102.51	
11:37:55	911.2		102.51	
11:38:25	914.1		102.84	
11:38:55	912.2		102.62	
11:39:25	912.2		102.62	
11:39:55	913.7		102.79	
11:40:25	913		102.71	
11:40:55	911.8		102.58	
11:41:25	911.2		102.51	
11:41:55	908.7		102.23	
11:42:25	911.2		102.51	
11:42:55	911.5		102.54	
11:43:25	909		102.26	
11:43:55	910.6		102.44	
11:44:25	909.1		102.27	
11:44:55	908.8		102.24	
11:45:25	907.7		102.12	
11:45:55	910.3		102.41	
11:46:25	911.5		102.54	
11:46:55	912.2		102.62	
11:47:25	909.8		102.35	
11:47:55	911.8		102.58	
11:48:25	914.2		102.85	
11:48:55	913.1		102.72	
11:49:25	914.2		102.85	

11:49:55	913.9		102.81	
11:50:25	914.1		102.84	
11:50:55	921.2		103.64	
11:51:25	920.1		103.51	
11:51:55	920.7		103.58	
11:52:25	913.1		102.72	
11:52:55	913.4		102.76	
11:53:25	909.5		102.32	
11:53:55	913.1		102.72	
11:54:25	914.1		102.84	
11:54:55	912.8		102.69	
11:55:25	911		102.49	
11:55:55	909.8		102.35	
11:56:25	909.8		102.35	
11:56:55	910.4		102.42	
11:57:25	911		102.49	
11:57:55	911		102.49	
11:58:25	910.6		102.44	
11:58:55	910.6		102.44	
11:59:25	909.1		102.27	
11:59:55	910.6		102.44	
12:00:25	908.5		102.21	
12:00:55	910.7		102.45	
12:01:25	910.4		102.42	
12:01:55	911.4		102.53	
12:02:25	910.7		102.45	
12:02:55	910.1		102.39	
12:03:25	912.5		102.66	
12:03:55	913.1		102.72	
12:04:25	911.8		102.58	
12:04:55	909		102.26	
12:05:25	910.7		102.45	
12:05:55	909.5		102.32	
12:06:25	906.5		101.98	
12:06:55	908.2		102.17	
12:07:25	911.2		102.51	
12:07:55	909.1		102.27	
12:08:25	910.4		102.42	
12:08:55	910.9		102.48	
12:09:25	909.8		102.35	
12:09:55	908.5		102.21	
12:10:25	907.4		102.08	





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12:10:55	907.9		102.14	
12:11:25	909		102.26	
12:11:55	910.1		102.39	
12:12:25	909.9		102.36	
12:12:55	910.4		102.42	
12:13:25	910.4		102.42	
12:13:55	910.6		102.44	
12:14:25	912.8		102.69	
12:14:55	915.8		103.03	
12:15:25	915.2		102.96	
12:15:55	913.6		102.78	
12:16:25	914.1		102.84	
12:16:55	916.8		103.14	
12:17:25	915		102.94	
12:17:55	913.4		102.76	
12:18:25	910.9		102.48	
12:18:55	914.4		102.87	
12:19:25	913.3		102.75	
12:19:55	915.8		103.03	
12:20:25	915.2		102.96	
12:20:55	914.7		102.90	
12:21:25	913		102.71	
12:21:55	913.1		102.72	
12:22:25	912.8		102.69	
12:22:55	909.9		102.36	
12:23:25	907.6		102.11	
12:23:55	909.3		102.30	
12:24:25	909.8		102.35	
12:24:55	910.3		102.41	
12:25:25	909.1		102.27	
12:25:55	908.2		102.17	
12:26:25	909.6		102.33	
12:26:55	908.2		102.17	
12:27:25	904.1		101.71	
12:27:55	903.1		101.60	
12:28:25	905.3		101.85	
12:28:55	905		101.81	
12:29:25	903.4		101.63	
12:29:55	904.4		101.75	
12:30:25	900.6		101.32	
12:30:55	900.8		101.34	
12:31:25	901.1		101.37	

12:31:55	902.2		101.50	
12:32:25	899.6		101.21	
12:32:55	898.9		101.13	
12:33:25	898.1		101.04	
12:33:55	896.6		100.87	
12:34:25	897.1		100.92	
12:34:55	709.6		79.83	
12:35:25	820.6		92.32	
12:35:55	873.7		98.29	
12:36:25	841.1		94.62	
12:36:55	852.1		95.86	
12:37:25	917.1		103.17	
12:37:55	917.4		103.21	
12:38:25	880.8		99.09	
12:38:55	982.8		110.57	
12:39:25	950		106.88	
12:39:55	922.5		103.78	
12:40:25	899.8		101.23	
12:40:55	912		102.60	
12:41:25	913.7		102.79	
12:41:55	925.5		104.12	
12:42:25	380		42.75	
12:42:55	447.2		50.31	
12:43:25	388.3		43.68	
12:43:55	371.6		41.81	
12:44:25	464.8		52.29	
12:44:55	541.6		60.93	
12:45:25	736.4		82.85	
12:45:55	880.3		99.03	
12:46:25	929.9		104.61	
12:46:55	939.4		105.68	
12:47:25	939.1		105.65	
12:47:55	938		105.53	
12:48:25	940.8		105.84	
12:48:55	938.6		105.59	
12:49:25	941		105.86	
12:49:55	940.7		105.83	
12:50:25	940.7		105.83	
12:50:55	941.8		105.95	
12:51:25	938.3		105.56	
12:51:55	938.9		105.63	
12:52:25	940.3		105.78	



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12:52:55	937.5		105.47	
12:53:25	935.3		105.22	
12:53:55	937.5		105.47	
12:54:25	942.9		106.08	
12:54:55	939.6		105.71	
12:55:25	935.3		105.22	
12:55:55	936.9		105.40	
12:56:25	935.8		105.28	
12:56:55	937.8		105.50	
12:57:25	938.6		105.59	
12:57:55	935.3		105.22	
12:58:25	937.3		105.45	
12:58:55	936.9		105.40	
12:59:25	935.4		105.23	
12:59:55	938.3		105.56	
13:00:25	931.3		104.77	
13:00:55	931.8		104.83	
13:01:25	933.1		104.97	
13:01:55	938.6		105.59	
13:02:25	932.7		104.93	
13:02:55	928.5		104.46	
13:03:25	927.8		104.38	
13:03:55	924.2		103.97	
13:04:25	930.2		104.65	
13:04:55	929.6		104.58	
13:05:25	928.6		104.47	
13:05:55	927		104.29	
13:06:25	927		104.29	
13:06:55	923.2		103.86	
13:07:25	926.9		104.28	
13:07:55	928.3		104.43	
13:08:25	922		103.73	
13:08:55	923.7		103.92	
13:09:25	925.5		104.12	
13:09:55	922.3		103.76	
13:10:25	922.6		103.79	
13:10:55	923.4		103.88	
13:11:25	925.6		104.13	
13:11:55	923.2		103.86	
13:12:25	924.7		104.03	
13:12:55	922.3		103.76	
13:13:25	919		103.39	

13:13:55	919.8		103.48	
13:14:25	913		102.71	
13:14:55	911		102.49	
13:15:25	913		102.71	
13:15:55	912		102.60	
13:16:25	916.4		103.10	
13:16:55	912.6		102.67	
13:17:25	915.3		102.97	
13:17:55	917.2		103.19	
13:18:25	913		102.71	
13:18:55	914.5		102.88	
13:19:25	913.6		102.78	
13:19:55	911.4		102.53	
13:20:25	907.2		102.06	
13:20:55	905.2		101.84	
13:21:25	909.5		102.32	
13:21:55	906		101.93	
13:22:25	903.1		101.60	
13:22:55	907.4		102.08	
13:23:25	904.6		101.77	
13:23:55	903.6		101.66	
13:24:25	902.7		101.55	
13:24:55	907.1		102.05	
13:25:25	899		101.14	
13:25:55	899.3		101.17	
13:26:25	889.8		100.10	
13:26:55	889.8		100.10	
13:27:25	891.3		100.27	
13:27:55	890.5		100.18	
13:28:25	886.2		99.70	
13:28:55	888.7		99.98	
13:29:25	886.5		99.73	
13:29:55	885.4		99.61	
13:30:25	884.6		99.52	
13:30:55	885.2		99.59	
13:31:25	884		99.45	
13:31:55	880.2		99.02	
13:32:25	874.8		98.42	
13:32:55	880.8		99.09	
13:33:25	876.1		98.56	
13:33:55	874.5		98.38	
13:34:25	876.2		98.57	



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13:34:55	874.1		98.34	
13:35:25	875.7		98.52	
13:35:55	875.7		98.52	
13:36:25	870		97.88	
13:36:55	874.9		98.43	
13:37:25	871.3		98.02	
13:37:55	868.8		97.74	
13:38:25	867.2		97.56	
13:38:55	863.5		97.14	
13:39:25	865		97.31	
13:39:55	860.5		96.81	
13:40:25	859.1		96.65	
13:40:55	859.3		96.67	
13:41:25	860.4		96.80	
13:41:55	860.8		96.84	
13:42:25	856.7		96.38	
13:42:55	854.4		96.12	
13:43:25	853.1		95.97	
13:43:55	852		95.85	
13:44:25	853.2		95.99	
13:44:55	851.3		95.77	
13:45:25	850.2		95.65	
13:45:55	849.4		95.56	
13:46:25	848		95.40	
13:46:55	843.4		94.88	
13:47:25	744.8		83.79	
13:47:55	695		78.19	
13:48:25	630.4		70.92	
13:48:55	724.6		81.52	
13:49:25	763.3		85.87	
13:49:55	731.6		82.31	
13:50:25	729.4		82.06	
13:50:55	726.2		81.70	
13:51:25	726.2		81.70	
13:51:55	726.4		81.72	
13:52:25	724.6		81.52	
13:52:55	716.6		80.62	
13:53:25	738.3		83.06	
13:53:55	735.6		82.76	
13:54:25	43.3		4.87	
13:54:55	718.6		80.84	
13:55:25	684.7		77.03	

13:55:55	700.3		78.78	
13:56:25	697.1		78.42	
13:56:55	694.7		78.15	
13:57:25	697.7		78.49	
13:57:55	741.3		83.40	
13:58:25	762.5		85.78	
13:58:55	762.3		85.76	
13:59:25	762.8		85.82	
13:59:55	760.9		85.60	
14:00:25	757.3		85.20	
14:00:55	757.3		85.20	
14:01:25	756.3		85.08	
14:01:55	755.1		84.95	
14:02:25	753.5		84.77	
14:02:55	753.6		84.78	
14:03:25	755.2		84.96	
14:03:55	756.3		85.08	
14:04:25	751.9		84.59	
14:04:55	749.5		84.32	
14:05:25	750.1		84.39	
14:05:55	747.3		84.07	
14:06:25	747.3		84.07	
14:06:55	742.2		83.50	
14:07:25	743.3		83.62	
14:07:55	738.3		83.06	
14:08:25	742.4		83.52	
14:08:55	738.4		83.07	
14:09:25	736.8		82.89	
14:09:55	736.8		82.89	
14:10:25	734.9		82.68	
14:10:55	735.6		82.76	
14:11:25	729.9		82.11	
14:11:55	728.9		82.00	
14:12:25	727.5		81.84	
14:12:55	723.2		81.36	
14:13:25	727.8		81.88	
14:13:55	725.6		81.63	
14:14:25	722.7		81.30	
14:14:55	718.3		80.81	
14:15:25	721.2		81.14	
14:15:55	719.9		80.99	
14:16:25	717.7		80.74	



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14:16:55	716.3		80.58	
14:17:25	718.2		80.80	
14:17:55	713.7		80.29	
14:18:25	712		80.10	
14:18:55	712.9		80.20	
14:19:25	710.2		79.90	
14:19:55	711.2		80.01	
14:20:25	708.7		79.73	
14:20:55	705.5		79.37	
14:21:25	705.2		79.34	
14:21:55	702.2		79.00	
14:22:25	700.9		78.85	
14:22:55	698.5		78.58	
14:23:25	703.7		79.17	
14:23:55	700.4		78.80	
14:24:25	697.3		78.45	
14:24:55	695		78.19	
14:25:25	693.1		77.97	
14:25:55	692.7		77.93	
14:26:25	690.1		77.64	
14:26:55	689.5		77.57	
14:27:25	688.4		77.45	
14:27:55	684.3		76.98	
14:28:25	684.7		77.03	
14:28:55	687		77.29	
14:29:25	683.3		76.87	
14:29:55	680		76.50	
14:30:25	679.5		76.44	
14:30:55	680.5		76.56	
14:31:25	677.9		76.26	
14:31:55	671.9		75.59	
14:32:25	673.3		75.75	
14:32:55	671.4		75.53	
14:33:25	671.6		75.56	
14:33:55	670.5		75.43	
14:34:25	669.1		75.27	
14:34:55	670		75.38	
14:35:25	666.8		75.02	
14:35:55	663.4		74.63	
14:36:25	663.7		74.67	
14:36:55	662.7		74.55	
14:37:25	662.1		74.49	



14:37:55	657.8		74.00	
14:38:25	655.6		73.76	
14:38:55	656.5		73.86	
14:39:25	653.9		73.56	
14:39:55	651.6		73.31	
14:40:25	648.6		72.97	
14:40:55	646.1		72.69	
14:41:25	647.5		72.84	
14:41:55	646.6		72.74	
14:42:25	642.6		72.29	
14:42:55	644.2		72.47	
14:43:25	642.8		72.32	
14:43:55	642.3		72.26	
14:44:25	640.9		72.10	
14:44:55	636.4		71.60	
14:45:25	632.5		71.16	
14:45:55	629.9		70.86	
14:46:25	631.1		71.00	
14:46:55	632.2		71.12	
14:47:25	629.2		70.79	
14:47:55	628.7		70.73	
14:48:25	628.7		70.73	
14:48:55	626.5		70.48	
14:49:25	623.9		70.19	
14:49:55	621.7		69.94	
14:50:25	620.3		69.78	
14:50:55	616.8		69.39	
14:51:25	613		68.96	
14:51:55	613.2		68.99	
14:52:25	610.3		68.66	
14:52:55	610.3		68.66	
14:53:25	607.1		68.30	
14:53:55	611.1		68.75	
14:54:25	610		68.63	
14:54:55	606.2		68.20	
14:55:25	606.3		68.21	
14:55:55	607		68.29	
14:56:25	602.2		67.75	
14:56:55	601.3		67.65	
14:57:25	601.1		67.62	
14:57:55	598.4		67.32	
14:58:25	598.4		67.32	



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14:58:55	596.7		67.13	
14:59:25	593		66.71	
14:59:55	586.2		65.95	
Average	<b>835.7</b>		<b>94.01</b>	

**Appendix Table 2, Daily solar irradiance 19 June 2019**

Site Name:	TPI Port	Date:	19/06/2019	Equipment:
Location:				
	Lat: -6.123729	Long: 120.456012		
Elevation:	+ 1 meter	Time Zone:	WITA	

Time	Solar irradiance (W/m <sup>2</sup> )	Air Temperature (degree C)	PV Power output (W/m <sup>2</sup> )	Remark
09:00:24	564.1		63.46125	
09:00:54	568.3		63.93375	
09:01:24	569.9		64.11375	
09:01:54	569.6		64.08	
09:02:24	572.5		64.40625	
09:02:54	577.2		64.935	
09:03:24	578		65.025	
09:03:54	580.4		65.295	
09:04:24	586.2		65.9475	
09:04:54	585		65.8125	
09:05:24	586.5		65.98125	
09:05:54	588.8		66.24	
09:06:24	587.7		66.11625	
09:06:54	588		66.15	
09:07:24	587.8		66.1275	
09:07:54	585.3		65.84625	
09:08:24	591.5		66.54375	
09:08:54	591.3		66.52125	
09:09:24	592.1		66.61125	
09:09:54	590.8		66.465	
09:10:24	596.8		67.14	
09:10:54	597.3		67.19625	
09:11:24	600.2		67.5225	
09:11:54	598.4		67.32	
09:12:24	600		67.5	
09:12:54	600.6		67.5675	
09:13:24	600.5		67.55625	
09:13:54	598.4		67.32	
09:14:24	599.5		67.44375	
09:14:54	601.9		67.71375	
09:15:24	598		67.275	
09:15:54	598.6		67.3425	



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09:16:24	597	67.1625	
09:16:54	601	67.6125	
09:17:24	598.3	67.30875	
09:17:54	604.3	67.98375	
09:18:24	599.9	67.48875	
09:18:54	610.3	68.65875	
09:19:24	609.4	68.5575	
09:19:54	612	68.85	
09:20:24	611.7	68.81625	
09:20:54	608.9	68.50125	
09:21:24	613.3	68.99625	
09:21:54	617.6	69.48	
09:22:24	524.9	59.05125	
09:22:54	482	54.225	
09:23:24	595.7	67.01625	
09:23:54	562	63.225	
09:24:24	421.2	47.385	
09:24:54	621.7	69.94125	
09:25:24	618.7	69.60375	
09:25:54	619.6	69.705	
09:26:24	620.3	69.78375	
09:26:54	619.3	69.67125	
09:27:24	622.3	70.00875	
09:27:54	624.9	70.30125	
09:28:24	628.2	70.6725	
09:28:54	628.4	70.695	
09:29:24	628	70.65	
09:29:54	603.2	67.86	
09:30:24	641.5	72.16875	
09:30:54	640.7	72.07875	
09:31:24	644.2	72.4725	
09:31:54	645.1	72.57375	
09:32:24	648.6	72.9675	
09:32:54	654.3	73.60875	
09:33:24	663.5	74.64375	
09:33:54	668.6	75.2175	
09:34:24	658.4	74.07	
09:34:54	658	74.025	
09:35:24	657	73.9125	
09:35:54	646.1	72.68625	
09:36:24	660.5	74.30625	
09:36:54	683	76.8375	

09:37:24	637.2		71.685	
09:37:54	646.1		72.68625	
09:38:24	690.3		77.65875	
09:38:54	640.1		72.01125	
09:39:24	587.3		66.07125	
09:39:54	630.1		70.88625	
09:40:24	594.9		66.92625	
09:40:54	621.2		69.885	
09:41:24	488.5		54.95625	
09:41:54	401.4		45.1575	
09:42:24	590.7		66.45375	
09:42:54	766.1		86.18625	
09:43:24	664		74.7	
09:43:54	633.6		71.28	
09:44:24	610.9		68.72625	
09:44:54	563.4		63.3825	
09:45:24	536		60.3	
09:45:54	458.6		51.5925	
09:46:24	784.2		88.2225	
09:46:54	728.4		81.945	
09:47:24	734		82.575	
09:47:54	747.6		84.105	
09:48:24	791		88.9875	
09:48:54	869.1		97.77375	
09:49:24	875.1		98.44875	
09:49:54	749.4		84.3075	
09:50:24	657.5		73.96875	
09:50:54	492.5		55.40625	
09:51:24	400.8		45.09	
09:51:54	324.9		36.55125	
09:52:24	231.8		26.0775	
09:52:54	200.8		22.59	
09:53:24	183.3		20.62125	
09:53:54	183.2		20.61	
09:54:24	186.2		20.9475	
09:54:54	191.4		21.5325	
09:55:24	207.3		23.32125	
09:55:54	217.4		24.4575	
09:56:24	227		25.5375	
09:56:54	248.9		28.00125	
09:57:24	282.6		31.7925	
09:57:54	267.4		30.0825	



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09:58:24	255.7		28.76625	
09:58:54	261.6		29.43	
09:59:24	263.2		29.61	
09:59:54	261.1		29.37375	
10:00:24	252.1		28.36125	
10:00:54	243.5		27.39375	
10:01:24	236.2		26.5725	
10:01:54	231.6		26.055	
10:02:24	224.8		25.29	
10:02:54	221.5		24.91875	
10:03:24	219.4		24.6825	
10:03:54	219.9		24.73875	
10:04:24	221.3		24.89625	
10:04:54	223.7		25.16625	
10:05:24	227.4		25.5825	
10:05:54	233.4		26.2575	
10:06:24	241.5		27.16875	
10:06:54	251		28.2375	
10:07:24	258.7		29.10375	
10:07:54	265.8		29.9025	
10:08:24	275.5		30.99375	
10:08:54	287.7		32.36625	
10:09:24	302		33.975	
10:09:54	317.3		35.69625	
10:10:24	340.6		38.3175	
10:10:54	370.4		41.67	
10:11:24	354.1		39.83625	
10:11:54	368		41.4	
10:12:24	403.3		45.37125	
10:12:54	436.3		49.08375	
10:13:24	438.2		49.2975	
10:13:54	505		56.8125	
10:14:24	436.7		49.12875	
10:14:54	428.7		48.22875	
10:15:24	434.2		48.8475	
10:15:54	430.6		48.4425	
10:16:24	495.6		55.755	
10:16:54	477.4		53.7075	
10:17:24	456.7		51.37875	
10:17:54	396		44.55	
10:18:24	382.3		43.00875	
10:18:54	373.4		42.0075	

10:19:24	369.3		41.54625	
10:19:54	365.9		41.16375	
10:20:24	365.6		41.13	
10:20:54	368.6		41.4675	
10:21:24	373.1		41.97375	
10:21:54	379.4		42.6825	
10:22:24	386.1		43.43625	
10:22:54	396		44.55	
10:23:24	405.8		45.6525	
10:23:54	412.5		46.40625	
10:24:24	423.4		47.6325	
10:24:54	421.4		47.4075	
10:25:24	423.6		47.655	
10:25:54	419.8		47.2275	
10:26:24	419.8		47.2275	
10:26:54	417.6		46.98	
10:27:24	410.3		46.15875	
10:27:54	406		45.675	
10:28:24	406		45.675	
10:28:54	413.9		46.56375	
10:29:24	427.5		48.09375	
10:29:54	432.6		48.6675	
10:30:24	441.8		49.7025	
10:30:54	451.8		50.8275	
10:31:24	457.3		51.44625	
10:31:54	461.9		51.96375	
10:32:24	472		53.1	
10:32:54	475.7		53.51625	
10:33:24	478.1		53.78625	
10:33:54	477.6		53.73	
10:34:24	480.8		54.09	
10:34:54	484.9		54.55125	
10:35:24	491.4		55.2825	
10:35:54	476.3		53.58375	
10:36:24	473.8		53.3025	
10:36:54	469.4		52.8075	
10:37:24	464.1		52.21125	
10:37:54	461.9		51.96375	
10:38:24	456.4		51.345	
10:38:54	451.6		50.805	
10:39:24	453.2		50.985	
10:39:54	454.3		51.10875	



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10:40:24	447.2	50.31	
10:40:54	447	50.2875	
10:41:24	448.3	50.43375	
10:41:54	442.9	49.82625	
10:42:24	433.9	48.81375	
10:42:54	427.4	48.0825	
10:43:24	403.6	45.405	
10:43:54	385.4	43.3575	
10:44:24	373.2	41.985	
10:44:54	367	41.2875	
10:45:24	375.1	42.19875	
10:45:54	404.7	45.52875	
10:46:24	456.1	51.31125	
10:46:54	461.3	51.89625	
10:47:24	480.6	54.0675	
10:47:54	490.4	55.17	
10:48:24	491.2	55.26	
10:48:54	483.9	54.43875	
10:49:24	480.1	54.01125	
10:49:54	476.8	53.64	
10:50:24	473.2	53.235	
10:50:54	482.7	54.30375	
10:51:24	502.1	56.48625	
10:51:54	518.3	58.30875	
10:52:24	537.1	60.42375	
10:52:54	596.1	67.06125	
10:53:24	577.2	64.935	
10:53:54	572.9	64.45125	
10:54:24	624.4	70.245	
10:54:54	652	73.35	
10:55:24	694.7	78.15375	
10:55:54	568.2	63.9225	
10:56:24	581.8	65.4525	
10:56:54	620.3	69.78375	
10:57:24	633	71.2125	
10:57:54	600.8	67.59	
10:58:24	564.7	63.52875	
10:58:54	558.8	62.865	
10:59:24	592.4	66.645	
10:59:54	586.5	65.98125	
11:00:24	585	65.8125	
11:00:54	749.2	84.285	



11:01:24	636	71.55	
11:01:54	612.5	68.90625	
11:02:24	719.1	80.89875	
11:02:54	862.9	97.07625	
11:03:24	825.2	92.835	
11:03:54	883.5	99.39375	
11:04:24	1005	113.0625	
11:04:54	724.5	81.50625	
11:05:24	957	107.6625	
11:05:54	784.4	88.245	
11:06:24	764.7	86.02875	
11:06:54	795.3	89.47125	
11:07:24	1030	115.875	
11:07:54	644.5	72.50625	
11:08:24	628	70.65	
11:08:54	1052	118.35	
11:09:24	629.9	70.86375	
11:09:54	555.2	62.46	
11:10:24	534.3	60.10875	
11:10:54	534.3	60.10875	
11:11:24	496.3	55.83375	
11:11:54	511.3	57.52125	
11:12:24	504.7	56.77875	
11:12:54	511.6	57.555	
11:13:24	494.9	55.67625	
11:13:54	475.7	53.51625	
11:14:24	476	53.55	
11:14:54	498.5	56.08125	
11:15:24	544.6	61.2675	
11:15:54	497.4	55.9575	
11:16:24	496.8	55.89	
11:16:54	537.8	60.5025	
11:17:24	537.8	60.5025	
11:17:54	485.7	54.64125	
11:18:24	465.9	52.41375	
11:18:54	461.6	51.93	
11:19:24	467.3	52.57125	
11:19:54	488.7	54.97875	
11:20:24	537.9	60.51375	
11:20:54	615.8	69.2775	
11:21:24	915.2	102.96	
11:21:54	596.7	67.12875	



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11:22:24	548.9		61.75125	
11:22:54	571.3		64.27125	
11:23:24	652.9		73.45125	
11:23:54	558.2		62.7975	
11:24:24	536.5		60.35625	
11:24:54	520.8		58.59	
11:25:24	540.1		60.76125	
11:25:54	621.1		69.87375	
11:26:24	542.7		61.05375	
11:26:54	556		62.55	
11:27:24	1149		129.2625	
11:27:54	676.3		76.08375	
11:28:24	723.7		81.41625	
11:28:54	974.4		109.62	
11:29:24	678.2		76.2975	
11:29:54	645.1		72.57375	
11:30:24	687.7		77.36625	
11:30:54	799.1		89.89875	
11:31:24	913.1		102.72375	
11:31:54	702.2		78.9975	
11:32:24	966		108.675	
11:32:54	855.8		96.2775	
11:33:24	883.8		99.4275	
11:33:54	588.3		66.18375	
11:34:24	556.6		62.6175	
11:34:54	607.3		68.32125	
11:35:24	641.8		72.2025	
11:35:54	1132		127.35	
11:36:24	1148		129.15	
11:36:54	1029		115.7625	
11:37:24	1169		131.5125	
11:37:54	548.5		61.70625	
11:38:24	486		54.675	
11:38:54	790.5		88.93125	
11:39:24	967.1		108.79875	
11:39:54	1148		129.15	
11:40:24	851		95.7375	
11:40:54	901.7		101.44125	
11:41:24	967.6		108.855	
11:41:54	988.5		111.20625	
11:42:24	1040		117	
11:42:54	711		79.9875	

11:43:24	861	96.8625	
11:43:54	753.2	84.735	
11:44:24	991.5	111.54375	
11:44:54	1100	123.75	
11:45:24	986.3	110.95875	
11:45:54	625.8	70.4025	
11:46:24	834.7	93.90375	
11:46:54	981.4	110.4075	
11:47:24	839.9	94.48875	
11:47:54	983.9	110.68875	
11:48:24	987.2	111.06	
11:48:54	1006	113.175	
11:49:24	875.1	98.44875	
11:49:54	762.8	85.815	
11:50:24	1032	116.1	
11:50:54	1023	115.0875	
11:51:24	980.7	110.32875	
11:51:54	949.1	106.77375	
11:52:24	1007	113.2875	
11:52:54	948.6	106.7175	
11:53:24	995.5	111.99375	
11:53:54	992	111.6	
11:54:24	987.5	111.09375	
11:54:54	985.6	110.88	
11:55:24	958.7	107.85375	
11:55:54	970.8	109.215	
11:56:24	964.1	108.46125	
11:56:54	953.8	107.3025	
11:57:24	950.6	106.9425	
11:57:54	951.6	107.055	
11:58:24	947.5	106.59375	
11:58:54	955.7	107.51625	
11:59:24	959.5	107.94375	
11:59:54	917.2	103.185	
12:00:24	925.1	104.07375	
12:00:54	981	110.3625	
12:01:24	876.1	98.56125	
12:01:54	756	85.05	
12:02:24	933.5	105.01875	
12:02:54	969.5	109.06875	
12:03:24	916.3	103.08375	
12:03:54	785.8	88.4025	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:04:24	1019		114.6375	
12:04:54	832		93.6	
12:05:24	884		99.45	
12:05:54	1033		116.2125	
12:06:24	1022		114.975	
12:06:54	909.3		102.29625	
12:07:24	883.2		99.36	
12:07:54	801.3		90.14625	
12:08:24	916.8		103.14	
12:08:54	962.5		108.28125	
12:09:24	947.6		106.605	
12:09:54	944.5		106.25625	
12:10:24	908.7		102.22875	
12:10:54	934		105.075	
12:11:24	917.7		103.24125	
12:11:54	935.4		105.2325	
12:12:24	925.8		104.1525	
12:12:54	876.8		98.64	
12:13:24	859.7		96.71625	
12:13:54	955.9		107.53875	
12:14:24	904.6		101.7675	
12:14:54	808.4		90.945	
12:15:24	860.4		96.795	
12:15:54	930.1		104.63625	
12:16:24	923.4		103.8825	
12:16:54	926.7		104.25375	
12:17:24	924.4		103.995	
12:17:54	914.2		102.8475	
12:18:24	915.6		103.005	
12:18:54	914.4		102.87	
12:19:24	918		103.275	
12:19:54	915.3		102.97125	
12:20:24	912.2		102.6225	
12:20:54	910.7		102.45375	
12:21:24	912.8		102.69	
12:21:54	911.8		102.5775	
12:22:24	921.5		103.66875	
12:22:54	866.1		97.43625	
12:23:24	871.3		98.02125	
12:23:54	870.2		97.8975	
12:24:24	886.3		99.70875	
12:24:54	881		99.1125	

12:25:24	911.2	102.51	
12:25:54	912.6	102.6675	
12:26:24	908.5	102.20625	
12:26:54	912.8	102.69	
12:27:24	906.8	102.015	
12:27:54	904.2	101.7225	
12:28:24	905.5	101.86875	
12:28:54	909.5	102.31875	
12:29:24	912.5	102.65625	
12:29:54	914.5	102.88125	
12:30:24	915.3	102.97125	
12:30:54	914.4	102.87	
12:31:24	913.3	102.74625	
12:31:54	913	102.7125	
12:32:24	913.4	102.7575	
12:32:54	915	102.9375	
12:33:24	912.5	102.65625	
12:33:54	913.4	102.7575	
12:34:24	910.9	102.47625	
12:34:54	911	102.4875	
12:35:24	912.5	102.65625	
12:35:54	902.7	101.55375	
12:36:24	912	102.6	
12:36:54	914.4	102.87	
12:37:24	911.8	102.5775	
12:37:54	910.4	102.42	
12:38:24	917.9	103.26375	
12:38:54	917.2	103.185	
12:39:24	923.4	103.8825	
12:39:54	931.6	104.805	
12:40:24	931.6	104.805	
12:40:54	941.9	105.96375	
12:41:24	943.4	106.1325	
12:41:54	946	106.425	
12:42:24	956.5	107.60625	
12:42:54	957.6	107.73	
12:43:24	962.8	108.315	
12:43:54	960.1	108.01125	
12:44:24	992.5	111.65625	
12:44:54	998.6	112.3425	
12:45:24	1005	113.0625	
12:45:54	1019	114.6375	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:46:24	1006		113.175	
12:46:54	990.1		111.38625	
12:47:24	965.1		108.57375	
12:47:54	945.7		106.39125	
12:48:24	938		105.525	
12:48:54	954.4		107.37	
12:49:24	948.9		106.75125	
12:49:54	920.7		103.57875	
12:50:24	809.9		91.11375	
12:50:54	737.6		82.98	
12:51:24	695		78.1875	
12:51:54	686.8		77.265	
12:52:24	602.1		67.73625	
12:52:54	584.2		65.7225	
12:53:24	648.2		72.9225	
12:53:54	699.3		78.67125	
12:54:24	664.9		74.80125	
12:54:54	695.3		78.22125	
12:55:24	678.4		76.32	
12:55:54	677		76.1625	
12:56:24	742.9		83.57625	
12:56:54	647.5		72.84375	
12:57:24	637.2		71.685	
12:57:54	603.3		67.87125	
12:58:24	594.3		66.85875	
12:58:54	569.3		64.04625	
12:59:24	437.4		49.2075	
12:59:54	398.1		44.78625	
13:00:24	368.6		41.4675	
13:00:54	368.2		41.4225	
13:01:24	381		42.8625	
13:01:54	404.9		45.55125	
13:02:24	429.6		48.33	
13:02:54	439.9		49.48875	
13:03:24	439.7		49.46625	
13:03:54	442.7		49.80375	
13:04:24	455.6		51.255	
13:04:54	467.9		52.63875	
13:05:24	483		54.3375	
13:05:54	486.9		54.77625	
13:06:24	490.6		55.1925	
13:06:54	489.5		55.06875	

13:07:24	488.4		54.945	
13:07:54	483.6		54.405	
13:08:24	475.4		53.4825	
13:08:54	467.3		52.57125	
13:09:24	460.6		51.8175	
13:09:54	454.8		51.165	
13:10:24	448.1		50.41125	
13:10:54	442.6		49.7925	
13:11:24	446.2		50.1975	
13:11:54	470.1		52.88625	
13:12:24	577		64.9125	
13:12:54	652.4		73.395	
13:13:24	614.4		69.12	
13:13:54	592.6		66.6675	
13:14:24	782.9		88.07625	
13:14:54	906		101.925	
13:15:24	739.1		83.14875	
13:15:54	998.6		112.3425	
13:16:24	856.9		96.40125	
13:16:54	738.7		83.10375	
13:17:24	908.2		102.1725	
13:17:54	727.7		81.86625	
13:18:24	712.5		80.15625	
13:18:54	461.6		51.93	
13:19:24	445.1		50.07375	
13:19:54	453.4		51.0075	
13:20:24	429.9		48.36375	
13:20:54	412.3		46.38375	
13:21:24	410.1		46.13625	
13:21:54	414.1		46.58625	
13:22:24	422.3		47.50875	
13:22:54	415.8		46.7775	
13:23:24	393.5		44.26875	
13:23:54	380		42.75	
13:24:24	378.6		42.5925	
13:24:54	375.4		42.2325	
13:25:24	372		41.85	
13:25:54	382.7		43.05375	
13:26:24	423.6		47.655	
13:26:54	402.8		45.315	
13:27:24	399.8		44.9775	
13:27:54	405.4		45.6075	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

13:28:24	410	46.125	
13:28:54	425	47.8125	
13:29:24	424.7	47.77875	
13:29:54	406.2	45.6975	
13:30:24	397.1	44.67375	
13:30:54	392.9	44.20125	
13:31:24	389.1	43.77375	
13:31:54	387	43.5375	
13:32:24	387.2	43.56	
13:32:54	392.1	44.11125	
13:33:24	399.8	44.9775	
13:33:54	407.9	45.88875	
13:34:24	415.7	46.76625	
13:34:54	423	47.5875	
13:35:24	432.5	48.65625	
13:35:54	429	48.2625	
13:36:24	419	47.1375	
13:36:54	409.2	46.035	
13:37:24	400.1	45.01125	
13:37:54	392.9	44.20125	
13:38:24	379.9	42.73875	
13:38:54	371	41.7375	
13:39:24	363.2	40.86	
13:39:54	354.2	39.8475	
13:40:24	350.7	39.45375	
13:40:54	351.1	39.49875	
13:41:24	355.8	40.0275	
13:41:54	365.3	41.09625	
13:42:24	407.4	45.8325	
13:42:54	409.3	46.04625	
13:43:24	415.4	46.7325	
13:43:54	410.3	46.15875	
13:44:24	406.2	45.6975	
13:44:54	403.3	45.37125	
13:45:24	398.7	44.85375	
13:45:54	395.6	44.505	
13:46:24	390.3	43.90875	
13:46:54	383.2	43.11	
13:47:24	372.7	41.92875	
13:47:54	362.9	40.82625	
13:48:24	345.7	38.89125	
13:48:54	331.6	37.305	



13:49:24	322.4		36.27	
13:49:54	320		36	
13:50:24	318		35.775	
13:50:54	319.4		35.9325	
13:51:24	324.4		36.495	
13:51:54	328.9		37.00125	
13:52:24	332.5		37.40625	
13:52:54	335.5		37.74375	
13:53:24	338.2		38.0475	
13:53:54	344.1		38.71125	
13:54:24	350.4		39.42	
13:54:54	356		40.05	
13:55:24	360.9		40.60125	
13:55:54	365		41.0625	
13:56:24	368.9		41.50125	
13:56:54	371		41.7375	
13:57:24	370.4		41.67	
13:57:54	366.9		41.27625	
13:58:24	359.6		40.455	
13:58:54	349.2		39.285	
13:59:24	335.8		37.7775	
13:59:54	323.2		36.36	
14:00:24	312.4		35.145	
14:00:54	304.7		34.27875	
14:01:24	300.2		33.7725	
14:01:54	298.3		33.55875	
14:02:24	301.2		33.885	
14:02:54	305.6		34.38	
14:03:24	310.5		34.93125	
14:03:54	315.1		35.44875	
14:04:24	318		35.775	
14:04:54	319.7		35.96625	
14:05:24	320.2		36.0225	
14:05:54	321		36.1125	
14:06:24	322.5		36.28125	
14:06:54	325.7		36.64125	
14:07:24	328.6		36.9675	
14:07:54	330.3		37.15875	
14:08:24	331.6		37.305	
14:08:54	332.5		37.40625	
14:09:24	331.7		37.31625	
14:09:54	330.3		37.15875	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

14:10:24	329.2		37.035	
14:10:54	328.6		36.9675	
14:11:24	327.6		36.855	
14:11:54	327.5		36.84375	
14:12:24	327.9		36.88875	
14:12:54	330.5		37.18125	
14:13:24	333.5		37.51875	
14:13:54	337.1		37.92375	
14:14:24	341.7		38.44125	
14:14:54	348.7		39.22875	
14:15:24	357.7		40.24125	
14:15:54	369.6		41.58	
14:16:24	386.2		43.4475	
<b>Average</b>	<b>599.8</b>		<b>67.47984698</b>	

**Appendix Table 3, Daily solar irradiance 20 June 2019**

Site Name:	Lapangan Pemuda	Date:	20/06/2019	Equipment:
Location:	Lat: -6.118406	Long: 120.457592		
Elevation:	+ 1 meter	Time Zone:	WITA	

Time	Solar irradiance (W/m2)	Air Temperature (degree C)	PV Power output (W/m2)	Remark
09:00:22	248.3		27.93375	
09:00:52	285.6		32.13	
09:01:22	489.9		55.11375	
09:01:52	395.4		44.4825	
09:02:22	465.2		52.335	
09:02:52	658.9		74.12625	
09:03:22	454.5		51.13125	
09:03:52	747		84.0375	
09:04:22	441		49.6125	
09:04:52	325.2		36.585	
09:05:22	599.5		67.44375	
09:05:52	310.4		34.92	
09:06:22	298		33.525	
09:06:52	313.4		35.2575	
09:07:22	318.9		35.87625	
09:07:52	321.3		36.14625	
09:08:22	328.7		36.97875	
09:08:52	469.4		52.8075	
09:09:22	738.9		83.12625	
09:09:52	753.8		84.8025	
09:10:22	525.3		59.09625	
09:10:52	460.5		51.80625	
09:11:22	730.3		82.15875	
09:11:52	553.3		62.24625	
09:12:22	814		91.575	
09:12:52	453.5		51.01875	
09:13:22	358.7		40.35375	
09:13:52	307		34.5375	
09:14:22	413.9		46.56375	
09:14:52	368.6		41.4675	
09:15:22	357.1		40.17375	
09:15:52	570.4		64.17	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

09:16:22	639		71.8875	
09:16:52	744.9		83.80125	
09:17:22	572		64.35	
09:17:52	769.3		86.54625	
09:18:22	560.7		63.07875	
09:18:52	471.9		53.08875	
09:19:22	360.6		40.5675	
09:19:52	457.3		51.44625	
09:20:22	313		35.2125	
09:20:52	336		37.8	
09:21:22	909.1		102.27375	
09:21:52	584.8		65.79	
09:22:22	528.4		59.445	
09:22:52	406.6		45.7425	
09:23:22	474.9		53.42625	
09:23:52	505		56.8125	
09:24:22	573.4		64.5075	
09:24:52	666.2		74.9475	
09:25:22	564.1		63.46125	
09:25:52	475.7		53.51625	
09:26:22	475.7		53.51625	
09:26:52	475.5		53.49375	
09:27:22	382.7		43.05375	
09:27:52	489.8		55.1025	
09:28:22	540.5		60.80625	
09:28:52	518.9		58.37625	
09:29:22	474.3		53.35875	
09:29:52	681.9		76.71375	
09:30:22	847.2		95.31	
09:30:52	652.7		73.42875	
09:31:22	645.8		72.6525	
09:31:52	742.7		83.55375	
09:32:22	906.3		101.95875	
09:32:52	349.3		39.29625	
09:33:22	337		37.9125	
09:33:52	287.4		32.3325	
09:34:22	372.3		41.88375	
09:34:52	718.5		80.83125	
09:35:22	365.9		41.16375	
09:35:52	861.2		96.885	
09:36:22	400.6		45.0675	
09:36:52	538.4		60.57	

09:37:22	565.2		63.585	
09:37:52	477.3		53.69625	
09:38:22	365.6		41.13	
09:38:52	325.6		36.63	
09:39:22	428.3		48.18375	
09:39:52	528.9		59.50125	
09:40:22	782.5		88.03125	
09:40:52	831.4		93.5325	
09:41:22	822		92.475	
09:41:52	797.7		89.74125	
09:42:22	748.1		84.16125	
09:42:52	817.8		92.0025	
09:43:22	760.4		85.545	
09:43:52	735.3		82.72125	
09:44:22	818.4		92.07	
09:44:52	833.8		93.8025	
09:45:22	788.3		88.68375	
09:45:52	679.7		76.46625	
09:46:22	719.3		80.92125	
09:46:52	778.8		87.615	
09:47:22	825.7		92.89125	
09:47:52	825.4		92.8575	
09:48:22	830		93.375	
09:48:52	817		91.9125	
09:49:22	787.8		88.6275	
09:49:52	661.6		74.43	
09:50:22	517.5		58.21875	
09:50:52	550.3		61.90875	
09:51:22	813.8		91.5525	
09:51:52	575.9		64.78875	
09:52:22	519.9		58.48875	
09:52:52	572.8		64.44	
09:53:22	741		83.3625	
09:53:52	743		83.5875	
09:54:22	845.6		95.13	
09:54:52	865		97.3125	
09:55:22	784.5		88.25625	
09:55:52	710.2		79.8975	
09:56:22	776.1		87.31125	
09:56:52	879.4		98.9325	
09:57:22	849.6		95.58	
09:57:52	894.1		100.58625	



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09:58:22	796.1		89.56125	
09:58:52	605.6		68.13	
09:59:22	462.7		52.05375	
09:59:52	872.9		98.20125	
10:00:22	737		82.9125	
10:00:52	825.5		92.86875	
10:01:22	793.5		89.26875	
10:01:52	712.3		80.13375	
10:02:22	574.4		64.62	
10:02:52	550.3		61.90875	
10:03:22	752.5		84.65625	
10:03:52	639.8		71.9775	
10:04:22	776.8		87.39	
10:04:52	539.5		60.69375	
10:05:22	763		85.8375	
10:05:52	878		98.775	
10:06:22	862.7		97.05375	
10:06:52	812.4		91.395	
10:07:22	795.6		89.505	
10:07:52	854.7		96.15375	
10:08:22	856.4		96.345	
10:08:52	856.3		96.33375	
10:09:22	855.3		96.22125	
10:09:52	852.8		95.94	
10:10:22	847.5		95.34375	
10:10:52	854.5		96.13125	
10:11:22	849.9		95.61375	
10:11:52	847.5		95.34375	
10:12:22	850.9		95.72625	
10:12:52	846.9		95.27625	
10:13:22	844.1		94.96125	
10:13:52	840.9		94.60125	
10:14:22	842.8		94.815	
10:14:52	838.4		94.32	
10:15:22	835.5		93.99375	
10:15:52	836		94.05	
10:16:22	838.8		94.365	
10:16:52	837.4		94.2075	
10:17:22	834.7		93.90375	
10:17:52	834.4		93.87	
10:18:22	841.4		94.6575	
10:18:52	835.7		94.01625	

10:19:22	722		81.225	
10:19:52	842.6		94.7925	
10:20:22	847.2		95.31	
10:20:52	843		94.8375	
10:21:22	843.9		94.93875	
10:21:52	848.2		95.4225	
10:22:22	846.4		95.22	
10:22:52	846.4		95.22	
10:23:22	843.1		94.84875	
10:23:52	847.1		95.29875	
10:24:22	846.6		95.2425	
10:24:52	847.5		95.34375	
10:25:22	838.7		94.35375	
10:25:52	845.2		95.085	
10:26:22	850.6		95.6925	
10:26:52	852.6		95.9175	
10:27:22	849.3		95.54625	
10:27:52	851.2		95.76	
10:28:22	850.2		95.6475	
10:28:52	851.7		95.81625	
10:29:22	851.3		95.77125	
10:29:52	853.6		96.03	
10:30:22	854.2		96.0975	
10:30:52	855		96.1875	
10:31:22	853.4		96.0075	
10:31:52	861.5		96.91875	
10:32:22	863.4		97.1325	
10:32:52	862.4		97.02	
10:33:22	859.3		96.67125	
10:33:52	861		96.8625	
10:34:22	865.1		97.32375	
10:34:52	862.4		97.02	
10:35:22	858.6		96.5925	
10:35:52	854.5		96.13125	
10:36:22	859.7		96.71625	
10:36:52	861.6		96.93	
10:37:22	866.2		97.4475	
10:37:52	868.9		97.75125	
10:38:22	869.6		97.83	
10:38:52	876.2		98.5725	
10:39:22	874.3		98.35875	
10:39:52	876.7		98.62875	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

10:40:22	881		99.1125	
10:40:52	881.8		99.2025	
10:41:22	877.5		98.71875	
10:41:52	877.8		98.7525	
10:42:22	879.9		98.98875	
10:42:52	876.7		98.62875	
10:43:22	879.5		98.94375	
10:43:52	880.6		99.0675	
10:44:22	884.9		99.55125	
10:44:52	883		99.3375	
10:45:22	881.9		99.21375	
10:45:52	886.2		99.6975	
10:46:22	887.5		99.84375	
10:46:52	884.4		99.495	
10:47:22	881.9		99.21375	
10:47:52	883.8		99.4275	
10:48:22	881.3		99.14625	
10:48:52	883.5		99.39375	
10:49:22	885.6		99.63	
10:49:52	885.7		99.64125	
10:50:22	889		100.0125	
10:50:52	887.3		99.82125	
10:51:22	891.9		100.33875	
10:51:52	893.5		100.51875	
10:52:22	890.1		100.13625	
10:52:52	886.7		99.75375	
10:53:22	884.8		99.54	
10:53:52	888.2		99.9225	
10:54:22	892.2		100.3725	
10:54:52	890.3		100.15875	
10:55:22	887.9		99.88875	
10:55:52	889		100.0125	
10:56:22	894.1		100.58625	
10:56:52	890		100.125	
10:57:22	892.4		100.395	
10:57:52	888.9		100.00125	
10:58:22	893.6		100.53	
10:58:52	895.4		100.7325	
10:59:22	899.3		101.17125	
10:59:52	896.6		100.8675	
11:00:22	897		100.9125	
11:00:52	898.9		101.12625	



11:01:22	899.6		101.205	
11:01:52	896.3		100.83375	
11:02:22	902		101.475	
11:02:52	903.8		101.6775	
11:03:22	903.3		101.62125	
11:03:52	903.4		101.6325	
11:04:22	902.8		101.565	
11:04:52	906		101.925	
11:05:22	904.1		101.71125	
11:05:52	906.1		101.93625	
11:06:22	907.7		102.11625	
11:06:52	901.9		101.46375	
11:07:22	905		101.8125	
11:07:52	904.9		101.80125	
11:08:22	906.5		101.98125	
11:08:52	906.1		101.93625	
11:09:22	905.5		101.86875	
11:09:52	904.4		101.745	
11:10:22	903.8		101.6775	
11:10:52	904.4		101.745	
11:11:22	908.5		102.20625	
11:11:52	914.7		102.90375	
11:12:22	915.5		102.99375	
11:12:52	917.2		103.185	
11:13:22	915.8		103.0275	
11:13:52	918.5		103.33125	
11:14:22	916.1		103.06125	
11:14:52	917.5		103.21875	
11:15:22	916.1		103.06125	
11:15:52	918		103.275	
11:16:22	918.2		103.2975	
11:16:52	916		103.05	
11:17:22	922.9		103.82625	
11:17:52	919.8		103.4775	
11:18:22	918.3		103.30875	
11:18:52	918.7		103.35375	
11:19:22	919		103.3875	
11:19:52	919.8		103.4775	
11:20:22	919.4		103.4325	
11:20:52	914.9		102.92625	
11:21:22	916.9		103.15125	
11:21:52	916.9		103.15125	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

11:22:22	918.2		103.2975	
11:22:52	920.7		103.57875	
11:23:22	922.8		103.815	
11:23:52	923.6		103.905	
11:24:22	924		103.95	
11:24:52	920.6		103.5675	
11:25:22	921.3		103.64625	
11:25:52	921.7		103.69125	
11:26:22	918.5		103.33125	
11:26:52	921.8		103.7025	
11:27:22	923.7		103.91625	
11:27:52	922.6		103.7925	
11:28:22	924.2		103.9725	
11:28:52	925.1		104.07375	
11:29:22	924.7		104.02875	
11:29:52	922.5		103.78125	
11:30:22	925.1		104.07375	
11:30:52	925		104.0625	
11:31:22	927.7		104.36625	
11:31:52	930.2		104.6475	
11:32:22	926.3		104.20875	
11:32:52	924.2		103.9725	
11:33:22	925.3		104.09625	
11:33:52	924		103.95	
11:34:22	926.1		104.18625	
11:34:52	922.6		103.7925	
11:35:22	922.6		103.7925	
11:35:52	923.4		103.8825	
11:36:22	926.6		104.2425	
11:36:52	929.3		104.54625	
11:37:22	929.3		104.54625	
11:37:52	932.1		104.86125	
11:38:22	932.3		104.88375	
11:38:52	930.7		104.70375	
11:39:22	933.2		104.985	
11:39:52	931.3		104.77125	
11:40:22	932.4		104.895	
11:40:52	933.2		104.985	
11:41:22	927.7		104.36625	
11:41:52	930.1		104.63625	
11:42:22	929.3		104.54625	
11:42:52	928		104.4	

11:43:22	930.7		104.70375	
11:43:52	934.2		105.0975	
11:44:22	935.3		105.22125	
11:44:52	933.4		105.0075	
11:45:22	937.7		105.49125	
11:45:52	935.1		105.19875	
11:46:22	933.4		105.0075	
11:46:52	934.3		105.10875	
11:47:22	934.6		105.1425	
11:47:52	930.8		104.715	
11:48:22	927.7		104.36625	
11:48:52	930.8		104.715	
11:49:22	931.8		104.8275	
11:49:52	928		104.4	
11:50:22	932.9		104.95125	
11:50:52	933.1		104.97375	
11:51:22	932.9		104.95125	
11:51:52	934		105.075	
11:52:22	932.4		104.895	
11:52:52	931.5		104.79375	
11:53:22	933.4		105.0075	
11:53:52	927.4		104.3325	
11:54:22	931.5		104.79375	
11:54:52	933.2		104.985	
11:55:22	935.3		105.22125	
11:55:52	934.8		105.165	
11:56:22	934.2		105.0975	
11:56:52	932.7		104.92875	
11:57:22	932.6		104.9175	
11:57:52	935		105.1875	
11:58:22	932.1		104.86125	
11:58:52	932.9		104.95125	
11:59:22	932.3		104.88375	
11:59:52	932.6		104.9175	
12:00:22	934.2		105.0975	
12:00:52	932.9		104.95125	
12:01:22	932.4		104.895	
12:01:52	930.4		104.67	
12:02:22	930.5		104.68125	
12:02:52	929.4		104.5575	
12:03:22	934.3		105.10875	
12:03:52	934.8		105.165	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:04:22	931.8	104.8275	
12:04:52	931	104.7375	
12:05:22	932.7	104.92875	
12:05:52	932.7	104.92875	
12:06:22	933.4	105.0075	
12:06:52	930.8	104.715	
12:07:22	927.5	104.34375	
12:07:52	931.8	104.8275	
12:08:22	930.4	104.67	
12:08:52	930.7	104.70375	
12:09:22	934	105.075	
12:09:52	932.6	104.9175	
12:10:22	930.7	104.70375	
12:10:52	931	104.7375	
12:11:22	930.8	104.715	
12:11:52	931.5	104.79375	
12:12:22	930.5	104.68125	
12:12:52	931	104.7375	
12:13:22	927.4	104.3325	
12:13:52	928.2	104.4225	
12:14:22	930.5	104.68125	
12:14:52	930.2	104.6475	
12:15:22	926.6	104.2425	
12:15:52	927.5	104.34375	
12:16:22	927.5	104.34375	
12:16:52	926.9	104.27625	
12:17:22	923.4	103.8825	
12:17:52	922.9	103.82625	
12:18:22	923.1	103.84875	
12:18:52	922.9	103.82625	
12:19:22	923.9	103.93875	
12:19:52	923.7	103.91625	
12:20:22	924.4	103.995	
12:20:52	925.3	104.09625	
12:21:22	919.1	103.39875	
12:21:52	922.9	103.82625	
12:22:22	925	104.0625	
12:22:52	922.8	103.815	
12:23:22	922	103.725	
12:23:52	922.1	103.73625	
12:24:22	922.6	103.7925	
12:24:52	921.7	103.69125	

12:25:22	921.2		103.635	
12:25:52	918.8		103.365	
12:26:22	921		103.6125	
12:26:52	916.6		103.1175	
12:27:22	918		103.275	
12:27:52	917.1		103.17375	
12:28:22	913.7		102.79125	
12:28:52	916.4		103.095	
12:29:22	916.1		103.06125	
12:29:52	915.2		102.96	
12:30:22	915.5		102.99375	
12:30:52	917.1		103.17375	
12:31:22	917.1		103.17375	
12:31:52	915.3		102.97125	
12:32:22	913.3		102.74625	
12:32:52	918.2		103.2975	
12:33:22	917.5		103.21875	
12:33:52	917.5		103.21875	
12:34:22	917.7		103.24125	
12:34:52	918.7		103.35375	
12:35:22	916.6		103.1175	
12:35:52	916.6		103.1175	
12:36:22	917.1		103.17375	
12:36:52	915.6		103.005	
12:37:22	914.2		102.8475	
12:37:52	909.9		102.36375	
12:38:22	909.1		102.27375	
12:38:52	909.3		102.29625	
12:39:22	905.5		101.86875	
12:39:52	907.9		102.13875	
12:40:22	909.8		102.3525	
12:40:52	906.8		102.015	
12:41:22	905.5		101.86875	
12:41:52	909		102.2625	
12:42:22	907.4		102.0825	
12:42:52	905.8		101.9025	
12:43:22	909.6		102.33	
12:43:52	908		102.15	
12:44:22	910.3		102.40875	
12:44:52	906.5		101.98125	
12:45:22	910.3		102.40875	
12:45:52	908.8		102.24	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:46:22	910.7		102.45375	
12:46:52	910.4		102.42	
12:47:22	906.5		101.98125	
12:47:52	901.5		101.41875	
12:48:22	906.8		102.015	
12:48:52	906.8		102.015	
12:49:22	905		101.8125	
12:49:52	901.9		101.46375	
12:50:22	901.7		101.44125	
12:50:52	900.4		101.295	
12:51:22	899		101.1375	
12:51:52	894.9		100.67625	
12:52:22	895.4		100.7325	
12:52:52	899.3		101.17125	
12:53:22	895.7		100.76625	
12:53:52	897.3		100.94625	
12:54:22	893.2		100.485	
12:54:52	894.6		100.6425	
12:55:22	893.9		100.56375	
12:55:52	891.1		100.24875	
12:56:22	892.7		100.42875	
12:56:52	892.2		100.3725	
12:57:22	893.3		100.49625	
12:57:52	893.9		100.56375	
12:58:22	890.9		100.22625	
12:58:52	896.2		100.8225	
12:59:22	894.9		100.67625	
12:59:52	891.7		100.31625	
13:00:22	890.8		100.215	
13:00:52	889		100.0125	
13:01:22	888.7		99.97875	
13:01:52	888.9		100.00125	
13:02:22	884.8		99.54	
13:02:52	883.8		99.4275	
13:03:22	870.3		97.90875	
13:03:52	880.2		99.0225	
13:04:22	878.3		98.80875	
13:04:52	882.4		99.27	
13:05:22	874.3		98.35875	
13:05:52	872.1		98.11125	
13:06:22	872.1		98.11125	
13:06:52	868.9		97.75125	

13:07:22	872.7		98.17875	
13:07:52	870.8		97.965	
13:08:22	864.6		97.2675	
13:08:52	867.3		97.57125	
13:09:22	870.7		97.95375	
13:09:52	873.2		98.235	
13:10:22	873		98.2125	
13:10:52	868.3		97.68375	
13:11:22	871.5		98.04375	
13:11:52	873.4		98.2575	
13:12:22	867.5		97.59375	
13:12:52	872.4		98.145	
13:13:22	862.7		97.05375	
13:13:52	858.8		96.615	
13:14:22	860.8		96.84	
13:14:52	858.5		96.58125	
13:15:22	852		95.85	
13:15:52	845		95.0625	
13:16:22	846.6		95.2425	
13:16:52	850.4		95.67	
13:17:22	842.3		94.75875	
13:17:52	841.5		94.66875	
13:18:22	841.8		94.7025	
13:18:52	839.9		94.48875	
13:19:22	839.8		94.4775	
13:19:52	837.4		94.2075	
13:20:22	841.1		94.62375	
13:20:52	843.9		94.93875	
13:21:22	842.5		94.78125	
13:21:52	843.9		94.93875	
13:22:22	838.5		94.33125	
13:22:52	830.4		93.42	
13:23:22	843.9		94.93875	
13:23:52	843.6		94.905	
13:24:22	845.2		95.085	
13:24:52	843.4		94.8825	
13:25:22	839.9		94.48875	
13:25:52	833.4		93.7575	
13:26:22	832.8		93.69	
13:26:52	833.6		93.78	
13:27:22	830.3		93.40875	
13:27:52	826.8		93.015	



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13:28:22	826.6		92.9925	
13:28:52	824.7		92.77875	
13:29:22	823.3		92.62125	
13:29:52	815.2		91.71	
13:30:22	813		91.4625	
13:30:52	812.9		91.45125	
13:31:22	811.8		91.3275	
Average	<b>822.5</b>		<b>92.5391</b>	



**Appendix Table 4, Daily solar irradiance 21 June 2019**

Site Name:	Appatana	Date:	21/06/2019	Equipment:
Location:				
	Lat: -6.498358	Long:	120.483450	
Elevation:	+ 1 meter	Time Zone:	WITA	

Time	Solar irradiance (W/m2)	Air Temperature (degree C)	PV Power output (W/m2)	Remark
09:00:25	522.3		58.75875	
09:00:55	523.7		58.91625	
09:01:25	553		62.2125	
09:01:55	548.1		61.66125	
09:02:25	561.2		63.135	
09:02:55	555.2		62.46	
09:03:25	489.2		55.035	
09:03:55	264.1		29.71125	
09:04:25	158		17.775	
09:04:55	156.1		17.56125	
09:05:25	154.5		17.38125	
09:05:55	153.6		17.28	
09:06:25	172.3		19.38375	
09:06:55	186.2		20.9475	
09:07:25	263.2		29.61	
09:07:55	362.9		40.82625	
09:08:25	438.9		49.37625	
09:08:55	325.9		36.66375	
09:09:25	391.8		44.0775	
09:09:55	274.4		30.87	
09:10:25	573.9		64.56375	
09:10:55	643.4		72.3825	
09:11:25	640.7		72.07875	
09:11:55	613.8		69.0525	
09:12:25	615.2		69.21	
09:12:55	606		68.175	
09:13:25	588.1		66.16125	
09:13:55	597.5		67.21875	
09:14:25	593.8		66.8025	
09:14:55	598.1		67.28625	
09:15:25	613		68.9625	
09:15:55	620.3		69.78375	
09:16:25	618.9		69.62625	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

09:16:55	648.2		72.9225	
09:17:25	635.8		71.5275	
09:17:55	602.2		67.7475	
09:18:25	330.5		37.18125	
09:18:55	654.3		73.60875	
09:19:25	611.9		68.83875	
09:19:55	621.2		69.885	
09:20:25	610.6		68.6925	
09:20:55	627.1		70.54875	
09:21:25	622.2		69.9975	
09:21:55	632		71.1	
09:22:25	653.2		73.485	
09:22:55	185.6		20.88	
09:23:25	661.5		74.41875	
09:23:55	703.9		79.18875	
09:24:25	697.6		78.48	
09:24:55	213.9		24.06375	
09:25:25	210.3		23.65875	
09:25:55	332.8		37.44	
09:26:25	232.9		26.20125	
09:26:55	211.5		23.79375	
09:27:25	206.9		23.27625	
09:27:55	514.8		57.915	
09:28:25	310.4		34.92	
09:28:55	832		93.6	
09:29:25	378.3		42.55875	
09:29:55	689.2		77.535	
09:30:25	741.6		83.43	
09:30:55	368.8		41.49	
09:31:25	824.9		92.80125	
09:31:55	367.2		41.31	
09:32:25	742.2		83.4975	
09:32:55	697.1		78.42375	
09:33:25	669.2		75.285	
09:33:55	636.3		71.58375	
09:34:25	650.1		73.13625	
09:34:55	667.6		75.105	
09:35:25	674.3		75.85875	
09:35:55	668.3		75.18375	
09:36:25	666.5		74.98125	
09:36:55	663.4		74.6325	
09:37:25	689.5		77.56875	

09:37:55	726.1		81.68625	
09:38:25	683.8		76.9275	
09:38:55	698.2		78.5475	
09:39:25	696.8		78.39	
09:39:55	363.4		40.8825	
09:40:25	717.7		80.74125	
09:40:55	693		77.9625	
09:41:25	687.1		77.29875	
09:41:55	678.1		76.28625	
09:42:25	670.5		75.43125	
09:42:55	655.4		73.7325	
09:43:25	687.3		77.32125	
09:43:55	682.2		76.7475	
09:44:25	669.7		75.34125	
09:44:55	674		75.825	
09:45:25	394.4		44.37	
09:45:55	686.3		77.20875	
09:46:25	680.6		76.5675	
09:46:55	662.3		74.50875	
09:47:25	659.1		74.14875	
09:47:55	665.1		74.82375	
09:48:25	673		75.7125	
09:48:55	656.2		73.8225	
09:49:25	629.8		70.8525	
09:49:55	642.1		72.23625	
09:50:25	661.5		74.41875	
09:50:55	654.3		73.60875	
09:51:25	661.1		74.37375	
09:51:55	675.1		75.94875	
09:52:25	636.1		71.56125	
09:52:55	545.2		61.335	
09:53:25	659.6		74.205	
09:53:55	661.3		74.39625	
09:54:25	676.5		76.10625	
09:54:55	683.8		76.9275	
09:55:25	672.4		75.645	
09:55:55	694.6		78.1425	
09:56:25	696.8		78.39	
09:56:55	694.1		78.08625	
09:57:25	676.8		76.14	
09:57:55	670		75.375	
09:58:25	676.8		76.14	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

09:58:55	652		73.35	
09:59:25	681.1		76.62375	
09:59:55	673.2		75.735	
10:00:25	698.4		78.57	
10:00:55	688.4		77.445	
10:01:25	237.8		26.7525	
10:01:55	289.9		32.61375	
10:02:25	790.4		88.92	
10:02:55	648.9		73.00125	
10:03:25	767.6		86.355	
10:03:55	776.4		87.345	
10:04:25	772.8		86.94	
10:04:55	759.5		85.44375	
10:05:25	738.9		83.12625	
10:05:55	727		81.7875	
10:06:25	705.6		79.38	
10:06:55	699.8		78.7275	
10:07:25	710.6		79.9425	
10:07:55	720.2		81.0225	
10:08:25	730.2		82.1475	
10:08:55	743		83.5875	
10:09:25	753.2		84.735	
10:09:55	769.2		86.535	
10:10:25	750.3		84.40875	
10:10:55	740.3		83.28375	
10:11:25	712.3		80.13375	
10:11:55	712.1		80.11125	
10:12:25	705.8		79.4025	
10:12:55	687.3		77.32125	
10:13:25	712.6		80.1675	
10:13:55	721.2		81.135	
10:14:25	755.5		84.99375	
10:14:55	825.2		92.835	
10:15:25	443.4		49.8825	
10:15:55	816.3		91.83375	
10:16:25	793.7		89.29125	
10:16:55	811.6		91.305	
10:17:25	373.5		42.01875	
10:17:55	697.9		78.51375	
10:18:25	476.6		53.6175	
10:18:55	208.7		23.47875	
10:19:25	197		22.1625	

10:19:55	267.8		30.1275	
10:20:25	815.6		91.755	
10:20:55	532.7		59.92875	
10:21:25	757.6		85.23	
10:21:55	746.8		84.015	
10:22:25	747.5		84.09375	
10:22:55	746.8		84.015	
10:23:25	730.8		82.215	
10:23:55	730.5		82.18125	
10:24:25	727.3		81.82125	
10:24:55	723.1		81.34875	
10:25:25	737		82.9125	
10:25:55	714.8		80.415	
10:26:25	721.5		81.16875	
10:26:55	705.2		79.335	
10:27:25	731.5		82.29375	
10:27:55	715		80.4375	
10:28:25	779.1		87.64875	
10:28:55	783.6		88.155	
10:29:25	764.6		86.0175	
10:29:55	777.1		87.42375	
10:30:25	782.8		88.065	
10:30:55	791.6		89.055	
10:31:25	784.2		88.2225	
10:31:55	730.3		82.15875	
10:32:25	739.1		83.14875	
10:32:55	746		83.925	
10:33:25	772.3		86.88375	
10:33:55	745.6		83.88	
10:34:25	795		89.4375	
10:34:55	826		92.925	
10:35:25	795.8		89.5275	
10:35:55	784.7		88.27875	
10:36:25	766.9		86.27625	
10:36:55	605.7		68.14125	
10:37:25	751.7		84.56625	
10:37:55	765.8		86.1525	
10:38:25	756.2		85.0725	
10:38:55	756.6		85.1175	
10:39:25	747.5		84.09375	
10:39:55	763		85.8375	
10:40:25	744.1		83.71125	



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10:40:55	761.4		85.6575	
10:41:25	763		85.8375	
10:41:55	752.4		84.645	
10:42:25	748.2		84.1725	
10:42:55	757.7		85.24125	
10:43:25	742.5		83.53125	
10:43:55	744.4		83.745	
10:44:25	760.9		85.60125	
10:44:55	741.4		83.4075	
10:45:25	747.8		84.1275	
10:45:55	750.1		84.38625	
10:46:25	743.7		83.66625	
10:46:55	746.3		83.95875	
10:47:25	763.8		85.9275	
10:47:55	736.1		82.81125	
10:48:25	754.9		84.92625	
10:48:55	737		82.9125	
10:49:25	738.1		83.03625	
10:49:55	738.4		83.07	
10:50:25	745.4		83.8575	
10:50:55	739.2		83.16	
10:51:25	695.2		78.21	
10:51:55	481.2		54.135	
10:52:25	696.6		78.3675	
10:52:55	733.2		82.485	
10:53:25	751.6		84.555	
10:53:55	759.6		85.455	
10:54:25	785.1		88.32375	
10:54:55	788.2		88.6725	
10:55:25	795		89.4375	
10:55:55	790.8		88.965	
10:56:25	798.8		89.865	
10:56:55	778.5		87.58125	
10:57:25	798.4		89.82	
10:57:55	782		87.975	
10:58:25	760.9		85.60125	
10:58:55	766.3		86.20875	
10:59:25	761.2		85.635	
10:59:55	769.2		86.535	
11:00:25	744.8		83.79	
11:00:55	781.2		87.885	
11:01:25	801.1		90.12375	

11:01:55	772.8		86.94	
11:02:25	793.5		89.26875	
11:02:55	766		86.175	
11:03:25	787.4		88.5825	
11:03:55	816		91.8	
11:04:25	697.4		78.4575	
11:04:55	843.4		94.8825	
11:05:25	213.1		23.97375	
11:05:55	199.2		22.41	
11:06:25	846.3		95.20875	
11:06:55	687.7		77.36625	
11:07:25	788.6		88.7175	
11:07:55	804.8		90.54	
11:08:25	772.6		86.9175	
11:08:55	800		90	
11:09:25	795.1		89.44875	
11:09:55	764.6		86.0175	
11:10:25	771.4		86.7825	
11:10:55	771.5		86.79375	
11:11:25	759.2		85.41	
11:11:55	781		87.8625	
11:12:25	766		86.175	
11:12:55	787.8		88.6275	
11:13:25	777.9		87.51375	
11:13:55	778.8		87.615	
11:14:25	767.1		86.29875	
11:14:55	769.8		86.6025	
11:15:25	617.6		69.48	
11:15:55	193.5		21.76875	
11:16:25	367.2		41.31	
11:16:55	822.5		92.53125	
11:17:25	804.6		90.5175	
11:17:55	830.3		93.40875	
11:18:25	817.9		92.01375	
11:18:55	810		91.125	
11:19:25	678.6		76.3425	
11:19:55	851.5		95.79375	
11:20:25	361.7		40.69125	
11:20:55	660.2		74.2725	
11:21:25	275.2		30.96	
11:21:55	880.3		99.03375	
11:22:25	182.1		20.48625	



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11:22:55	194.3		21.85875	
11:23:25	847.9		95.38875	
11:23:55	218		24.525	
11:24:25	280.7		31.57875	
11:24:55	898.9		101.12625	
11:25:25	371		41.7375	
11:25:55	907.1		102.04875	
11:26:25	858		96.525	
11:26:55	844.9		95.05125	
11:27:25	865.4		97.3575	
11:27:55	899.3		101.17125	
11:28:25	904.4		101.745	
11:28:55	913.7		102.79125	
11:29:25	856.6		96.3675	
11:29:55	898.4		101.07	
11:30:25	872.2		98.1225	
11:30:55	908.5		102.20625	
11:31:25	921.7		103.69125	
11:31:55	932.3		104.88375	
11:32:25	951.9		107.08875	
11:32:55	478.1		53.78625	
11:33:25	949.2		106.785	
11:33:55	968.4		108.945	
11:34:25	858		96.525	
11:34:55	941.6		105.93	
11:35:25	906.6		101.9925	
11:35:55	901.5		101.41875	
11:36:25	279.5		31.44375	
11:36:55	934.8		105.165	
11:37:25	925.3		104.09625	
11:37:55	821.6		92.43	
11:38:25	634.2		71.3475	
11:38:55	476.6		53.6175	
11:39:25	883.5		99.39375	
11:39:55	890.8		100.215	
11:40:25	895.7		100.76625	
11:40:55	865.9		97.41375	
11:41:25	902.8		101.565	
11:41:55	923.9		103.93875	
11:42:25	1018		114.525	
11:42:55	198.4		22.32	
11:43:25	1024		115.2	



11:43:55	992		111.6	
11:44:25	902.8		101.565	
11:44:55	996.3		112.08375	
11:45:25	344.2		38.7225	
11:45:55	1010		113.625	
11:46:25	665.7		74.89125	
11:46:55	1050		118.125	
11:47:25	1012		113.85	
11:47:55	1014		114.075	
11:48:25	915.8		103.0275	
11:48:55	287.2		32.31	
11:49:25	1016		114.3	
11:49:55	1002		112.725	
11:50:25	882.1		99.23625	
11:50:55	1036		116.55	
11:51:25	938		105.525	
11:51:55	1006		113.175	
11:52:25	1033		116.2125	
11:52:55	1090		122.625	
11:53:25	327.9		36.88875	
11:53:55	1028		115.65	
11:54:25	798.1		89.78625	
11:54:55	306.1		34.43625	
11:55:25	269.5		30.31875	
11:55:55	417.4		46.9575	
11:56:25	361.8		40.7025	
11:56:55	734.8		82.665	
11:57:25	250.5		28.18125	
11:57:55	824.6		92.7675	
11:58:25	1005		113.0625	
11:58:55	1011		113.7375	
11:59:25	1027		115.5375	
11:59:55	253.8		28.5525	
12:00:25	330.6		37.1925	
12:00:55	1042		117.225	
12:01:25	1050		118.125	
12:01:55	964.1		108.46125	
12:02:25	283.9		31.93875	
12:02:55	1017		114.4125	
12:03:25	1053		118.4625	
12:03:55	1023		115.0875	
12:04:25	1052		118.35	



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12:04:55	1018		114.525	
12:05:25	990.4		111.42	
12:05:55	959.7		107.96625	
12:06:25	664.8		74.79	
12:06:55	902.5		101.53125	
12:07:25	897.4		100.9575	
12:07:55	921.3		103.64625	
12:08:25	896.5		100.85625	
12:08:55	879.1		98.89875	
12:09:25	946.7		106.50375	
12:09:55	932.7		104.92875	
12:10:25	907.9		102.13875	
12:10:55	924		103.95	
12:11:25	909.6		102.33	
12:11:55	971.9		109.33875	
12:12:25	932		104.85	
12:12:55	905.8		101.9025	
12:13:25	884.9		99.55125	
12:13:55	896.5		100.85625	
12:14:25	903.3		101.62125	
12:14:55	902.7		101.55375	
12:15:25	906.1		101.93625	
12:15:55	907.2		102.06	
12:16:25	928.5		104.45625	
12:16:55	876.8		98.64	
12:17:25	878.6		98.8425	
12:17:55	899.5		101.19375	
12:18:25	913.3		102.74625	
12:18:55	885.7		99.64125	
12:19:25	887.6		99.855	
12:19:55	854.7		96.15375	
12:20:25	894.1		100.58625	
12:20:55	865.1		97.32375	
12:21:25	936.7		105.37875	
12:21:55	906.1		101.93625	
12:22:25	921.5		103.66875	
12:22:55	871		97.9875	
12:23:25	885.1		99.57375	
12:23:55	894.6		100.6425	
12:24:25	916.6		103.1175	
12:24:55	905.7		101.89125	
12:25:25	878.4		98.82	

12:25:55	887.1		99.79875	
12:26:25	888.6		99.9675	
12:26:55	886.3		99.70875	
12:27:25	907.4		102.0825	
12:27:55	900.1		101.26125	
12:28:25	852.1		95.86125	
12:28:55	850.4		95.67	
12:29:25	861.6		96.93	
12:29:55	832.5		93.65625	
12:30:25	865.8		97.4025	
12:30:55	854.8		96.165	
12:31:25	925.1		104.07375	
12:31:55	913.1		102.72375	
12:32:25	938.3		105.55875	
12:32:55	498.3		56.05875	
12:33:25	952.2		107.1225	
12:33:55	904.4		101.745	
12:34:25	874.9		98.42625	
12:34:55	868.9		97.75125	
12:35:25	819		92.1375	
12:35:55	799.4		89.9325	
12:36:25	829		93.2625	
12:36:55	862.6		97.0425	
12:37:25	921.5		103.66875	
12:37:55	876.2		98.5725	
12:38:25	951		106.9875	
12:38:55	900.4		101.295	
12:39:25	860.4		96.795	
12:39:55	853.9		96.06375	
12:40:25	887.6		99.855	
12:40:55	895.2		100.71	
12:41:25	886.7		99.75375	
12:41:55	864.3		97.23375	
12:42:25	811.8		91.3275	
12:42:55	885.1		99.57375	
12:43:25	871.3		98.02125	
12:43:55	856.1		96.31125	
12:44:25	890.8		100.215	
12:44:55	945.7		106.39125	
12:45:25	941.9		105.96375	
12:45:55	829.5		93.31875	
12:46:25	884.4		99.495	



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12:46:55	855.6		96.255	
12:47:25	838.7		94.35375	
12:47:55	880.8		99.09	
12:48:25	853.6		96.03	
12:48:55	900.3		101.28375	
12:49:25	830.9		93.47625	
12:49:55	725.4		81.6075	
12:50:25	865.4		97.3575	
12:50:55	871.6		98.055	
12:51:25	861.3		96.89625	
12:51:55	925.1		104.07375	
12:52:25	919.4		103.4325	
12:52:55	869.1		97.77375	
12:53:25	933.1		104.97375	
12:53:55	869.4		97.8075	
12:54:25	902.5		101.53125	
12:54:55	873.4		98.2575	
12:55:25	913.1		102.72375	
12:55:55	188.1		21.16125	
12:56:25	162.8		18.315	
12:56:55	948.6		106.7175	
12:57:25	923.6		103.905	
12:57:55	983.7		110.66625	
12:58:25	794.2		89.3475	
12:58:55	874.8		98.415	
12:59:25	913.9		102.81375	
12:59:55	960.9		108.10125	
13:00:25	913.6		102.78	
13:00:55	920.9		103.60125	
13:01:25	880.8		99.09	
13:01:55	182.9		20.57625	
13:02:25	156.1		17.56125	
13:02:55	841.7		94.69125	
13:03:25	955.1		107.44875	
13:03:55	918.3		103.30875	
13:04:25	564.9		63.55125	
13:04:55	858.2		96.5475	
13:05:25	771.7		86.81625	
13:05:55	926.7		104.25375	
13:06:25	860.1		96.76125	
13:06:55	854.2		96.0975	
13:07:25	853.6		96.03	

13:07:55	826.8		93.015	
13:08:25	932.4		104.895	
13:08:55	863.9		97.18875	
13:09:25	857.2		96.435	
13:09:55	836.3		94.08375	
13:10:25	936.4		105.345	
13:10:55	890.1		100.13625	
13:11:25	902.8		101.565	
13:11:55	877.8		98.7525	
13:12:25	884.1		99.46125	
13:12:55	878		98.775	
13:13:25	848		95.4	
13:13:55	870.2		97.8975	
13:14:25	832.7		93.67875	
13:14:55	814.6		91.6425	
13:15:25	914.1		102.83625	
13:15:55	888.2		99.9225	
13:16:25	829.6		93.33	
13:16:55	822.8		92.565	
13:17:25	806.5		90.73125	
13:17:55	812.4		91.395	
13:18:25	857.2		96.435	
13:18:55	841.2		94.635	
13:19:25	674.4		75.87	
13:19:55	861.6		96.93	
13:20:25	800.3		90.03375	
13:20:55	472.4		53.145	
13:21:25	872.9		98.20125	
13:21:55	831.9		93.58875	
13:22:25	842.8		94.815	
13:22:55	835.7		94.01625	
13:23:25	889		100.0125	
13:23:55	849.3		95.54625	
13:24:25	864.6		97.2675	
13:24:55	786.6		88.4925	
13:25:25	874.8		98.415	
13:25:55	816.3		91.83375	
13:26:25	853.7		96.04125	
13:26:55	856.4		96.345	
13:27:25	851		95.7375	
13:27:55	812.1		91.36125	
13:28:25	758.9		85.37625	



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13:28:55	790.2		88.8975	
13:29:25	753.8		84.8025	
13:29:55	842.2		94.7475	
13:30:25	707.5		79.59375	
13:30:55	820.5		92.30625	
13:31:25	796.5		89.60625	
13:31:55	814.3		91.60875	
13:32:25	799.6		89.955	
13:32:55	811.3		91.27125	
13:33:25	754.4		84.87	
13:33:55	773		86.9625	
13:34:25	808.1		90.91125	
13:34:55	821.7		92.44125	
13:35:25	831.9		93.58875	
13:35:55	808.6		90.9675	
13:36:25	777.4		87.4575	
13:36:55	802.2		90.2475	
13:37:25	817.1		91.92375	
13:37:55	815.4		91.7325	
13:38:25	828.1		93.16125	
13:38:55	824.4		92.745	
13:39:25	807.2		90.81	
13:39:55	780.1		87.76125	
13:40:25	661.5		74.41875	
13:40:55	729.6		82.08	
13:41:25	780.6		87.8175	
13:41:55	790.7		88.95375	
13:42:25	780.9		87.85125	
13:42:55	773.4		87.0075	
13:43:25	773.1		86.97375	
13:43:55	774.5		87.13125	
13:44:25	746.7		84.00375	
13:44:55	808.9		91.00125	
13:45:25	823.9		92.68875	
13:45:55	292.6		32.9175	
13:46:25	830.8		93.465	
13:46:55	314.9		35.42625	
13:47:25	821.3		92.39625	
13:47:55	229.3		25.79625	
13:48:25	457.5		51.46875	
13:48:55	253		28.4625	
13:49:25	907.1		102.04875	

13:49:55	866.5		97.48125	
13:50:25	824.6		92.7675	
13:50:55	851		95.7375	
13:51:25	852.9		95.95125	
13:51:55	853.6		96.03	
13:52:25	844.5		95.00625	
13:52:55	866.7		97.50375	
13:53:25	729.6		82.08	
13:53:55	834.2		93.8475	
13:54:25	219.6		24.705	
13:54:55	360.6		40.5675	
13:55:25	819.4		92.1825	
13:55:55	668.6		75.2175	
13:56:25	849.3		95.54625	
13:56:55	733.4		82.5075	
13:57:25	754.4		84.87	
13:57:55	801.9		90.21375	
13:58:25	808		90.9	
13:58:55	847.2		95.31	
13:59:25	812.7		91.42875	
13:59:55	806.4		90.72	
14:00:25	802.1		90.23625	
14:00:55	384.8		43.29	
14:01:25	779.1		87.64875	
14:01:55	663.7		74.66625	
14:02:25	329.8		37.1025	
14:02:55	747.3		84.07125	
14:03:25	642.9		72.32625	
14:03:55	732.6		82.4175	
14:04:25	725.3		81.59625	
14:04:55	727.2		81.81	
14:05:25	708.3		79.68375	
14:05:55	690.8		77.715	
14:06:25	721.2		81.135	
14:06:55	734.5		82.63125	
Average	<b>752.3</b>		<b>84.63384698</b>	



**Appendix Table 5, Daily solar irradiance 22 June 2019**

Site Name:	Tambolongan Strait	Date:	22/06/2019	Equipment:
Location:				
	Lat: -6.6456739	Long: 120.4305870		
Elevation:	+ 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m <sup>2</sup> )	Air Temperature (degree C)	PV Power output (W/m <sup>2</sup> )	Remark
09:43:28	683.2		76.86	
09:43:58	685.1		77.07375	
09:44:28	679.4		76.4325	
09:44:58	683.9		76.93875	
09:45:28	691.1		77.74875	
09:45:58	691.5		77.79375	
09:46:28	690		77.625	
09:46:58	694.2		78.0975	
09:47:28	691.4		77.7825	
09:47:58	687.6		77.355	
09:48:28	689		77.5125	
09:48:58	690.8		77.715	
09:49:28	690		77.625	
09:49:58	690.3		77.65875	
09:50:28	695.8		78.2775	
09:50:58	704.9		79.30125	
09:51:28	706.4		79.47	
09:51:58	704.5		79.25625	
09:52:28	708.8		79.74	
09:52:58	703.4		79.1325	
09:53:28	709.6		79.83	
09:53:58	709.9		79.86375	
09:54:28	705.3		79.34625	
09:54:58	714.8		80.415	
09:55:28	710.6		79.9425	
09:55:58	715		80.4375	
09:56:28	720.4		81.045	
09:56:58	716.1		80.56125	
09:57:28	711.7		80.06625	
09:57:58	716.3		80.58375	
09:58:28	712.8		80.19	
09:58:58	717		80.6625	
09:59:28	732.1		82.36125	



09:59:58	738.3		83.05875	
10:00:28	750		84.375	
10:00:58	748.1		84.16125	
10:01:28	753.3		84.74625	
10:01:58	750.6		84.4425	
10:02:28	751.7		84.56625	
10:02:58	751.7		84.56625	
10:03:28	744		83.7	
10:03:58	748.2		84.1725	
10:04:28	749.4		84.3075	
10:04:58	744.6		83.7675	
10:05:28	757.1		85.17375	
10:05:58	747.9		84.13875	
10:06:28	753		84.7125	
10:06:58	741.1		83.37375	
10:07:28	734.9		82.67625	
10:07:58	748.4		84.195	
10:08:28	752		84.6	
10:08:58	756.2		85.0725	
10:09:28	763.4		85.8825	
10:09:58	751.4		84.5325	
10:10:28	744		83.7	
10:10:58	752.4		84.645	
10:11:28	753.6		84.78	
10:11:58	757.6		85.23	
10:12:28	771.1		86.74875	
10:12:58	772		86.85	
10:13:28	764.4		85.995	
10:13:58	807.2		90.81	
10:14:28	776.8		87.39	
10:14:58	794.6		89.3925	
10:15:28	783.1		88.09875	
10:15:58	763.3		85.87125	
10:16:28	785.8		88.4025	
10:16:58	783.4		88.1325	
10:17:28	803		90.3375	
10:17:58	776.4		87.345	
10:18:28	793.2		89.235	
10:18:58	801.3		90.14625	
10:19:28	804.8		90.54	
10:19:58	776.1		87.31125	
10:20:28	765.8		86.1525	



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10:20:58	775.8		87.2775	
10:21:28	808.1		90.91125	
10:21:58	765.5		86.11875	
10:22:28	786.7		88.50375	
10:22:58	782		87.975	
10:23:28	809.5		91.06875	
10:23:58	786.7		88.50375	
10:24:28	801.6		90.18	
10:24:58	783.6		88.155	
10:25:28	798.3		89.80875	
10:25:58	817.5		91.96875	
10:26:28	806.4		90.72	
10:26:58	804		90.45	
10:27:28	799.4		89.9325	
10:27:58	786.3		88.45875	
10:28:28	794.2		89.3475	
10:28:58	819.4		92.1825	
10:29:28	799.9		89.98875	
10:29:58	776.6		87.3675	
10:30:28	761.2		85.635	
10:30:58	764.2		85.9725	
10:31:28	765.5		86.11875	
10:31:58	794.3		89.35875	
10:32:28	783.7		88.16625	
10:32:58	766.9		86.27625	
10:33:28	798		89.775	
10:33:58	780.1		87.76125	
10:34:28	767.6		86.355	
10:34:58	779.1		87.64875	
10:35:28	766.9		86.27625	
10:35:58	760.4		85.545	
10:36:28	795.6		89.505	
10:36:58	786.7		88.50375	
10:37:28	783.9		88.18875	
10:37:58	782.9		88.07625	
10:38:28	773.7		87.04125	
10:38:58	800		90	
10:39:28	795.8		89.5275	
10:39:58	788.8		88.74	
10:40:28	807.2		90.81	
10:40:58	792.6		89.1675	
10:41:28	780.7		87.82875	

10:41:58	820.9		92.35125	
10:42:28	842.8		94.815	
10:42:58	827.6		93.105	
10:43:28	836.6		94.1175	
10:43:58	837.9		94.26375	
10:44:28	827.1		93.04875	
10:44:58	823.6		92.655	
10:45:28	812.4		91.395	
10:45:58	816.7		91.87875	
10:46:28	813.7		91.54125	
10:46:58	820.6		92.3175	
10:47:28	834.2		93.8475	
10:47:58	814.8		91.665	
10:48:28	803.5		90.39375	
10:48:58	833.3		93.74625	
10:49:28	823.6		92.655	
10:49:58	802.9		90.32625	
10:50:28	819.8		92.2275	
10:50:58	829		93.2625	
10:51:28	829.5		93.31875	
10:51:58	840.7		94.57875	
10:52:28	822		92.475	
10:52:58	841.1		94.62375	
10:53:28	832.8		93.69	
10:53:58	817.6		91.98	
10:54:28	835.2		93.96	
10:54:58	837.1		94.17375	
10:55:28	849.4		95.5575	
10:55:58	838.2		94.2975	
10:56:28	827.1		93.04875	
10:56:58	834.4		93.87	
10:57:28	849.1		95.52375	
10:57:58	844.7		95.02875	
10:58:28	840.6		94.5675	
10:58:58	841.1		94.62375	
10:59:28	834.6		93.8925	
10:59:58	838		94.275	
11:00:28	843.6		94.905	
11:00:58	859.9		96.73875	
11:01:28	849.4		95.5575	
11:01:58	836.8		94.14	
11:02:28	844.1		94.96125	



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11:02:58	812.7		91.42875	
11:03:28	831.5		93.54375	
11:03:58	839.9		94.48875	
11:04:28	831.7		93.56625	
11:04:58	829.5		93.31875	
11:05:28	831.7		93.56625	
11:05:58	840.6		94.5675	
11:06:28	820.1		92.26125	
11:06:58	829.2		93.285	
11:07:28	831.7		93.56625	
11:07:58	853.6		96.03	
11:08:28	842.2		94.7475	
11:08:58	824.4		92.745	
11:09:28	834.4		93.87	
11:09:58	848.3		95.43375	
11:10:28	854.2		96.0975	
11:10:58	844.9		95.05125	
11:11:28	839.6		94.455	
11:11:58	850.7		95.70375	
11:12:28	845.6		95.13	
11:12:58	847.9		95.38875	
11:13:28	853.4		96.0075	
11:13:58	837.9		94.26375	
11:14:28	839.6		94.455	
11:14:58	838.5		94.33125	
11:15:28	848.2		95.4225	
11:15:58	858		96.525	
11:16:28	844.5		95.00625	
11:16:58	846.6		95.2425	
11:17:28	846.4		95.22	
11:17:58	839.5		94.44375	
11:18:28	853.6		96.03	
11:18:58	855		96.1875	
11:19:28	857.2		96.435	
11:19:58	849.4		95.5575	
11:20:28	854		96.075	
11:20:58	851.5		95.79375	
11:21:28	861.8		96.9525	
11:21:58	857.4		96.4575	
11:22:28	859.7		96.71625	
11:22:58	858.9		96.62625	
11:23:28	853.7		96.04125	

11:23:58	864.2		97.2225	
11:24:28	851.2		95.76	
11:24:58	868.9		97.75125	
11:25:28	850.6		95.6925	
11:25:58	854		96.075	
11:26:28	850.4		95.67	
11:26:58	857		96.4125	
11:27:28	860.8		96.84	
11:27:58	855.1		96.19875	
11:28:28	854.8		96.165	
11:28:58	885.9		99.66375	
11:29:28	874		98.325	
11:29:58	864		97.2	
11:30:28	862.6		97.0425	
11:30:58	871.1		97.99875	
11:31:28	885.1		99.57375	
11:31:58	885.1		99.57375	
11:32:28	868		97.65	
11:32:58	891.3		100.27125	
11:33:28	883.2		99.36	
11:33:58	882.7		99.30375	
11:34:28	867.2		97.56	
11:34:58	897.9		101.01375	
11:35:28	887.9		99.88875	
11:35:58	888.4		99.945	
11:36:28	867		97.5375	
11:36:58	892.8		100.44	
11:37:28	879.4		98.9325	
11:37:58	875.3		98.47125	
11:38:28	878.4		98.82	
11:38:58	876.2		98.5725	
11:39:28	884.8		99.54	
11:39:58	874.6		98.3925	
11:40:28	890.6		100.1925	
11:40:58	886		99.675	
11:41:28	879.4		98.9325	
11:41:58	877.3		98.69625	
11:42:28	873.4		98.2575	
11:42:58	883.2		99.36	
11:43:28	882.9		99.32625	
11:43:58	888.6		99.9675	
11:44:28	861.3		96.89625	



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11:44:58	852.6		95.9175	
11:45:28	884.4		99.495	
11:45:58	868.3		97.68375	
11:46:28	882.5		99.28125	
11:46:58	876.2		98.5725	
11:47:28	876.7		98.62875	
11:47:58	862.6		97.0425	
11:48:28	877.6		98.73	
11:48:58	885.7		99.64125	
11:49:28	878.1		98.78625	
11:49:58	894.4		100.62	
11:50:28	894.3		100.60875	
11:50:58	894.1		100.58625	
11:51:28	893.2		100.485	
11:51:58	890.9		100.22625	
11:52:28	889		100.0125	
11:52:58	883.2		99.36	
11:53:28	868.1		97.66125	
11:53:58	878.1		98.78625	
11:54:28	879.5		98.94375	
11:54:58	870.8		97.965	
11:55:28	876.7		98.62875	
11:55:58	888.6		99.9675	
11:56:28	870.3		97.90875	
11:56:58	879.7		98.96625	
11:57:28	890.9		100.22625	
11:57:58	876.7		98.62875	
11:58:28	861.5		96.91875	
11:58:58	877		98.6625	
11:59:28	888.9		100.00125	
11:59:58	884.8		99.54	
12:00:28	891.1		100.24875	
12:00:58	869.4		97.8075	
12:01:28	872.6		98.1675	
12:01:58	877.3		98.69625	
12:02:28	888.6		99.9675	
12:02:58	881.4		99.1575	
12:03:28	885.1		99.57375	
12:03:58	876.7		98.62875	
12:04:28	879.2		98.91	
12:04:58	892.7		100.42875	
12:05:28	875.9		98.53875	

12:05:58	876.5		98.60625	
12:06:28	879.2		98.91	
12:06:58	888.4		99.945	
12:07:28	874		98.325	
12:07:58	865.8		97.4025	
12:08:28	877		98.6625	
12:08:58	870.7		97.95375	
12:09:28	885.6		99.63	
12:09:58	884.4		99.495	
12:10:28	893.8		100.5525	
12:10:58	885.4		99.6075	
12:11:28	870.7		97.95375	
12:11:58	877.5		98.71875	
12:12:28	870.2		97.8975	
12:12:58	891.4		100.2825	
12:13:28	884.9		99.55125	
12:13:58	874.5		98.38125	
12:14:28	883.5		99.39375	
12:14:58	871		97.9875	
12:15:28	890.5		100.18125	
12:15:58	877.5		98.71875	
12:16:28	878.7		98.85375	
12:16:58	875.1		98.44875	
12:17:28	866.7		97.50375	
12:17:58	884.3		99.48375	
12:18:28	890.5		100.18125	
12:18:58	880.6		99.0675	
12:19:28	877.3		98.69625	
12:19:58	875.4		98.4825	
12:20:28	896.5		100.85625	
12:20:58	882.7		99.30375	
12:21:28	886.2		99.6975	
12:21:58	877.2		98.685	
12:22:28	866.4		97.47	
12:22:58	859.7		96.71625	
12:23:28	871.9		98.08875	
12:23:58	884.8		99.54	
12:24:28	881		99.1125	
12:24:58	866.2		97.4475	
12:25:28	854.4		96.12	
12:25:58	875.4		98.4825	
12:26:28	865		97.3125	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:26:58	879.5		98.94375	
12:27:28	873.4		98.2575	
12:27:58	879.7		98.96625	
12:28:28	864.3		97.23375	
12:28:58	850.7		95.70375	
12:29:28	855.8		96.2775	
12:29:58	874.8		98.415	
12:30:28	881.1		99.12375	
12:30:58	881.4		99.1575	
12:31:28	875.3		98.47125	
12:31:58	895.7		100.76625	
12:32:28	862.7		97.05375	
12:32:58	881.4		99.1575	
12:33:28	867.3		97.57125	
12:33:58	869.9		97.86375	
12:34:28	874		98.325	
12:34:58	879.9		98.98875	
12:35:28	865.9		97.41375	
12:35:58	877		98.6625	
12:36:28	877.8		98.7525	
12:36:58	862.7		97.05375	
12:37:28	873		98.2125	
12:37:58	859.6		96.705	
12:38:28	864.5		97.25625	
12:38:58	876.2		98.5725	
12:39:28	863.7		97.16625	
12:39:58	871.6		98.055	
12:40:28	864.5		97.25625	
12:40:58	872.1		98.11125	
12:41:28	870.2		97.8975	
12:41:58	873.5		98.26875	
12:42:28	863.9		97.18875	
12:42:58	873.8		98.3025	
12:43:28	867.8		97.6275	
12:43:58	863.1		97.09875	
12:44:28	881.1		99.12375	
12:44:58	853.6		96.03	
12:45:28	863.5		97.14375	
12:45:58	863.7		97.16625	
12:46:28	847.2		95.31	
12:46:58	849.9		95.61375	
12:47:28	868.4		97.695	



12:47:58	851.3		95.77125	
12:48:28	862		96.975	
12:48:58	867.8		97.6275	
12:49:28	865.1		97.32375	
12:49:58	875.9		98.53875	
12:50:28	858.6		96.5925	
12:50:58	865.8		97.4025	
12:51:28	857		96.4125	
12:51:58	883.7		99.41625	
12:52:28	855.3		96.22125	
12:52:58	864.5		97.25625	
12:53:28	841.1		94.62375	
12:53:58	863.5		97.14375	
12:54:28	846		95.175	
12:54:58	858		96.525	
12:55:28	863.5		97.14375	
12:55:58	869.9		97.86375	
12:56:28	861.2		96.885	
12:56:58	840.9		94.60125	
12:57:28	849.4		95.5575	
12:57:58	866.7		97.50375	
12:58:28	847.2		95.31	
12:58:58	864.5		97.25625	
12:59:28	847.4		95.3325	
12:59:58	839.1		94.39875	
13:00:28	840.9		94.60125	
13:00:58	829		93.2625	
13:01:28	827.9		93.13875	
13:01:58	841.7		94.69125	
13:02:28	846.8		95.265	
13:02:58	835.3		93.97125	
13:03:28	835		93.9375	
13:03:58	832.2		93.6225	
13:04:28	851.7		95.81625	
13:04:58	843.9		94.93875	
13:05:28	852.9		95.95125	
13:05:58	837.4		94.2075	
13:06:28	822.8		92.565	
13:06:58	838.2		94.2975	
13:07:28	853.1		95.97375	
13:07:58	843.6		94.905	
13:08:28	837.7		94.24125	



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13:08:58	841.7		94.69125	
13:09:28	827		93.0375	
13:09:58	829.3		93.29625	
13:10:28	854.2		96.0975	
13:10:58	849.3		95.54625	
13:11:28	833.9		93.81375	
13:11:58	818.2		92.0475	
13:12:28	831.5		93.54375	
13:12:58	805.7		90.64125	
13:13:28	811.8		91.3275	
13:13:58	845.2		95.085	
13:14:28	837.6		94.23	
13:14:58	838.8		94.365	
13:15:28	835.8		94.0275	
13:15:58	830.6		93.4425	
13:16:28	828.4		93.195	
13:16:58	828.5		93.20625	
13:17:28	826.2		92.9475	
13:17:58	818.6		92.0925	
13:18:28	821.1		92.37375	
13:18:58	836.5		94.10625	
13:19:28	832		93.6	
13:19:58	825.2		92.835	
13:20:28	807.3		90.82125	
13:20:58	810.6		91.1925	
13:21:28	827.9		93.13875	
13:21:58	833.3		93.74625	
13:22:28	823		92.5875	
13:22:58	827.6		93.105	
13:23:28	804.9		90.55125	
13:23:58	806.1		90.68625	
13:24:28	801.8		90.2025	
13:24:58	821.7		92.44125	
13:25:28	811.8		91.3275	
13:25:58	787.4		88.5825	
13:26:28	811.8		91.3275	
13:26:58	798		89.775	
13:27:28	801.3		90.14625	
13:27:58	812.5		91.40625	
13:28:28	829.6		93.33	
13:28:58	771.5		86.79375	
13:29:28	794.6		89.3925	

13:29:58	808		90.9	
13:30:28	803		90.3375	
13:30:58	829.6		93.33	
13:31:28	800.8		90.09	
13:31:58	800.3		90.03375	
13:32:28	801		90.1125	
13:32:58	803.7		90.41625	
13:33:28	801		90.1125	
13:33:58	801.8		90.2025	
13:34:28	793.7		89.29125	
13:34:58	786.4		88.47	
13:35:28	779.9		87.73875	
13:35:58	777.7		87.49125	
13:36:28	773.9		87.06375	
13:36:58	790.1		88.88625	
13:37:28	785.3		88.34625	
13:37:58	783.4		88.1325	
13:38:28	779		87.6375	
13:38:58	789.9		88.86375	
13:39:28	783.1		88.09875	
13:39:58	795.1		89.44875	
13:40:28	772.5		86.90625	
13:40:58	783.4		88.1325	
13:41:28	782.9		88.07625	
13:41:58	797		89.6625	
13:42:28	789.4		88.8075	
13:42:58	767.1		86.29875	
13:43:28	784.5		88.25625	
13:43:58	774.5		87.13125	
13:44:28	764.1		85.96125	
13:44:58	774.4		87.12	
13:45:28	782.8		88.065	
13:45:58	757.1		85.17375	
13:46:28	751.6		84.555	
13:46:58	771.5		86.79375	
13:47:28	780.4		87.795	
13:47:58	791.2		89.01	
13:48:28	761.9		85.71375	
13:48:58	770.3		86.65875	
13:49:28	757		85.1625	
13:49:58	754.6		84.8925	
13:50:28	751.1		84.49875	



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13:50:58	766		86.175	
13:51:28	772.8		86.94	
13:51:58	765.5		86.11875	
13:52:28	749.5		84.31875	
13:52:58	743		83.5875	
13:53:28	754.9		84.92625	
13:53:58	753.8		84.8025	
13:54:28	715.9		80.53875	
13:54:58	757.4		85.2075	
13:55:28	735.6		82.755	
13:55:58	737.5		82.96875	
13:56:28	740.5		83.30625	
13:56:58	734.9		82.67625	
13:57:28	750.3		84.40875	
13:57:58	738.9		83.12625	
13:58:28	737.3		82.94625	
13:58:58	740.2		83.2725	
13:59:28	759.6		85.455	
13:59:58	744.9		83.80125	
14:00:28	742.7		83.55375	
14:00:58	727.2		81.81	
14:01:28	715.8		80.5275	
14:01:58	737.5		82.96875	
14:02:28	738.7		83.10375	
14:02:58	724.6		81.5175	
14:03:28	722		81.225	
14:03:58	747		84.0375	
14:04:28	708.2		79.6725	
14:04:58	722.3		81.25875	
14:05:28	732.7		82.42875	
14:05:58	741.6		83.43	
14:06:28	717.2		80.685	
14:06:58	717.2		80.685	
14:07:28	724.5		81.50625	
14:07:58	729.9		82.11375	
14:08:28	710.2		79.8975	
14:08:58	735.1		82.69875	
14:09:28	731.9		82.33875	
14:09:58	720.2		81.0225	
14:10:28	730.7		82.20375	
14:10:58	720.7		81.07875	
14:11:28	726.2		81.6975	

14:11:58	710.4		79.92	
14:12:28	712		80.1	
14:12:58	717.2		80.685	
14:13:28	708.2		79.6725	
14:13:58	734.3		82.60875	
14:14:28	731.5		82.29375	
14:14:58	712.1		80.11125	
14:15:28	684.9		77.05125	
14:15:58	707.2		79.56	
14:16:28	698.5		78.58125	
14:16:58	706.8		79.515	
14:17:28	703.4		79.1325	
14:17:58	717.7		80.74125	
14:18:28	706		79.425	
14:18:58	705.6		79.38	
14:19:28	686.2		77.1975	
14:19:58	685.4		77.1075	
14:20:28	695.7		78.26625	
14:20:58	706.4		79.47	
14:21:28	694.1		78.08625	
14:21:58	713.4		80.2575	
14:22:28	693.6		78.03	
14:22:58	688.2		77.4225	
14:23:28	692.3		77.88375	
14:23:58	702.5		79.03125	
14:24:28	679.7		76.46625	
14:24:58	686.5		77.23125	
14:25:28	691.1		77.74875	
14:25:58	695.7		78.26625	
14:26:28	680.9		76.60125	
14:26:58	695.3		78.22125	
14:27:28	692.3		77.88375	
14:27:58	668.9		75.25125	
14:28:28	667.8		75.1275	
14:28:58	679.8		76.4775	
14:29:28	685.7		77.14125	
14:29:58	668		75.15	
14:30:28	677.6		76.23	
14:30:58	686		77.175	
14:31:28	673.8		75.8025	
14:31:58	642.3		72.25875	
14:32:28	643.2		72.36	



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14:32:58	655.3		73.72125	
14:33:28	661.9		74.46375	
14:33:58	646.4		72.72	
14:34:28	661.3		74.39625	
14:34:58	672.4		75.645	
14:35:28	652.6		73.4175	
14:35:58	627.4		70.5825	
14:36:28	640.9		72.10125	
14:36:58	636.8		71.64	
14:37:28	647.7		72.86625	
14:37:58	639.8		71.9775	
14:38:28	648.6		72.9675	
14:38:58	628.5		70.70625	
14:39:28	637.9		71.76375	
14:39:58	640.7		72.07875	
14:40:28	638.2		71.7975	
14:40:58	636.3		71.58375	
14:41:28	638		71.775	
14:41:58	636		71.55	
14:42:28	629.3		70.79625	
14:42:58	613.9		69.06375	
14:43:28	637.1		71.67375	
14:43:58	631.1		70.99875	
14:44:28	620		69.75	
14:44:58	608.4		68.445	
14:45:28	636.8		71.64	
14:45:58	624.4		70.245	
14:46:28	595.4		66.9825	
14:46:58	622.2		69.9975	
14:47:28	614.9		69.17625	
14:47:58	621.4		69.9075	
14:48:28	639.3		71.92125	
14:48:58	607.9		68.38875	
14:49:28	617.9		69.51375	
14:49:58	613		68.9625	
14:50:28	643.7		72.41625	
14:50:58	603.2		67.86	
14:51:28	621.2		69.885	
14:51:58	616.6		69.3675	
14:52:28	463.5		52.14375	
14:52:58	445.3		50.09625	
14:53:28	628.4		70.695	

14:53:58	589.6		66.33	
14:54:28	589.1		66.27375	
14:54:58	593		66.7125	
14:55:28	594.9		66.92625	
14:55:58	600.5		67.55625	
14:56:28	458		51.525	
14:56:58	604		67.95	
14:57:28	593.7		66.79125	
14:57:58	593.4		66.7575	
14:58:28	592.4		66.645	
14:58:58	587.5		66.09375	
14:59:28	585.1		65.82375	
14:59:58	573.6		64.53	
<b>Average</b>	<b>799.5941379</b>		<b>89.9543405</b>	



**Appendix Table 6, Daily solar irradiance 24 June 2019**

Site Name:	Padang	Date:	24/06/2019	Equipment:
Location:				
	Lat: -6.2107990	Long: 120.4280900		
Elevation:	+ 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m2)	Air Temperature (degree C)	PV Power output (W/m2)	Remark
09:00:15	544.9		61.30125	
09:00:45	551.9		62.08875	
09:01:15	551.7		62.06625	
09:01:45	558		62.775	
09:02:15	563.6		63.405	
09:02:45	565.2		63.585	
09:03:15	564.1		63.46125	
09:03:45	568.7		63.97875	
09:04:15	570.4		64.17	
09:04:45	576.4		64.845	
09:05:15	581.3		65.39625	
09:05:45	581.6		65.43	
09:06:15	586.5		65.98125	
09:06:45	588		66.15	
09:07:15	591.1		66.49875	
09:07:45	588.6		66.2175	
09:08:15	592.9		66.70125	
09:08:45	600		67.5	
09:09:15	605.4		68.1075	
09:09:45	608.9		68.50125	
09:10:15	609.7		68.59125	
09:10:45	605.9		68.16375	
09:11:15	610		68.625	
09:11:45	616		69.3	
09:12:15	626.5		70.48125	
09:12:45	639.3		71.92125	
09:13:15	651.8		73.3275	
09:13:45	660		74.25	
09:14:15	679.7		76.46625	
09:14:45	701.5		78.91875	
09:15:15	704.7		79.27875	
09:15:45	698.8		78.615	
09:16:15	683		76.8375	



09:16:45	681.9		76.71375	
09:17:15	686.8		77.265	
09:17:45	694.4		78.12	
09:18:15	701.8		78.9525	
09:18:45	688.4		77.445	
09:19:15	715.6		80.505	
09:19:45	703.9		79.18875	
09:20:15	708		79.65	
09:20:45	723.9		81.43875	
09:21:15	741.1		83.37375	
09:21:45	736.2		82.8225	
09:22:15	745.4		83.8575	
09:22:45	746.7		84.00375	
09:23:15	737.6		82.98	
09:23:45	747.3		84.07125	
09:24:15	737.2		82.935	
09:24:45	734.6		82.6425	
09:25:15	743.7		83.66625	
09:25:45	757.4		85.2075	
09:26:15	769.9		86.61375	
09:26:45	780.4		87.795	
09:27:15	787.8		88.6275	
09:27:45	787.2		88.56	
09:28:15	798.4		89.82	
09:28:45	243.7		27.41625	
09:29:15	338.1		38.03625	
09:29:45	780.2		87.7725	
09:30:15	750		84.375	
09:30:45	255.4		28.7325	
09:31:15	348		39.15	
09:31:45	779.4		87.6825	
09:32:15	630.4		70.92	
09:32:45	329.8		37.1025	
09:33:15	259.2		29.16	
09:33:45	793.1		89.22375	
09:34:15	785.6		88.38	
09:34:45	791.3		89.02125	
09:35:15	795.4		89.4825	
09:35:45	578.5		65.08125	
09:36:15	265.7		29.89125	
09:36:45	547.9		61.63875	
09:37:15	831.2		93.51	



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09:37:45	841.1		94.62375	
09:38:15	415		46.6875	
09:38:45	191.7		21.56625	
09:39:15	176.5		19.85625	
09:39:45	222		24.975	
09:40:15	392.2		44.1225	
09:40:45	693.6		78.03	
09:41:15	805.4		90.6075	
09:41:45	820.5		92.30625	
09:42:15	431.5		48.54375	
09:42:45	438.2		49.2975	
09:43:15	822.7		92.55375	
09:43:45	443.9		49.93875	
09:44:15	185.7		20.89125	
09:44:45	236.9		26.65125	
09:45:15	674		75.825	
09:45:45	658		74.025	
09:46:15	199.3		22.42125	
09:46:45	226.6		25.4925	
09:47:15	169.9		19.11375	
09:47:45	547.1		61.54875	
09:48:15	222		24.975	
09:48:45	318		35.775	
09:49:15	241.6		27.18	
09:49:45	182.2		20.4975	
09:50:15	165.1		18.57375	
09:50:45	179.4		20.1825	
09:51:15	776.9		87.40125	
09:51:45	775.5		87.24375	
09:52:15	786.7		88.50375	
09:52:45	804.6		90.5175	
09:53:15	738.1		83.03625	
09:53:45	780.2		87.7725	
09:54:15	773.1		86.97375	
09:54:45	772.5		86.90625	
09:55:15	764.7		86.02875	
09:55:45	747.6		84.105	
09:56:15	754.7		84.90375	
09:56:45	771.2		86.76	
09:57:15	781.8		87.9525	
09:57:45	138.7		15.60375	
09:58:15	157.2		17.685	

09:58:45	512.3		57.63375	
09:59:15	820.6		92.3175	
09:59:45	608.7		68.47875	
10:00:15	790.1		88.88625	
10:00:45	778.3		87.55875	
10:01:15	765.2		86.085	
10:01:45	649.1		73.02375	
10:02:15	775.6		87.255	
10:02:45	741.3		83.39625	
10:03:15	141.2		15.885	
10:03:45	144.7		16.27875	
10:04:15	228		25.65	
10:04:45	835.2		93.96	
10:05:15	817.3		91.94625	
10:05:45	813.3		91.49625	
10:06:15	821.9		92.46375	
10:06:45	850.1		95.63625	
10:07:15	210.6		23.6925	
10:07:45	820.5		92.30625	
10:08:15	570.1		64.13625	
10:08:45	385.4		43.3575	
10:09:15	477.7		53.74125	
10:09:45	777.7		87.49125	
10:10:15	758.4		85.32	
10:10:45	758.1		85.28625	
10:11:15	755.1		84.94875	
10:11:45	753.9		84.81375	
10:12:15	757.6		85.23	
10:12:45	769.6		86.58	
10:13:15	777.2		87.435	
10:13:45	780.6		87.8175	
10:14:15	805.3		90.59625	
10:14:45	797.3		89.69625	
10:15:15	785		88.3125	
10:15:45	776.8		87.39	
10:16:15	788		88.65	
10:16:45	797.8		89.7525	
10:17:15	799.2		89.91	
10:17:45	800		90	
10:18:15	799.6		89.955	
10:18:45	794.6		89.3925	
10:19:15	790.2		88.8975	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

10:19:45	786.1		88.43625	
10:20:15	767.9		86.38875	
10:20:45	775		87.1875	
10:21:15	774.2		87.0975	
10:21:45	766.8		86.265	
10:22:15	772.3		86.88375	
10:22:45	778.8		87.615	
10:23:15	793.4		89.2575	
10:23:45	799.2		89.91	
10:24:15	806.2		90.6975	
10:24:45	799.6		89.955	
10:25:15	829.2		93.285	
10:25:45	810.2		91.1475	
10:26:15	671		75.4875	
10:26:45	802.9		90.32625	
10:27:15	806.8		90.765	
10:27:45	828.4		93.195	
10:28:15	803.4		90.3825	
10:28:45	856.1		96.31125	
10:29:15	864		97.2	
10:29:45	863.9		97.18875	
10:30:15	886.2		99.6975	
10:30:45	803.7		90.41625	
10:31:15	754.3		84.85875	
10:31:45	882.7		99.30375	
10:32:15	861.2		96.885	
10:32:45	846.6		95.2425	
10:33:15	857		96.4125	
10:33:45	874.6		98.3925	
10:34:15	877.8		98.7525	
10:34:45	870		97.875	
10:35:15	882.7		99.30375	
10:35:45	890.5		100.18125	
10:36:15	808.7		90.97875	
10:36:45	848.5		95.45625	
10:37:15	899.5		101.19375	
10:37:45	909.8		102.3525	
10:38:15	891.7		100.31625	
10:38:45	874		98.325	
10:39:15	871.6		98.055	
10:39:45	864.6		97.2675	
10:40:15	683.9		76.93875	

10:40:45	874.6		98.3925	
10:41:15	871.6		98.055	
10:41:45	613.9		69.06375	
10:42:15	882.2		99.2475	
10:42:45	564.2		63.4725	
10:43:15	881.8		99.2025	
10:43:45	865.6		97.38	
10:44:15	853.9		96.06375	
10:44:45	857.5		96.46875	
10:45:15	872.9		98.20125	
10:45:45	866.2		97.4475	
10:46:15	862.9		97.07625	
10:46:45	173.7		19.54125	
10:47:15	812.2		91.3725	
10:47:45	804		90.45	
10:48:15	819.5		92.19375	
10:48:45	818.4		92.07	
10:49:15	840.3		94.53375	
10:49:45	837.7		94.24125	
10:50:15	833.8		93.8025	
10:50:45	842.5		94.78125	
10:51:15	859.4		96.6825	
10:51:45	211.2		23.76	
10:52:15	242.6		27.2925	
10:52:45	878.3		98.80875	
10:53:15	885.7		99.64125	
10:53:45	774.5		87.13125	
10:54:15	864.8		97.29	
10:54:45	867.5		97.59375	
10:55:15	866.7		97.50375	
10:55:45	883		99.3375	
10:56:15	508.3		57.18375	
10:56:45	892.8		100.44	
10:57:15	867.3		97.57125	
10:57:45	854.4		96.12	
10:58:15	846.4		95.22	
10:58:45	847.5		95.34375	
10:59:15	848.5		95.45625	
10:59:45	443.9		49.93875	
11:00:15	831.5		93.54375	
11:00:45	833.3		93.74625	
11:01:15	837.7		94.24125	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

11:01:45	839.3		94.42125	
11:02:15	836.6		94.1175	
11:02:45	833.6		93.78	
11:03:15	835.7		94.01625	
11:03:45	833.4		93.7575	
11:04:15	838		94.275	
11:04:45	839.5		94.44375	
11:05:15	839.9		94.48875	
11:05:45	840.9		94.60125	
11:06:15	840.1		94.51125	
11:06:45	850.4		95.67	
11:07:15	860.4		96.795	
11:07:45	868		97.65	
11:08:15	878.4		98.82	
11:08:45	884.6		99.5175	
11:09:15	880.5		99.05625	
11:09:45	909.6		102.33	
11:10:15	890		100.125	
11:10:45	898.9		101.12625	
11:11:15	872.7		98.17875	
11:11:45	864.8		97.29	
11:12:15	862.1		96.98625	
11:12:45	860.8		96.84	
11:13:15	867.3		97.57125	
11:13:45	869.6		97.83	
11:14:15	868.4		97.695	
11:14:45	868.9		97.75125	
11:15:15	876.5		98.60625	
11:15:45	881.1		99.12375	
11:16:15	880.6		99.0675	
11:16:45	876.8		98.64	
11:17:15	877.2		98.685	
11:17:45	869.4		97.8075	
11:18:15	868.8		97.74	
11:18:45	869.4		97.8075	
11:19:15	865.8		97.4025	
11:19:45	866.5		97.48125	
11:20:15	864		97.2	
11:20:45	863.4		97.1325	
11:21:15	875.3		98.47125	
11:21:45	889.2		100.035	
11:22:15	899.5		101.19375	

11:22:45	907.2		102.06	
11:23:15	900.1		101.26125	
11:23:45	901.1		101.37375	
11:24:15	895.2		100.71	
11:24:45	899.5		101.19375	
11:25:15	908.5		102.20625	
11:25:45	901.1		101.37375	
11:26:15	908.5		102.20625	
11:26:45	590.7		66.45375	
11:27:15	189		21.2625	
11:27:45	914.1		102.83625	
11:28:15	901.2		101.385	
11:28:45	894.1		100.58625	
11:29:15	894.1		100.58625	
11:29:45	895.8		100.7775	
11:30:15	896.2		100.8225	
11:30:45	892.8		100.44	
11:31:15	895.8		100.7775	
11:31:45	896.8		100.89	
11:32:15	902.3		101.50875	
11:32:45	904.4		101.745	
11:33:15	881		99.1125	
11:33:45	907.4		102.0825	
11:34:15	911.4		102.5325	
11:34:45	900.6		101.3175	
11:35:15	912.2		102.6225	
11:35:45	911.5		102.54375	
11:36:15	907.6		102.105	
11:36:45	923.4		103.8825	
11:37:15	934.6		105.1425	
11:37:45	392.9		44.20125	
11:38:15	929.6		104.58	
11:38:45	909.3		102.29625	
11:39:15	900.6		101.3175	
11:39:45	885.6		99.63	
11:40:15	913.7		102.79125	
11:40:45	899.6		101.205	
11:41:15	907.4		102.0825	
11:41:45	941.3		105.89625	
11:42:15	677.1		76.17375	
11:42:45	163.5		18.39375	
11:43:15	122		13.725	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

11:43:45	129.3		14.54625	
11:44:15	176.4		19.845	
11:44:45	902		101.475	
11:45:15	901.4		101.4075	
11:45:45	900.9		101.35125	
11:46:15	900		101.25	
11:46:45	910.1		102.38625	
11:47:15	160.7		18.07875	
11:47:45	136.9		15.40125	
11:48:15	111.8		12.5775	
11:48:45	193.9		21.81375	
11:49:15	915.3		102.97125	
11:49:45	922.9		103.82625	
11:50:15	474.3		53.35875	
11:50:45	345		38.8125	
11:51:15	835.5		93.99375	
11:51:45	885.7		99.64125	
11:52:15	884.9		99.55125	
11:52:45	900		101.25	
11:53:15	900.9		101.35125	
11:53:45	898.5		101.08125	
11:54:15	889.7		100.09125	
11:54:45	886.7		99.75375	
11:55:15	883		99.3375	
11:55:45	878.6		98.8425	
11:56:15	881		99.1125	
11:56:45	882.7		99.30375	
11:57:15	886		99.675	
11:57:45	908.8		102.24	
11:58:15	860.8		96.84	
11:58:45	870.5		97.93125	
11:59:15	863.5		97.14375	
11:59:45	869.4		97.8075	
12:00:15	859.9		96.73875	
12:00:45	853.9		96.06375	
12:01:15	863.2		97.11	
12:01:45	871.3		98.02125	
12:02:15	866.5		97.48125	
12:02:45	856.7		96.37875	
12:03:15	864.8		97.29	
12:03:45	870.8		97.965	
12:04:15	892.8		100.44	



12:04:45	925		104.0625	
12:05:15	135.8		15.2775	
12:05:45	813.7		91.54125	
12:06:15	875.4		98.4825	
12:06:45	874.5		98.38125	
12:07:15	893.6		100.53	
12:07:45	833.6		93.78	
12:08:15	884.4		99.495	
12:08:45	862.9		97.07625	
12:09:15	857.8		96.5025	
12:09:45	852.8		95.94	
12:10:15	847.5		95.34375	
12:10:45	845.5		95.11875	
12:11:15	851.8		95.8275	
12:11:45	853.6		96.03	
12:12:15	850.4		95.67	
12:12:45	850.1		95.63625	
12:13:15	851.5		95.79375	
12:13:45	855.3		96.22125	
12:14:15	858.6		96.5925	
12:14:45	858.5		96.58125	
12:15:15	854.7		96.15375	
12:15:45	869.2		97.785	
12:16:15	872.2		98.1225	
12:16:45	865.1		97.32375	
12:17:15	864.6		97.2675	
12:17:45	864.8		97.29	
12:18:15	858.9		96.62625	
12:18:45	852.3		95.88375	
12:19:15	852.5		95.90625	
12:19:45	857.8		96.5025	
12:20:15	856.4		96.345	
12:20:45	856.4		96.345	
12:21:15	859.3		96.67125	
12:21:45	867.2		97.56	
12:22:15	348.5		39.20625	
12:22:45	860.4		96.795	
12:23:15	850.9		95.72625	
12:23:45	850.9		95.72625	
12:24:15	847.7		95.36625	
12:24:45	848.7		95.47875	
12:25:15	848.8		95.49	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:25:45	806.1		90.68625	
12:26:15	849		95.5125	
12:26:45	841.7		94.69125	
12:27:15	843.9		94.93875	
12:27:45	845.5		95.11875	
12:28:15	843		94.8375	
12:28:45	846.8		95.265	
12:29:15	843.9		94.93875	
12:29:45	846		95.175	
12:30:15	840.3		94.53375	
12:30:45	844.2		94.9725	
12:31:15	854.2		96.0975	
12:31:45	852		95.85	
12:32:15	848.5		95.45625	
12:32:45	855.9		96.28875	
12:33:15	859.3		96.67125	
12:33:45	849.1		95.52375	
12:34:15	843.6		94.905	
12:34:45	843		94.8375	
12:35:15	841.8		94.7025	
12:35:45	841.5		94.66875	
12:36:15	844.1		94.96125	
12:36:45	846.4		95.22	
12:37:15	850.7		95.70375	
12:37:45	854.4		96.12	
12:38:15	852		95.85	
12:38:45	836.6		94.1175	
12:39:15	843.4		94.8825	
12:39:45	847.2		95.31	
12:40:15	849		95.5125	
12:40:45	852.3		95.88375	
12:41:15	851.5		95.79375	
12:41:45	842.8		94.815	
12:42:15	834.2		93.8475	
12:42:45	833		93.7125	
12:43:15	823.8		92.6775	
12:43:45	828.7		93.22875	
12:44:15	830.8		93.465	
12:44:45	837.1		94.17375	
12:45:15	849.3		95.54625	
12:45:45	836.9		94.15125	
12:46:15	828.2		93.1725	

12:46:45	822.2	92.4975	
12:47:15	832.2	93.6225	
12:47:45	840.4	94.545	
12:48:15	848.3	95.43375	
12:48:45	830.4	93.42	
12:49:15	826.2	92.9475	
12:49:45	827.7	93.11625	
12:50:15	826.5	92.98125	
12:50:45	824.4	92.745	
12:51:15	820	92.25	
12:51:45	817.5	91.96875	
12:52:15	813.7	91.54125	
12:52:45	812.5	91.40625	
12:53:15	810	91.125	
12:53:45	821.3	92.39625	
12:54:15	827.4	93.0825	
12:54:45	839.6	94.455	
12:55:15	848.7	95.47875	
12:55:45	850.7	95.70375	
12:56:15	841.7	94.69125	
12:56:45	837.7	94.24125	
12:57:15	832.3	93.63375	
12:57:45	834.1	93.83625	
12:58:15	840.3	94.53375	
12:58:45	865.4	97.3575	
12:59:15	864.5	97.25625	
12:59:45	855.9	96.28875	
13:00:15	845.2	95.085	
13:00:45	820.3	92.28375	
13:01:15	811.6	91.305	
13:01:45	810.2	91.1475	
13:02:15	808.7	90.97875	
13:02:45	810	91.125	
13:03:15	815.9	91.78875	
13:03:45	817.8	92.0025	
13:04:15	815.4	91.7325	
13:04:45	816.5	91.85625	
13:05:15	825.2	92.835	
13:05:45	823.5	92.64375	
13:06:15	822	92.475	
13:06:45	767.4	86.3325	
13:07:15	762.5	85.78125	



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13:07:45	801		90.1125	
13:08:15	795.3		89.47125	
13:08:45	790.4		88.92	
13:09:15	789.9		88.86375	
13:09:45	788.9		88.75125	
13:10:15	790.1		88.88625	
13:10:45	791		88.9875	
13:11:15	792		89.1	
13:11:45	797.3		89.69625	
13:12:15	795.1		89.44875	
13:12:45	800.2		90.0225	
13:13:15	803.2		90.36	
13:13:45	815.4		91.7325	
13:14:15	811.9		91.33875	
13:14:45	819.8		92.2275	
13:15:15	811.9		91.33875	
13:15:45	803.2		90.36	
13:16:15	799.4		89.9325	
13:16:45	791.8		89.0775	
13:17:15	793.4		89.2575	
13:17:45	796.2		89.5725	
13:18:15	805.3		90.59625	
13:18:45	804.6		90.5175	
13:19:15	205.5		23.11875	
13:19:45	166.1		18.68625	
13:20:15	205.8		23.1525	
13:20:45	799.7		89.96625	
13:21:15	783.6		88.155	
13:21:45	787.2		88.56	
13:22:15	790.4		88.92	
13:22:45	785.8		88.4025	
13:23:15	778.7		87.60375	
13:23:45	779.9		87.73875	
13:24:15	778.3		87.55875	
13:24:45	779.1		87.64875	
13:25:15	779.6		87.705	
13:25:45	777.9		87.51375	
13:26:15	775.5		87.24375	
13:26:45	782.9		88.07625	
13:27:15	372		41.85	
13:27:45	781.2		87.885	
13:28:15	774.1		87.08625	

13:28:45	775.6		87.255	
13:29:15	780.6		87.8175	
13:29:45	781.8		87.9525	
13:30:15	783.9		88.18875	
13:30:45	173.4		19.5075	
13:31:15	801.8		90.2025	
13:31:45	295		33.1875	
13:32:15	837.7		94.24125	
13:32:45	183		20.5875	
13:33:15	137.9		15.51375	
13:33:45	153.4		17.2575	
13:34:15	760.3		85.53375	
13:34:45	747.8		84.1275	
13:35:15	738.9		83.12625	
13:35:45	738.9		83.12625	
13:36:15	734.2		82.5975	
13:36:45	734.6		82.6425	
13:37:15	736.5		82.85625	
13:37:45	732.6		82.4175	
13:38:15	739.9		83.23875	
13:38:45	731.5		82.29375	
13:39:15	738.6		83.0925	
13:39:45	744.6		83.7675	
13:40:15	740.6		83.3175	
13:40:45	750.1		84.38625	
13:41:15	744.1		83.71125	
13:41:45	725.8		81.6525	
13:42:15	720.1		81.01125	
13:42:45	721.6		81.18	
13:43:15	715.1		80.44875	
13:43:45	710.4		79.92	
13:44:15	716.3		80.58375	
13:44:45	712		80.1	
13:45:15	706.9		79.52625	
13:45:45	707.7		79.61625	
13:46:15	712.8		80.19	
13:46:45	706.9		79.52625	
13:47:15	708.2		79.6725	
13:47:45	703		79.0875	
13:48:15	704.4		79.245	
13:48:45	708		79.65	
13:49:15	707.4		79.5825	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

13:49:45	702.3		79.00875	
13:50:15	703.1		79.09875	
13:50:45	702.8		79.065	
13:51:15	703.1		79.09875	
13:51:45	701.1		78.87375	
13:52:15	695.5		78.24375	
13:52:45	697.9		78.51375	
13:53:15	701.2		78.885	
13:53:45	696.3		78.33375	
13:54:15	693.1		77.97375	
13:54:45	691.7		77.81625	
13:55:15	690.8		77.715	
13:55:45	684.9		77.05125	
13:56:15	682		76.725	
13:56:45	678.6		76.3425	
13:57:15	680.1		76.51125	
13:57:45	672.9		75.70125	
13:58:15	679.2		76.41	
13:58:45	679.4		76.4325	
13:59:15	678.6		76.3425	
13:59:45	673.2		75.735	
14:00:15	670.6		75.4425	
14:00:45	664.8		74.79	
14:01:15	664.3		74.73375	
14:01:45	665.3		74.84625	
14:02:15	657.7		73.99125	
14:02:45	662.1		74.48625	
14:03:15	667.8		75.1275	
14:03:45	616.5		69.35625	
14:04:15	654.3		73.60875	
14:04:45	653.5		73.51875	
14:05:15	658.4		74.07	
14:05:45	654.8		73.665	
14:06:15	657.2		73.935	
14:06:45	656.4		73.845	
14:07:15	649.4		73.0575	
14:07:45	656.7		73.87875	
14:08:15	656.9		73.90125	
14:08:45	652		73.35	
14:09:15	654.3		73.60875	
14:09:45	650.8		73.215	
14:10:15	655.1		73.69875	

14:10:45	647.5	72.84375
14:11:15	644	72.45
14:11:45	643.9	72.43875
14:12:15	646.7	72.75375
14:12:45	633.6	71.28
14:13:15	639.9	71.98875
14:13:45	637.4	71.7075
14:14:15	638.3	71.80875
14:14:45	633.7	71.29125
14:15:15	635.6	71.505
14:15:45	629.8	70.8525
14:16:15	624.2	70.2225
14:16:45	630.1	70.88625
14:17:15	630.4	70.92
14:17:45	626.8	70.515
14:18:15	630.6	70.9425
14:18:45	627.3	70.57125
14:19:15	626	70.425
14:19:45	623.4	70.1325
14:20:15	619.8	69.7275
14:20:45	618.7	69.60375
14:21:15	611.1	68.74875
14:21:45	615.2	69.21
14:22:15	613	68.9625
14:22:45	614.1	69.08625
14:23:15	613.5	69.01875
14:23:45	609.4	68.5575
14:24:15	609.2	68.535
14:24:45	608.1	68.41125
14:25:15	605.4	68.1075
14:25:45	600.2	67.5225
14:26:15	596.2	67.0725
14:26:45	600.5	67.55625
14:27:15	592.6	66.6675
14:27:45	596.7	67.12875
14:28:15	595.3	66.97125
14:28:45	588.9	66.25125
14:29:15	584	65.7
14:29:45	589.1	66.27375
14:30:15	588	66.15
14:30:45	582.4	65.52
14:31:15	583.1	65.59875



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14:31:45	583.1		65.59875	
14:32:15	580.2		65.2725	
14:32:45	576.7		64.87875	
14:33:15	582		65.475	
14:33:45	581.5		65.41875	
14:34:15	580.8		65.34	
14:34:45	577.7		64.99125	
14:35:15	574.5		64.63125	
14:35:45	571.5		64.29375	
14:36:15	573.9		64.56375	
14:36:45	575		64.6875	
14:37:15	573.2		64.485	
14:37:45	572.6		64.4175	
14:38:15	568.5		63.95625	
14:38:45	565.8		63.6525	
14:39:15	561.2		63.135	
14:39:45	555.4		62.4825	
14:40:15	558.4		62.82	
14:40:45	557.3		62.69625	
14:41:15	556		62.55	
14:41:45	554.7		62.40375	
14:42:15	550.1		61.88625	
14:42:45	547.7		61.61625	
14:43:15	547.3		61.57125	
14:43:45	543.2		61.11	
14:44:15	544.3		61.23375	
14:44:45	537		60.4125	
14:45:15	537.8		60.5025	
14:45:45	538.2		60.5475	
14:46:15	541.1		60.87375	
14:46:45	532.7		59.92875	
14:47:15	529.9		59.61375	
14:47:45	535.2		60.21	
14:48:15	532.1		59.86125	
14:48:45	529.5		59.56875	
14:49:15	533.3		59.99625	
14:49:45	531.1		59.74875	
14:50:15	531		59.7375	
14:50:45	521.5		58.66875	
14:51:15	524.8		59.04	
14:51:45	524.3		58.98375	
14:52:15	523.8		58.9275	



14:52:45	518		58.275	
14:53:15	515.6		58.005	
14:53:45	515.6		58.005	
14:54:15	511.6		57.555	
14:54:45	508.6		57.2175	
14:55:15	501.2		56.385	
14:55:45	501.5		56.41875	
14:56:15	503.1		56.59875	
14:56:45	504.4		56.745	
14:57:15	502.9		56.57625	
14:57:45	502.1		56.48625	
14:58:15	504.5		56.75625	
14:58:45	490.7		55.20375	
14:59:15	486.5		54.73125	
14:59:45	486.6		54.7425	
Average	<b>748.425</b>		<b>84.1978125</b>	



**Appendix Table 7, Daily solar irradiance 26 June 2019**

Site Name:	Syafira hotel Rooftop	Date:	26/06/2019	Equipment:
Location:				
	Lat:	Long:		
Elevation:	± 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m <sup>2</sup> )	Air Temperature (degree C)	PV Power output (W/m <sup>2</sup> )	Remark
09:00:15	544.9		61.30125	
09:00:45	551.9		62.08875	
09:01:15	551.7		62.06625	
09:01:45	558		62.775	
09:02:15	563.6		63.405	
09:02:45	565.2		63.585	
09:03:15	564.1		63.46125	
09:03:45	568.7		63.97875	
09:04:15	570.4		64.17	
09:04:45	576.4		64.845	
09:05:15	581.3		65.39625	
09:05:45	581.6		65.43	
09:06:15	586.5		65.98125	
09:06:45	588		66.15	
09:07:15	591.1		66.49875	
09:07:45	588.6		66.2175	
09:08:15	592.9		66.70125	
09:08:45	600		67.5	
09:09:15	605.4		68.1075	
09:09:45	608.9		68.50125	
09:10:15	609.7		68.59125	
09:10:45	605.9		68.16375	
09:11:15	610		68.625	
09:11:45	616		69.3	
09:12:15	626.5		70.48125	
09:12:45	639.3		71.92125	
09:13:15	651.8		73.3275	
09:13:45	660		74.25	
09:14:15	679.7		76.46625	
09:14:45	701.5		78.91875	
09:15:15	704.7		79.27875	
09:15:45	698.8		78.615	
09:16:15	683		76.8375	

09:16:45	681.9		76.71375	
09:17:15	686.8		77.265	
09:17:45	694.4		78.12	
09:18:15	701.8		78.9525	
09:18:45	688.4		77.445	
09:19:15	715.6		80.505	
09:19:45	703.9		79.18875	
09:20:15	708		79.65	
09:20:45	723.9		81.43875	
09:21:15	741.1		83.37375	
09:21:45	736.2		82.8225	
09:22:15	745.4		83.8575	
09:22:45	746.7		84.00375	
09:23:15	737.6		82.98	
09:23:45	747.3		84.07125	
09:24:15	737.2		82.935	
09:24:45	734.6		82.6425	
09:25:15	743.7		83.66625	
09:25:45	757.4		85.2075	
09:26:15	769.9		86.61375	
09:26:45	780.4		87.795	
09:27:15	787.8		88.6275	
09:27:45	787.2		88.56	
09:28:15	798.4		89.82	
09:28:45	243.7		27.41625	
09:29:15	338.1		38.03625	
09:29:45	780.2		87.7725	
09:30:15	750		84.375	
09:30:45	255.4		28.7325	
09:31:15	348		39.15	
09:31:45	779.4		87.6825	
09:32:15	630.4		70.92	
09:32:45	329.8		37.1025	
09:33:15	259.2		29.16	
09:33:45	793.1		89.22375	
09:34:15	785.6		88.38	
09:34:45	791.3		89.02125	
09:35:15	795.4		89.4825	
09:35:45	578.5		65.08125	
09:36:15	265.7		29.89125	
09:36:45	547.9		61.63875	
09:37:15	831.2		93.51	



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09:37:45	841.1		94.62375	
09:38:15	415		46.6875	
09:38:45	191.7		21.56625	
09:39:15	176.5		19.85625	
09:39:45	222		24.975	
09:40:15	392.2		44.1225	
09:40:45	693.6		78.03	
09:41:15	805.4		90.6075	
09:41:45	820.5		92.30625	
09:42:15	431.5		48.54375	
09:42:45	438.2		49.2975	
09:43:15	822.7		92.55375	
09:43:45	443.9		49.93875	
09:44:15	185.7		20.89125	
09:44:45	236.9		26.65125	
09:45:15	674		75.825	
09:45:45	658		74.025	
09:46:15	199.3		22.42125	
09:46:45	226.6		25.4925	
09:47:15	169.9		19.11375	
09:47:45	547.1		61.54875	
09:48:15	222		24.975	
09:48:45	318		35.775	
09:49:15	241.6		27.18	
09:49:45	182.2		20.4975	
09:50:15	165.1		18.57375	
09:50:45	179.4		20.1825	
09:51:15	776.9		87.40125	
09:51:45	775.5		87.24375	
09:52:15	786.7		88.50375	
09:52:45	804.6		90.5175	
09:53:15	738.1		83.03625	
09:53:45	780.2		87.7725	
09:54:15	773.1		86.97375	
09:54:45	772.5		86.90625	
09:55:15	764.7		86.02875	
09:55:45	747.6		84.105	
09:56:15	754.7		84.90375	
09:56:45	771.2		86.76	
09:57:15	781.8		87.9525	
09:57:45	138.7		15.60375	
09:58:15	157.2		17.685	

09:58:45	512.3		57.63375	
09:59:15	820.6		92.3175	
09:59:45	608.7		68.47875	
10:00:15	790.1		88.88625	
10:00:45	778.3		87.55875	
10:01:15	765.2		86.085	
10:01:45	649.1		73.02375	
10:02:15	775.6		87.255	
10:02:45	741.3		83.39625	
10:03:15	141.2		15.885	
10:03:45	144.7		16.27875	
10:04:15	228		25.65	
10:04:45	835.2		93.96	
10:05:15	817.3		91.94625	
10:05:45	813.3		91.49625	
10:06:15	821.9		92.46375	
10:06:45	850.1		95.63625	
10:07:15	210.6		23.6925	
10:07:45	820.5		92.30625	
10:08:15	570.1		64.13625	
10:08:45	385.4		43.3575	
10:09:15	477.7		53.74125	
10:09:45	777.7		87.49125	
10:10:15	758.4		85.32	
10:10:45	758.1		85.28625	
10:11:15	755.1		84.94875	
10:11:45	753.9		84.81375	
10:12:15	757.6		85.23	
10:12:45	769.6		86.58	
10:13:15	777.2		87.435	
10:13:45	780.6		87.8175	
10:14:15	805.3		90.59625	
10:14:45	797.3		89.69625	
10:15:15	785		88.3125	
10:15:45	776.8		87.39	
10:16:15	788		88.65	
10:16:45	797.8		89.7525	
10:17:15	799.2		89.91	
10:17:45	800		90	
10:18:15	799.6		89.955	
10:18:45	794.6		89.3925	
10:19:15	790.2		88.8975	



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10:19:45	786.1		88.43625	
10:20:15	767.9		86.38875	
10:20:45	775		87.1875	
10:21:15	774.2		87.0975	
10:21:45	766.8		86.265	
10:22:15	772.3		86.88375	
10:22:45	778.8		87.615	
10:23:15	793.4		89.2575	
10:23:45	799.2		89.91	
10:24:15	806.2		90.6975	
10:24:45	799.6		89.955	
10:25:15	829.2		93.285	
10:25:45	810.2		91.1475	
10:26:15	671		75.4875	
10:26:45	802.9		90.32625	
10:27:15	806.8		90.765	
10:27:45	828.4		93.195	
10:28:15	803.4		90.3825	
10:28:45	856.1		96.31125	
10:29:15	864		97.2	
10:29:45	863.9		97.18875	
10:30:15	886.2		99.6975	
10:30:45	803.7		90.41625	
10:31:15	754.3		84.85875	
10:31:45	882.7		99.30375	
10:32:15	861.2		96.885	
10:32:45	846.6		95.2425	
10:33:15	857		96.4125	
10:33:45	874.6		98.3925	
10:34:15	877.8		98.7525	
10:34:45	870		97.875	
10:35:15	882.7		99.30375	
10:35:45	890.5		100.18125	
10:36:15	808.7		90.97875	
10:36:45	848.5		95.45625	
10:37:15	899.5		101.19375	
10:37:45	909.8		102.3525	
10:38:15	891.7		100.31625	
10:38:45	874		98.325	
10:39:15	871.6		98.055	
10:39:45	864.6		97.2675	
10:40:15	683.9		76.93875	

10:40:45	874.6		98.3925	
10:41:15	871.6		98.055	
10:41:45	613.9		69.06375	
10:42:15	882.2		99.2475	
10:42:45	564.2		63.4725	
10:43:15	881.8		99.2025	
10:43:45	865.6		97.38	
10:44:15	853.9		96.06375	
10:44:45	857.5		96.46875	
10:45:15	872.9		98.20125	
10:45:45	866.2		97.4475	
10:46:15	862.9		97.07625	
10:46:45	173.7		19.54125	
10:47:15	812.2		91.3725	
10:47:45	804		90.45	
10:48:15	819.5		92.19375	
10:48:45	818.4		92.07	
10:49:15	840.3		94.53375	
10:49:45	837.7		94.24125	
10:50:15	833.8		93.8025	
10:50:45	842.5		94.78125	
10:51:15	859.4		96.6825	
10:51:45	211.2		23.76	
10:52:15	242.6		27.2925	
10:52:45	878.3		98.80875	
10:53:15	885.7		99.64125	
10:53:45	774.5		87.13125	
10:54:15	864.8		97.29	
10:54:45	867.5		97.59375	
10:55:15	866.7		97.50375	
10:55:45	883		99.3375	
10:56:15	508.3		57.18375	
10:56:45	892.8		100.44	
10:57:15	867.3		97.57125	
10:57:45	854.4		96.12	
10:58:15	846.4		95.22	
10:58:45	847.5		95.34375	
10:59:15	848.5		95.45625	
10:59:45	443.9		49.93875	
11:00:15	831.5		93.54375	
11:00:45	833.3		93.74625	
11:01:15	837.7		94.24125	



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11:01:45	839.3		94.42125	
11:02:15	836.6		94.1175	
11:02:45	833.6		93.78	
11:03:15	835.7		94.01625	
11:03:45	833.4		93.7575	
11:04:15	838		94.275	
11:04:45	839.5		94.44375	
11:05:15	839.9		94.48875	
11:05:45	840.9		94.60125	
11:06:15	840.1		94.51125	
11:06:45	850.4		95.67	
11:07:15	860.4		96.795	
11:07:45	868		97.65	
11:08:15	878.4		98.82	
11:08:45	884.6		99.5175	
11:09:15	880.5		99.05625	
11:09:45	909.6		102.33	
11:10:15	890		100.125	
11:10:45	898.9		101.12625	
11:11:15	872.7		98.17875	
11:11:45	864.8		97.29	
11:12:15	862.1		96.98625	
11:12:45	860.8		96.84	
11:13:15	867.3		97.57125	
11:13:45	869.6		97.83	
11:14:15	868.4		97.695	
11:14:45	868.9		97.75125	
11:15:15	876.5		98.60625	
11:15:45	881.1		99.12375	
11:16:15	880.6		99.0675	
11:16:45	876.8		98.64	
11:17:15	877.2		98.685	
11:17:45	869.4		97.8075	
11:18:15	868.8		97.74	
11:18:45	869.4		97.8075	
11:19:15	865.8		97.4025	
11:19:45	866.5		97.48125	
11:20:15	864		97.2	
11:20:45	863.4		97.1325	
11:21:15	875.3		98.47125	
11:21:45	889.2		100.035	
11:22:15	899.5		101.19375	



11:22:45	907.2		102.06	
11:23:15	900.1		101.26125	
11:23:45	901.1		101.37375	
11:24:15	895.2		100.71	
11:24:45	899.5		101.19375	
11:25:15	908.5		102.20625	
11:25:45	901.1		101.37375	
11:26:15	908.5		102.20625	
11:26:45	590.7		66.45375	
11:27:15	189		21.2625	
11:27:45	914.1		102.83625	
11:28:15	901.2		101.385	
11:28:45	894.1		100.58625	
11:29:15	894.1		100.58625	
11:29:45	895.8		100.7775	
11:30:15	896.2		100.8225	
11:30:45	892.8		100.44	
11:31:15	895.8		100.7775	
11:31:45	896.8		100.89	
11:32:15	902.3		101.50875	
11:32:45	904.4		101.745	
11:33:15	881		99.1125	
11:33:45	907.4		102.0825	
11:34:15	911.4		102.5325	
11:34:45	900.6		101.3175	
11:35:15	912.2		102.6225	
11:35:45	911.5		102.54375	
11:36:15	907.6		102.105	
11:36:45	923.4		103.8825	
11:37:15	934.6		105.1425	
11:37:45	392.9		44.20125	
11:38:15	929.6		104.58	
11:38:45	909.3		102.29625	
11:39:15	900.6		101.3175	
11:39:45	885.6		99.63	
11:40:15	913.7		102.79125	
11:40:45	899.6		101.205	
11:41:15	907.4		102.0825	
11:41:45	941.3		105.89625	
11:42:15	677.1		76.17375	
11:42:45	163.5		18.39375	
11:43:15	122		13.725	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

11:43:45	129.3		14.54625	
11:44:15	176.4		19.845	
11:44:45	902		101.475	
11:45:15	901.4		101.4075	
11:45:45	900.9		101.35125	
11:46:15	900		101.25	
11:46:45	910.1		102.38625	
11:47:15	160.7		18.07875	
11:47:45	136.9		15.40125	
11:48:15	111.8		12.5775	
11:48:45	193.9		21.81375	
11:49:15	915.3		102.97125	
11:49:45	922.9		103.82625	
11:50:15	474.3		53.35875	
11:50:45	345		38.8125	
11:51:15	835.5		93.99375	
11:51:45	885.7		99.64125	
11:52:15	884.9		99.55125	
11:52:45	900		101.25	
11:53:15	900.9		101.35125	
11:53:45	898.5		101.08125	
11:54:15	889.7		100.09125	
11:54:45	886.7		99.75375	
11:55:15	883		99.3375	
11:55:45	878.6		98.8425	
11:56:15	881		99.1125	
11:56:45	882.7		99.30375	
11:57:15	886		99.675	
11:57:45	908.8		102.24	
11:58:15	860.8		96.84	
11:58:45	870.5		97.93125	
11:59:15	863.5		97.14375	
11:59:45	869.4		97.8075	
12:00:15	859.9		96.73875	
12:00:45	853.9		96.06375	
12:01:15	863.2		97.11	
12:01:45	871.3		98.02125	
12:02:15	866.5		97.48125	
12:02:45	856.7		96.37875	
12:03:15	864.8		97.29	
12:03:45	870.8		97.965	
12:04:15	892.8		100.44	

12:04:45	925		104.0625	
12:05:15	135.8		15.2775	
12:05:45	813.7		91.54125	
12:06:15	875.4		98.4825	
12:06:45	874.5		98.38125	
12:07:15	893.6		100.53	
12:07:45	833.6		93.78	
12:08:15	884.4		99.495	
12:08:45	862.9		97.07625	
12:09:15	857.8		96.5025	
12:09:45	852.8		95.94	
12:10:15	847.5		95.34375	
12:10:45	845.5		95.11875	
12:11:15	851.8		95.8275	
12:11:45	853.6		96.03	
12:12:15	850.4		95.67	
12:12:45	850.1		95.63625	
12:13:15	851.5		95.79375	
12:13:45	855.3		96.22125	
12:14:15	858.6		96.5925	
12:14:45	858.5		96.58125	
12:15:15	854.7		96.15375	
12:15:45	869.2		97.785	
12:16:15	872.2		98.1225	
12:16:45	865.1		97.32375	
12:17:15	864.6		97.2675	
12:17:45	864.8		97.29	
12:18:15	858.9		96.62625	
12:18:45	852.3		95.88375	
12:19:15	852.5		95.90625	
12:19:45	857.8		96.5025	
12:20:15	856.4		96.345	
12:20:45	856.4		96.345	
12:21:15	859.3		96.67125	
12:21:45	867.2		97.56	
12:22:15	348.5		39.20625	
12:22:45	860.4		96.795	
12:23:15	850.9		95.72625	
12:23:45	850.9		95.72625	
12:24:15	847.7		95.36625	
12:24:45	848.7		95.47875	
12:25:15	848.8		95.49	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

12:25:45	806.1		90.68625	
12:26:15	849		95.5125	
12:26:45	841.7		94.69125	
12:27:15	843.9		94.93875	
12:27:45	845.5		95.11875	
12:28:15	843		94.8375	
12:28:45	846.8		95.265	
12:29:15	843.9		94.93875	
12:29:45	846		95.175	
12:30:15	840.3		94.53375	
12:30:45	844.2		94.9725	
12:31:15	854.2		96.0975	
12:31:45	852		95.85	
12:32:15	848.5		95.45625	
12:32:45	855.9		96.28875	
12:33:15	859.3		96.67125	
12:33:45	849.1		95.52375	
12:34:15	843.6		94.905	
12:34:45	843		94.8375	
12:35:15	841.8		94.7025	
12:35:45	841.5		94.66875	
12:36:15	844.1		94.96125	
12:36:45	846.4		95.22	
12:37:15	850.7		95.70375	
12:37:45	854.4		96.12	
12:38:15	852		95.85	
12:38:45	836.6		94.1175	
12:39:15	843.4		94.8825	
12:39:45	847.2		95.31	
12:40:15	849		95.5125	
12:40:45	852.3		95.88375	
12:41:15	851.5		95.79375	
12:41:45	842.8		94.815	
12:42:15	834.2		93.8475	
12:42:45	833		93.7125	
12:43:15	823.8		92.6775	
12:43:45	828.7		93.22875	
12:44:15	830.8		93.465	
12:44:45	837.1		94.17375	
12:45:15	849.3		95.54625	
12:45:45	836.9		94.15125	
12:46:15	828.2		93.1725	

12:46:45	822.2		92.4975	
12:47:15	832.2		93.6225	
12:47:45	840.4		94.545	
12:48:15	848.3		95.43375	
12:48:45	830.4		93.42	
12:49:15	826.2		92.9475	
12:49:45	827.7		93.11625	
12:50:15	826.5		92.98125	
12:50:45	824.4		92.745	
12:51:15	820		92.25	
12:51:45	817.5		91.96875	
12:52:15	813.7		91.54125	
12:52:45	812.5		91.40625	
12:53:15	810		91.125	
12:53:45	821.3		92.39625	
12:54:15	827.4		93.0825	
12:54:45	839.6		94.455	
12:55:15	848.7		95.47875	
12:55:45	850.7		95.70375	
12:56:15	841.7		94.69125	
12:56:45	837.7		94.24125	
12:57:15	832.3		93.63375	
12:57:45	834.1		93.83625	
12:58:15	840.3		94.53375	
12:58:45	865.4		97.3575	
12:59:15	864.5		97.25625	
12:59:45	855.9		96.28875	
13:00:15	845.2		95.085	
13:00:45	820.3		92.28375	
13:01:15	811.6		91.305	
13:01:45	810.2		91.1475	
13:02:15	808.7		90.97875	
13:02:45	810		91.125	
13:03:15	815.9		91.78875	
13:03:45	817.8		92.0025	
13:04:15	815.4		91.7325	
13:04:45	816.5		91.85625	
13:05:15	825.2		92.835	
13:05:45	823.5		92.64375	
13:06:15	822		92.475	
13:06:45	767.4		86.3325	
13:07:15	762.5		85.78125	



## Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

13:07:45	801		90.1125	
13:08:15	795.3		89.47125	
13:08:45	790.4		88.92	
13:09:15	789.9		88.86375	
13:09:45	788.9		88.75125	
13:10:15	790.1		88.88625	
13:10:45	791		88.9875	
13:11:15	792		89.1	
13:11:45	797.3		89.69625	
13:12:15	795.1		89.44875	
13:12:45	800.2		90.0225	
13:13:15	803.2		90.36	
13:13:45	815.4		91.7325	
13:14:15	811.9		91.33875	
13:14:45	819.8		92.2275	
13:15:15	811.9		91.33875	
13:15:45	803.2		90.36	
13:16:15	799.4		89.9325	
13:16:45	791.8		89.0775	
13:17:15	793.4		89.2575	
13:17:45	796.2		89.5725	
13:18:15	805.3		90.59625	
13:18:45	804.6		90.5175	
13:19:15	205.5		23.11875	
13:19:45	166.1		18.68625	
13:20:15	205.8		23.1525	
13:20:45	799.7		89.96625	
13:21:15	783.6		88.155	
13:21:45	787.2		88.56	
13:22:15	790.4		88.92	
13:22:45	785.8		88.4025	
13:23:15	778.7		87.60375	
13:23:45	779.9		87.73875	
13:24:15	778.3		87.55875	
13:24:45	779.1		87.64875	
13:25:15	779.6		87.705	
13:25:45	777.9		87.51375	
13:26:15	775.5		87.24375	
13:26:45	782.9		88.07625	
13:27:15	372		41.85	
13:27:45	781.2		87.885	
13:28:15	774.1		87.08625	

13:28:45	775.6		87.255	
13:29:15	780.6		87.8175	
13:29:45	781.8		87.9525	
13:30:15	783.9		88.18875	
13:30:45	173.4		19.5075	
13:31:15	801.8		90.2025	
13:31:45	295		33.1875	
13:32:15	837.7		94.24125	
13:32:45	183		20.5875	
13:33:15	137.9		15.51375	
13:33:45	153.4		17.2575	
13:34:15	760.3		85.53375	
13:34:45	747.8		84.1275	
13:35:15	738.9		83.12625	
13:35:45	738.9		83.12625	
13:36:15	734.2		82.5975	
13:36:45	734.6		82.6425	
13:37:15	736.5		82.85625	
13:37:45	732.6		82.4175	
13:38:15	739.9		83.23875	
13:38:45	731.5		82.29375	
13:39:15	738.6		83.0925	
13:39:45	744.6		83.7675	
13:40:15	740.6		83.3175	
13:40:45	750.1		84.38625	
13:41:15	744.1		83.71125	
13:41:45	725.8		81.6525	
13:42:15	720.1		81.01125	
13:42:45	721.6		81.18	
13:43:15	715.1		80.44875	
13:43:45	710.4		79.92	
13:44:15	716.3		80.58375	
13:44:45	712		80.1	
13:45:15	706.9		79.52625	
13:45:45	707.7		79.61625	
13:46:15	712.8		80.19	
13:46:45	706.9		79.52625	
13:47:15	708.2		79.6725	
13:47:45	703		79.0875	
13:48:15	704.4		79.245	
13:48:45	708		79.65	
13:49:15	707.4		79.5825	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

13:49:45	702.3		79.00875	
13:50:15	703.1		79.09875	
13:50:45	702.8		79.065	
13:51:15	703.1		79.09875	
13:51:45	701.1		78.87375	
13:52:15	695.5		78.24375	
13:52:45	697.9		78.51375	
13:53:15	701.2		78.885	
13:53:45	696.3		78.33375	
13:54:15	693.1		77.97375	
13:54:45	691.7		77.81625	
13:55:15	690.8		77.715	
13:55:45	684.9		77.05125	
13:56:15	682		76.725	
13:56:45	678.6		76.3425	
13:57:15	680.1		76.51125	
13:57:45	672.9		75.70125	
13:58:15	679.2		76.41	
13:58:45	679.4		76.4325	
13:59:15	678.6		76.3425	
13:59:45	673.2		75.735	
14:00:15	670.6		75.4425	
14:00:45	664.8		74.79	
14:01:15	664.3		74.73375	
14:01:45	665.3		74.84625	
14:02:15	657.7		73.99125	
14:02:45	662.1		74.48625	
14:03:15	667.8		75.1275	
14:03:45	616.5		69.35625	
14:04:15	654.3		73.60875	
14:04:45	653.5		73.51875	
14:05:15	658.4		74.07	
14:05:45	654.8		73.665	
14:06:15	657.2		73.935	
14:06:45	656.4		73.845	
14:07:15	649.4		73.0575	
14:07:45	656.7		73.87875	
14:08:15	656.9		73.90125	
14:08:45	652		73.35	
14:09:15	654.3		73.60875	
14:09:45	650.8		73.215	
14:10:15	655.1		73.69875	



14:10:45	647.5		72.84375	
14:11:15	644		72.45	
14:11:45	643.9		72.43875	
14:12:15	646.7		72.75375	
14:12:45	633.6		71.28	
14:13:15	639.9		71.98875	
14:13:45	637.4		71.7075	
14:14:15	638.3		71.80875	
14:14:45	633.7		71.29125	
14:15:15	635.6		71.505	
14:15:45	629.8		70.8525	
14:16:15	624.2		70.2225	
14:16:45	630.1		70.88625	
14:17:15	630.4		70.92	
14:17:45	626.8		70.515	
14:18:15	630.6		70.9425	
14:18:45	627.3		70.57125	
14:19:15	626		70.425	
14:19:45	623.4		70.1325	
14:20:15	619.8		69.7275	
14:20:45	618.7		69.60375	
14:21:15	611.1		68.74875	
14:21:45	615.2		69.21	
14:22:15	613		68.9625	
14:22:45	614.1		69.08625	
14:23:15	613.5		69.01875	
14:23:45	609.4		68.5575	
14:24:15	609.2		68.535	
14:24:45	608.1		68.41125	
14:25:15	605.4		68.1075	
14:25:45	600.2		67.5225	
14:26:15	596.2		67.0725	
14:26:45	600.5		67.55625	
14:27:15	592.6		66.6675	
14:27:45	596.7		67.12875	
14:28:15	595.3		66.97125	
14:28:45	588.9		66.25125	
14:29:15	584		65.7	
14:29:45	589.1		66.27375	
14:30:15	588		66.15	
14:30:45	582.4		65.52	
14:31:15	583.1		65.59875	



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14:31:45	583.1		65.59875	
14:32:15	580.2		65.2725	
14:32:45	576.7		64.87875	
14:33:15	582		65.475	
14:33:45	581.5		65.41875	
14:34:15	580.8		65.34	
14:34:45	577.7		64.99125	
14:35:15	574.5		64.63125	
14:35:45	571.5		64.29375	
14:36:15	573.9		64.56375	
14:36:45	575		64.6875	
14:37:15	573.2		64.485	
14:37:45	572.6		64.4175	
14:38:15	568.5		63.95625	
14:38:45	565.8		63.6525	
14:39:15	561.2		63.135	
14:39:45	555.4		62.4825	
14:40:15	558.4		62.82	
14:40:45	557.3		62.69625	
14:41:15	556		62.55	
14:41:45	554.7		62.40375	
14:42:15	550.1		61.88625	
14:42:45	547.7		61.61625	
14:43:15	547.3		61.57125	
14:43:45	543.2		61.11	
14:44:15	544.3		61.23375	
14:44:45	537		60.4125	
14:45:15	537.8		60.5025	
14:45:45	538.2		60.5475	
14:46:15	541.1		60.87375	
14:46:45	532.7		59.92875	
14:47:15	529.9		59.61375	
14:47:45	535.2		60.21	
14:48:15	532.1		59.86125	
14:48:45	529.5		59.56875	
14:49:15	533.3		59.99625	
14:49:45	531.1		59.74875	
14:50:15	531		59.7375	
14:50:45	521.5		58.66875	
14:51:15	524.8		59.04	
14:51:45	524.3		58.98375	
14:52:15	523.8		58.9275	

14:52:45	518		58.275	
14:53:15	515.6		58.005	
14:53:45	515.6		58.005	
14:54:15	511.6		57.555	
14:54:45	508.6		57.2175	
14:55:15	501.2		56.385	
14:55:45	501.5		56.41875	
14:56:15	503.1		56.59875	
14:56:45	504.4		56.745	
14:57:15	502.9		56.57625	
14:57:45	502.1		56.48625	
14:58:15	504.5		56.75625	
14:58:45	490.7		55.20375	
14:59:15	486.5		54.73125	
14:59:45	486.6		54.7425	
15:00:15	484.2		54.4725	
15:00:45	484.9		54.55125	
Average	<b>747.5</b>		<b>84.09163578</b>	



**Appendix Table 8, Daily solar irradiance 27 June 2019**

Site Name:	Syafira Hotel Rooftop	Date:	27/06/2019	Equipment:
Location:				
	Lat:	Long:		
Elevation:	± 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m <sup>2</sup> )	Air Temperature (degree C)	PV Power output (W/m <sup>2</sup> )	Remark
09:00:20	226.9		25.52625	
09:00:50	121.4		13.6575	
09:01:20	127.4		14.3325	
09:01:50	147.2		16.56	
09:02:20	145.6		16.38	
09:02:50	143.6		16.155	
09:03:20	142.6		16.0425	
09:03:50	146.4		16.47	
09:04:20	471.9		53.08875	
09:04:50	572.6		64.4175	
09:05:20	615.5		69.24375	
09:05:50	339.8		38.2275	
09:06:20	391.3		44.02125	
09:06:50	159.7		17.96625	
09:07:20	333.9		37.56375	
09:07:50	574.8		64.665	
09:08:20	155.5		17.49375	
09:08:50	149		16.7625	
09:09:20	193.9		21.81375	
09:09:50	163.9		18.43875	
09:10:20	182.5		20.53125	
09:10:50	684.6		77.0175	
09:11:20	666.2		74.9475	
09:11:50	327		36.7875	
09:12:20	645.1		72.57375	
09:12:50	632.5		71.15625	
09:13:20	603		67.8375	
09:13:50	623.9		70.18875	
09:14:20	629.6		70.83	
09:14:50	348.2		39.1725	
09:15:20	128.4		14.445	
09:15:50	122.7		13.80375	
09:16:20	259.5		29.19375	

09:16:50	128.4		14.445	
09:17:20	168.1		18.91125	
09:17:50	663		74.5875	
09:18:20	683.6		76.905	
09:18:50	690.4		77.67	
09:19:20	694.7		78.15375	
09:19:50	189.4		21.3075	
09:20:20	273.1		30.72375	
09:20:50	142.6		16.0425	
09:21:20	141.7		15.94125	
09:21:50	140.9		15.85125	
09:22:20	142.6		16.0425	
09:22:50	161.3		18.14625	
09:23:20	592.7		66.67875	
09:23:50	724.6		81.5175	
09:24:20	756.2		85.0725	
09:24:50	457.5		51.46875	
09:25:20	162.4		18.27	
09:25:50	150.9		16.97625	
09:26:20	162.3		18.25875	
09:26:50	182.2		20.4975	
09:27:20	265.1		29.82375	
09:27:50	283.3		31.87125	
09:28:20	669.5		75.31875	
09:28:50	740.8		83.34	
09:29:20	166.4		18.72	
09:29:50	159.3		17.92125	
09:30:20	219.9		24.73875	
09:30:50	745.2		83.835	
09:31:20	737		82.9125	
09:31:50	731.9		82.33875	
09:32:20	725.1		81.57375	
09:32:50	725		81.5625	
09:33:20	716.1		80.56125	
09:33:50	717		80.6625	
09:34:20	174		19.575	
09:34:50	737.8		83.0025	
09:35:20	618.7		69.60375	
09:35:50	316.7		35.62875	
09:36:20	315.4		35.4825	
09:36:50	541.1		60.87375	
09:37:20	743.2		83.61	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

09:37:50	709.9		79.86375	
09:38:20	708.5		79.70625	
09:38:50	706.4		79.47	
09:39:20	713.1		80.22375	
09:39:50	719.1		80.89875	
09:40:20	717		80.6625	
09:40:50	721.2		81.135	
09:41:20	712.5		80.15625	
09:41:50	705.3		79.34625	
09:42:20	696.6		78.3675	
09:42:50	695.5		78.24375	
09:43:20	702.6		79.0425	
09:43:50	706.4		79.47	
09:44:20	717.4		80.7075	
09:44:50	731.8		82.3275	
09:45:20	754.3		84.85875	
09:45:50	342.7		38.55375	
09:46:20	764.1		85.96125	
09:46:50	296.1		33.31125	
09:47:20	166.2		18.6975	
09:47:50	786.4		88.47	
09:48:20	776.8		87.39	
09:48:50	763.1		85.84875	
09:49:20	204.4		22.995	
09:49:50	586.5		65.98125	
09:50:20	190.9		21.47625	
09:50:50	188.2		21.1725	
09:51:20	206.1		23.18625	
09:51:50	180.6		20.3175	
09:52:20	198.2		22.2975	
09:52:50	225.3		25.34625	
09:53:20	248.1		27.91125	
09:53:50	844.4		94.995	
09:54:20	247.8		27.8775	
09:54:50	235.4		26.4825	
09:55:20	549		61.7625	
09:55:50	808.1		90.91125	
09:56:20	823.8		92.6775	
09:56:50	176.8		19.89	
09:57:20	190.6		21.4425	
09:57:50	181.6		20.43	
09:58:20	820.9		92.35125	

09:58:50	833.6		93.78	
09:59:20	804.6		90.5175	
09:59:50	163.5		18.39375	
10:00:20	829.6		93.33	
10:00:50	860.2		96.7725	
10:01:20	206.8		23.265	
10:01:50	902.8		101.565	
10:02:20	877.2		98.685	
10:02:50	315.9		35.53875	
10:03:20	272.8		30.69	
10:03:50	232.3		26.13375	
10:04:20	861		96.8625	
10:04:50	786.9		88.52625	
10:05:20	816.5		91.85625	
10:05:50	809.5		91.06875	
10:06:20	818.4		92.07	
10:06:50	832.7		93.67875	
10:07:20	574.4		64.62	
10:07:50	554.7		62.40375	
10:08:20	859.7		96.71625	
10:08:50	864.8		97.29	
10:09:20	851.5		95.79375	
10:09:50	489.9		55.11375	
10:10:20	856.6		96.3675	
10:10:50	858.5		96.58125	
10:11:20	849.3		95.54625	
10:11:50	850.2		95.6475	
10:12:20	853.9		96.06375	
10:12:50	859.9		96.73875	
10:13:20	201.7		22.69125	
10:13:50	250.6		28.1925	
10:14:20	246.1		27.68625	
10:14:50	239.2		26.91	
10:15:20	244.6		27.5175	
10:15:50	260.6		29.3175	
10:16:20	260		29.25	
10:16:50	213.9		24.06375	
10:17:20	492.3		55.38375	
10:17:50	887.1		99.79875	
10:18:20	884.1		99.46125	
10:18:50	891.6		100.305	
10:19:20	898.5		101.08125	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

10:19:50	923.1		103.84875	
10:20:20	921		103.6125	
10:20:50	444.8		50.04	
10:21:20	381.5		42.91875	
10:21:50	853.9		96.06375	
10:22:20	844.5		95.00625	
10:22:50	839.5		94.44375	
10:23:20	841.4		94.6575	
10:23:50	851.5		95.79375	
10:24:20	871.3		98.02125	
10:24:50	827.4		93.0825	
10:25:20	864.2		97.2225	
10:25:50	871.6		98.055	
10:26:20	888.1		99.91125	
10:26:50	761.2		85.635	
10:27:20	286.3		32.20875	
10:27:50	239.4		26.9325	
10:28:20	231.6		26.055	
10:28:50	235.3		26.47125	
10:29:20	237.7		26.74125	
10:29:50	249.7		28.09125	
10:30:20	314.3		35.35875	
10:30:50	1002		112.725	
10:31:20	846.1		95.18625	
10:31:50	277.7		31.24125	
10:32:20	754.3		84.85875	
10:32:50	918.2		103.2975	
10:33:20	953.5		107.26875	
10:33:50	431.5		48.54375	
10:34:20	243		27.3375	
10:34:50	276.1		31.06125	
10:35:20	276.6		31.1175	
10:35:50	241		27.1125	
10:36:20	222.9		25.07625	
10:36:50	232.6		26.1675	
10:37:20	959.5		107.94375	
10:37:50	938.9		105.62625	
10:38:20	932.1		104.86125	
10:38:50	921.7		103.69125	
10:39:20	771.4		86.7825	
10:39:50	914.5		102.88125	
10:40:20	916.3		103.08375	



10:40:50	922.3	103.75875	
10:41:20	920.6	103.5675	
10:41:50	912	102.6	
10:42:20	908.4	102.195	
10:42:50	917.9	103.26375	
10:43:20	196.5	22.10625	
10:43:50	923.2	103.86	
10:44:20	364	40.95	
10:44:50	936.1	105.31125	
10:45:20	916	103.05	
10:45:50	895.1	100.69875	
10:46:20	916.3	103.08375	
10:46:50	274.2	30.8475	
10:47:20	284.4	31.995	
10:47:50	269.8	30.3525	
10:48:20	525.9	59.16375	
10:48:50	911	102.4875	
10:49:20	909.9	102.36375	
10:49:50	897.9	101.01375	
10:50:20	897.1	100.92375	
10:50:50	897.7	100.99125	
10:51:20	892.5	100.40625	
10:51:50	900.1	101.26125	
10:52:20	904.1	101.71125	
10:52:50	916.3	103.08375	
10:53:20	913.4	102.7575	
10:53:50	918.7	103.35375	
10:54:20	932.3	104.88375	
10:54:50	928.2	104.4225	
10:55:20	868.8	97.74	
10:55:50	954.1	107.33625	
10:56:20	943.7	106.16625	
10:56:50	850.7	95.70375	
10:57:20	177.2	19.935	
10:57:50	957.6	107.73	
10:58:20	955.1	107.44875	
10:58:50	933.9	105.06375	
10:59:20	922.5	103.78125	
10:59:50	910.6	102.4425	
11:00:20	910.9	102.47625	
11:00:50	898.1	101.03625	
11:01:20	897.9	101.01375	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

11:01:50	905.7		101.89125	
11:02:20	909.6		102.33	
11:02:50	904.4		101.745	
11:03:20	906.1		101.93625	
11:03:50	906.8		102.015	
11:04:20	907.6		102.105	
11:04:50	919.9		103.48875	
11:05:20	704.5		79.25625	
11:05:50	181.1		20.37375	
11:06:20	153.9		17.31375	
11:06:50	159.6		17.955	
11:07:20	165.1		18.57375	
11:07:50	220.6		24.8175	
11:08:20	986.3		110.95875	
11:08:50	968.5		108.95625	
11:09:20	969.2		109.035	
11:09:50	987.5		111.09375	
11:10:20	1014		114.075	
11:10:50	222.1		24.98625	
11:11:20	198.1		22.28625	
11:11:50	199		22.3875	
11:12:20	242.3		27.25875	
11:12:50	1010		113.625	
11:13:20	992.1		111.61125	
11:13:50	977.7		109.99125	
11:14:20	967.9		108.88875	
11:14:50	959		107.8875	
11:15:20	955.6		107.505	
11:15:50	946		106.425	
11:16:20	946		106.425	
11:16:50	964.7		108.52875	
11:17:20	955.2		107.46	
11:17:50	937.7		105.49125	
11:18:20	942.2		105.9975	
11:18:50	895.8		100.7775	
11:19:20	945.9		106.41375	
11:19:50	949.1		106.77375	
11:20:20	948.9		106.75125	
11:20:50	944.6		106.2675	
11:21:20	938		105.525	
11:21:50	932.1		104.86125	
11:22:20	926.7		104.25375	

11:22:50	928.9		104.50125	
11:23:20	926.1		104.18625	
11:23:50	931.5		104.79375	
11:24:20	873.8		98.3025	
11:24:50	959.5		107.94375	
11:25:20	968.9		109.00125	
11:25:50	969.2		109.035	
11:26:20	962		108.225	
11:26:50	973.6		109.53	
11:27:20	996.6		112.1175	
11:27:50	423		47.5875	
11:28:20	407.6		45.855	
11:28:50	1075		120.9375	
11:29:20	314.3		35.35875	
11:29:50	255.7		28.76625	
11:30:20	1023		115.0875	
11:30:50	1072		120.6	
11:31:20	1041		117.1125	
11:31:50	1037		116.6625	
11:32:20	1031		115.9875	
11:32:50	910.3		102.40875	
11:33:20	357.1		40.17375	
11:33:50	579.9		65.23875	
11:34:20	274.9		30.92625	
11:34:50	243		27.3375	
11:35:20	276.5		31.10625	
11:35:50	251.8		28.3275	
11:36:20	575.1		64.69875	
11:36:50	1008		113.4	
11:37:20	997.4		112.2075	
11:37:50	986.9		111.02625	
11:38:20	984.1		110.71125	
11:38:50	988.7		111.22875	
11:39:20	585		65.8125	
11:39:50	180.8		20.34	
11:40:20	163.5		18.39375	
11:40:50	160.4		18.045	
11:41:20	161.5		18.16875	
11:41:50	211.5		23.79375	
11:42:20	678.9		76.37625	
11:42:50	995.6		112.005	
11:43:20	995.5		111.99375	



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11:43:50	200.8		22.59	
11:44:20	192.8		21.69	
11:44:50	188.6		21.2175	
11:45:20	191.6		21.555	
11:45:50	338.4		38.07	
11:46:20	178.3		20.05875	
11:46:50	961.7		108.19125	
11:47:20	952.9		107.20125	
11:47:50	968.1		108.91125	
11:48:20	973.8		109.5525	
11:48:50	986.9		111.02625	
11:49:20	1005		113.0625	
11:49:50	1042		117.225	
11:50:20	1029		115.7625	
11:50:50	263.5		29.64375	
11:51:20	282.5		31.78125	
11:51:50	194.4		21.87	
11:52:20	209.5		23.56875	
11:52:50	473.2		53.235	
11:53:20	785.3		88.34625	
11:53:50	230.8		25.965	
11:54:20	292.6		32.9175	
11:54:50	1073		120.7125	
11:55:20	224.2		25.2225	
11:55:50	198.4		22.32	
11:56:20	204.7		23.02875	
11:56:50	1003		112.8375	
11:57:20	983.9		110.68875	
11:57:50	985.6		110.88	
11:58:20	975.3		109.72125	
11:58:50	957.8		107.7525	
11:59:20	970.6		109.1925	
11:59:50	994.7		111.90375	
12:00:20	1008		113.4	
12:00:50	289.1		32.52375	
12:01:20	710.6		79.9425	
12:01:50	951.1		106.99875	
12:02:20	291.2		32.76	
12:02:50	1027		115.5375	
12:03:20	1044		117.45	
12:03:50	508		57.15	
12:04:20	1022		114.975	

12:04:50	594.9		66.92625	
12:05:20	1028		115.65	
12:05:50	1025		115.3125	
12:06:20	222.6		25.0425	
12:06:50	186.5		20.98125	
12:07:20	162.8		18.315	
12:07:50	141.7		15.94125	
12:08:20	129.2		14.535	
12:08:50	122.7		13.80375	
12:09:20	125.2		14.085	
12:09:50	132		14.85	
12:10:20	141.2		15.885	
12:10:50	168.1		18.91125	
12:11:20	972.7		109.42875	
12:11:50	977.9		110.01375	
12:12:20	957.9		107.76375	
12:12:50	952.9		107.20125	
12:13:20	950.6		106.9425	
12:13:50	945.9		106.41375	
12:14:20	942.1		105.98625	
12:14:50	955.9		107.53875	
12:15:20	199.2		22.41	
12:15:50	146.6		16.4925	
12:16:20	179.7		20.21625	
12:16:50	221.5		24.91875	
12:17:20	963.9		108.43875	
12:17:50	958.4		107.82	
12:18:20	952.4		107.145	
12:18:50	960.3		108.03375	
12:19:20	967.3		108.82125	
12:19:50	549.6		61.83	
12:20:20	156.3		17.58375	
12:20:50	162.4		18.27	
12:21:20	176.4		19.845	
12:21:50	216.9		24.40125	
12:22:20	239.1		26.89875	
12:22:50	317.6		35.73	
12:23:20	1019		114.6375	
12:23:50	985.6		110.88	
12:24:20	991.7		111.56625	
12:24:50	983.1		110.59875	
12:25:20	974.6		109.6425	



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12:25:50	971.2		109.26	
12:26:20	972.2		109.3725	
12:26:50	975.3		109.72125	
12:27:20	973.4		109.5075	
12:27:50	975.8		109.7775	
12:28:20	980.1		110.26125	
12:28:50	985		110.8125	
12:29:20	987.1		111.04875	
12:29:50	995.3		111.97125	
12:30:20	999.3		112.42125	
12:30:50	982.8		110.565	
12:31:20	1000		112.5	
12:31:50	1007		113.2875	
12:32:20	1008		113.4	
12:32:50	1000		112.5	
12:33:20	999.1		112.39875	
12:33:50	916.4		103.095	
12:34:20	980.9		110.35125	
12:34:50	976.3		109.83375	
12:35:20	964.7		108.52875	
12:35:50	956		107.55	
12:36:20	954.9		107.42625	
12:36:50	953.5		107.26875	
12:37:20	958.2		107.7975	
12:37:50	968.2		108.9225	
12:38:20	974.7		109.65375	
12:38:50	984.2		110.7225	
12:39:20	982.5		110.53125	
12:39:50	979.8		110.2275	
12:40:20	977.1		109.92375	
12:40:50	970.6		109.1925	
12:41:20	969.3		109.04625	
12:41:50	965.1		108.57375	
12:42:20	967.7		108.86625	
12:42:50	967.9		108.88875	
12:43:20	967.6		108.855	
12:43:50	979.9		110.23875	
12:44:20	644		72.45	
12:44:50	894.3		100.60875	
12:45:20	980.9		110.35125	
12:45:50	968.5		108.95625	
12:46:20	958.1		107.78625	

12:46:50	950.2		106.8975	
12:47:20	949.7		106.84125	
12:47:50	938		105.525	
12:48:20	917.2		103.185	
12:48:50	900.6		101.3175	
12:49:20	895.2		100.71	
12:49:50	891.1		100.24875	
12:50:20	887.5		99.84375	
12:50:50	882.9		99.32625	
12:51:20	885.1		99.57375	
12:51:50	881.8		99.2025	
12:52:20	887.1		99.79875	
12:52:50	883.5		99.39375	
12:53:20	881		99.1125	
12:53:50	869.1		97.77375	
12:54:20	868.6		97.7175	
12:54:50	870.2		97.8975	
12:55:20	887.9		99.88875	
12:55:50	900.6		101.3175	
12:56:20	904.9		101.80125	
12:56:50	903.8		101.6775	
12:57:20	906		101.925	
12:57:50	856.9		96.40125	
12:58:20	902.8		101.565	
12:58:50	901.9		101.46375	
12:59:20	900.8		101.34	
12:59:50	906.6		101.9925	
13:00:20	919.8		103.4775	
13:00:50	907.4		102.0825	
13:01:20	886.3		99.70875	
13:01:50	884.6		99.5175	
13:02:20	879.1		98.89875	
13:02:50	868.9		97.75125	
13:03:20	863.5		97.14375	
13:03:50	347.3		39.07125	
13:04:20	561.7		63.19125	
13:04:50	885.9		99.66375	
13:05:20	880.6		99.0675	
13:05:50	876.7		98.62875	
13:06:20	880.6		99.0675	
13:06:50	881.8		99.2025	
13:07:20	875.4		98.4825	



Renewable Energy Resource Assessment in Kabupaten Kepulauan Selayar, 2019

13:07:50	868.3		97.68375	
13:08:20	870.7		97.95375	
13:08:50	868.4		97.695	
13:09:20	871.8		98.0775	
13:09:50	883.7		99.41625	
13:10:20	893.9		100.56375	
13:10:50	901.4		101.4075	
13:11:20	905.3		101.84625	
13:11:50	930.8		104.715	
13:12:20	852.9		95.95125	
13:12:50	368.3		41.43375	
13:13:20	325.7		36.64125	
13:13:50	889		100.0125	
13:14:20	874.9		98.42625	
13:14:50	884.1		99.46125	
13:15:20	872.9		98.20125	
13:15:50	873.4		98.2575	
13:16:20	871		97.9875	
13:16:50	864.8		97.29	
13:17:20	859.4		96.6825	
13:17:50	839.8		94.4775	
13:18:20	844.4		94.995	
13:18:50	806.5		90.73125	
13:19:20	842.6		94.7925	
13:19:50	819		92.1375	
13:20:20	866.1		97.43625	
13:20:50	841.4		94.6575	
13:21:20	776.9		87.40125	
13:21:50	869.2		97.785	
13:22:20	852.9		95.95125	
13:22:50	839.1		94.39875	
13:23:20	829.5		93.31875	
13:23:50	833.1		93.72375	
13:24:20	830.8		93.465	
13:24:50	829		93.2625	
13:25:20	826.6		92.9925	
13:25:50	824.7		92.77875	
13:26:20	817.9		92.01375	
13:26:50	515		57.9375	
13:27:20	815.7		91.76625	
13:27:50	811.9		91.33875	
13:28:20	814.6		91.6425	



13:28:50	812.7		91.42875	
13:29:20	811.4		91.2825	
13:29:50	662.6		74.5425	
13:30:20	317.3		35.69625	
13:30:50	792.6		89.1675	
13:31:20	818.6		92.0925	
13:31:50	658.9		74.12625	
13:32:20	135.2		15.21	
13:32:50	116.7		13.12875	
13:33:20	119.4		13.4325	
13:33:50	707.5		79.59375	
13:34:20	801.8		90.2025	
13:34:50	791.5		89.04375	
13:35:20	782.5		88.03125	
13:35:50	783.6		88.155	
13:36:20	740.2		83.2725	
13:36:50	781.2		87.885	
13:37:20	785.9		88.41375	
13:37:50	766.8		86.265	
13:38:20	782		87.975	
13:38:50	776.9		87.40125	
13:39:20	768.4		86.445	
13:39:50	769.3		86.54625	
13:40:20	766		86.175	
13:40:50	769		86.5125	
13:41:20	771.5		86.79375	
13:41:50	781		87.8625	
13:42:20	773		86.9625	
13:42:50	759.2		85.41	
13:43:20	752.5		84.65625	
13:43:50	748.6		84.2175	
13:44:20	754.9		84.92625	
13:44:50	715.8		80.5275	
13:45:20	683		76.8375	
13:45:50	758.2		85.2975	
13:46:20	748.4		84.195	
13:46:50	747.3		84.07125	
13:47:20	750.5		84.43125	
13:47:50	755.1		84.94875	
13:48:20	761.2		85.635	
13:48:50	756		85.05	
13:49:20	756.8		85.14	



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13:49:50	757.4		85.2075	
13:50:20	764.1		85.96125	
13:50:50	779.9		87.73875	
13:51:20	629.6		70.83	
13:51:50	159.6		17.955	
13:52:20	174		19.575	
13:52:50	311.1		34.99875	
13:53:20	830		93.375	
13:53:50	237.8		26.7525	
13:54:20	182.4		20.52	
13:54:50	138.7		15.60375	
13:55:20	127.4		14.3325	
13:55:50	182.4		20.52	
13:56:20	448.8		50.49	
13:56:50	229.4		25.8075	
13:57:20	765.5		86.11875	
13:57:50	737.5		82.96875	
13:58:20	729.9		82.11375	
13:58:50	723.7		81.41625	
13:59:20	718.5		80.83125	
13:59:50	717.7		80.74125	
14:00:20	718		80.775	
14:00:50	713.4		80.2575	
14:01:20	715.1		80.44875	
14:01:50	713.9		80.31375	
14:02:20	707.4		79.5825	
14:02:50	713.6		80.28	
14:03:20	722.6		81.2925	
14:03:50	731.3		82.27125	
14:04:20	744.1		83.71125	
14:04:50	747		84.0375	
14:05:20	741.1		83.37375	
14:05:50	741		83.3625	
14:06:20	744.8		83.79	
14:06:50	740.6		83.3175	
14:07:20	699.2		78.66	
14:07:50	560.6		63.0675	
14:08:20	130.3		14.65875	
14:08:50	134.7		15.15375	
14:09:20	275.4		30.9825	
14:09:50	726.7		81.75375	
14:10:20	712.5		80.15625	

14:10:50	714.2		80.3475	
14:11:20	708.3		79.68375	
14:11:50	708.5		79.70625	
14:12:20	683.9		76.93875	
14:12:50	693.9		78.06375	
14:13:20	688.9		77.50125	
14:13:50	685.8		77.1525	
14:14:20	672.2		75.6225	
14:14:50	666.5		74.98125	
14:15:20	664.5		74.75625	
14:15:50	665.9		74.91375	
14:16:20	659.7		74.21625	
14:16:50	680		76.5	
14:17:20	697.7		78.49125	
14:17:50	710.1		79.88625	
14:18:20	713.7		80.29125	
14:18:50	719.6		80.955	
14:19:20	713.9		80.31375	
14:19:50	707.9		79.63875	
14:20:20	685.5		77.11875	
14:20:50	706		79.425	
14:21:20	693.3		77.99625	
14:21:50	704.7		79.27875	
14:22:20	157		17.6625	
14:22:50	713.4		80.2575	
14:23:20	707.1		79.54875	
14:23:50	702.3		79.00875	
14:24:20	703.4		79.1325	
14:24:50	705.3		79.34625	
14:25:20	699.8		78.7275	
14:25:50	697.9		78.51375	
14:26:20	472.5		53.15625	
14:26:50	682.4		76.77	
14:27:20	436.3		49.08375	
14:27:50	707.1		79.54875	
14:28:20	438.8		49.365	
14:28:50	485.4		54.6075	
14:29:20	166.2		18.6975	
14:29:50	173.2		19.485	
14:30:20	208		23.4	
14:30:50	140.3		15.78375	
14:31:20	529.1		59.52375	



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14:31:50	278.7		31.35375	
14:32:20	642.1		72.23625	
14:32:50	537.6		60.48	
14:33:20	161		18.1125	
14:33:50	598.9		67.37625	
14:34:20	598.7		67.35375	
14:34:50	622.2		69.9975	
14:35:20	614.6		69.1425	
14:35:50	609.4		68.5575	
14:36:20	602.5		67.78125	
14:36:50	595.9		67.03875	
14:37:20	590.2		66.3975	
14:37:50	588		66.15	
14:38:20	585.6		65.88	
14:38:50	587.8		66.1275	
14:39:20	581		65.3625	
14:39:50	573.6		64.53	
14:40:20	534.6		60.1425	
14:40:50	569.9		64.11375	
14:41:20	570.1		64.13625	
14:41:50	567.9		63.88875	
14:42:20	564.2		63.4725	
14:42:50	564.9		63.55125	
14:43:20	566.1		63.68625	
14:43:50	562.2		63.2475	
14:44:20	562.5		63.28125	
14:44:50	557.9		62.76375	
14:45:20	551.1		61.99875	
14:45:50	550.8		61.965	
14:46:20	550.9		61.97625	
14:46:50	543.2		61.11	
14:47:20	548.7		61.72875	
14:47:50	548.1		61.66125	
14:48:20	542.5		61.03125	
14:48:50	535.2		60.21	
14:49:20	538.2		60.5475	
14:49:50	541.3		60.89625	
14:50:20	524.6		59.0175	
14:50:50	447.7		50.36625	
14:51:20	489.6		55.08	
14:51:50	493.6		55.53	
14:52:20	360.6		40.5675	

14:52:50	389.1		43.77375	
14:53:20	505		56.8125	
14:53:50	325.6		36.63	
14:54:20	368.8		41.49	
14:54:50	359.8		40.4775	
14:55:20	286.1		32.18625	
14:55:50	295.6		33.255	
14:56:20	264.7		29.77875	
14:56:50	278.2		31.2975	
14:57:20	171.8		19.3275	
14:57:50	128.4		14.445	
14:58:20	67.7		7.61625	
14:58:50	65.5		7.36875	
14:59:20	71.1		7.99875	
14:59:50	76.4		8.595	
15:00:20	82		9.225	
15:00:50	146.4		16.47	
Average	<b>692.1336207</b>		<b>77.86503233</b>	



**Appendix Table 9, Daily solar irradiance 28 June 2019**

Site Name:	Syafira hotel Rooftop	Date:	28/06/2019	Equipment:
Location:				
	Lat:	Long:		
Elevation:	+ 1 meter	Time Zone:	WITA	
Time	Solar irradiance (W/m2)	Air Temperature (degree C)	PV Power output (W/m2)	Remark
09:00:29	152.1		17.11125	
09:00:59	155		17.4375	
09:01:29	355.8		40.0275	
09:01:59	145.8		16.4025	
09:02:29	164.8		18.54	
09:02:59	363.6		40.905	
09:03:29	518.9		58.37625	
09:03:59	353.4		39.7575	
09:04:29	426.6		47.9925	
09:04:59	622.7		70.05375	
09:05:29	626		70.425	
09:05:59	629.9		70.86375	
09:06:29	632.8		71.19	
09:06:59	635.8		71.5275	
09:07:29	642.8		72.315	
09:07:59	639.8		71.9775	
09:08:29	654.2		73.5975	
09:08:59	654.3		73.60875	
09:09:29	659.4		74.1825	
09:09:59	652.6		73.4175	
09:10:29	636.6		71.6175	
09:10:59	650.4		73.17	
09:11:29	633.4		71.2575	
09:11:59	619.6		69.705	
09:12:29	488.4		54.945	
09:12:59	451.1		50.74875	
09:13:29	180.2		20.2725	
09:13:59	408.1		45.91125	
09:14:29	442.9		49.82625	
09:14:59	420.3		47.28375	
09:15:29	421.8		47.4525	
09:15:59	359.3		40.42125	
09:16:29	419		47.1375	

09:16:59	450.4		50.67	
09:17:29	506.3		56.95875	
09:17:59	524.5		59.00625	
09:18:29	528		59.4	
09:18:59	463		52.0875	
09:19:29	176.1		19.81125	
09:19:59	375		42.1875	
09:20:29	182.2		20.4975	
09:20:59	175.1		19.69875	
09:21:29	432.5		48.65625	
09:21:59	494.2		55.5975	
09:22:29	543.5		61.14375	
09:22:59	625.2		70.335	
09:23:29	421.1		47.37375	
09:23:59	672.9		75.70125	
09:24:29	652.1		73.36125	
09:24:59	660.5		74.30625	
09:25:29	626.3		70.45875	
09:25:59	649.1		73.02375	
09:26:29	688.2		77.4225	
09:26:59	627.6		70.605	
09:27:29	252.4		28.395	
09:27:59	384.6		43.2675	
09:28:29	412.8		46.44	
09:28:59	216.9		24.40125	
09:29:29	194.9		21.92625	
09:29:59	186.7		21.00375	
09:30:29	184.1		20.71125	
09:30:59	181.6		20.43	
09:31:29	184		20.7	
09:31:59	205.2		23.085	
09:32:29	759		85.3875	
09:32:59	763.3		85.87125	
09:33:29	507.5		57.09375	
09:33:59	240		27	
09:34:29	257.9		29.01375	
09:34:59	247.3		27.82125	
09:35:29	220.4		24.795	
09:35:59	213.9		24.06375	
09:36:29	269.3		30.29625	
09:36:59	225.8		25.4025	
09:37:29	580.2		65.2725	



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09:37:59	365.5		41.11875	
09:38:29	685.2		77.085	
09:38:59	690.6		77.6925	
09:39:29	673.8		75.8025	
09:39:59	734.5		82.63125	
09:40:29	787.8		88.6275	
09:40:59	397.3		44.69625	
09:41:29	839.1		94.39875	
09:41:59	340.9		38.35125	
09:42:29	824.3		92.73375	
09:42:59	857.2		96.435	
09:43:29	432.9		48.70125	
09:43:59	853.2		95.985	
09:44:29	860.2		96.7725	
09:44:59	865.9		97.41375	
09:45:29	799.2		89.91	
09:45:59	752.5		84.65625	
09:46:29	832.8		93.69	
09:46:59	811.8		91.3275	
09:47:29	721.2		81.135	
09:47:59	732.9		82.45125	
09:48:29	543.8		61.1775	
09:48:59	744.1		83.71125	
09:49:29	740.2		83.2725	
09:49:59	761.9		85.71375	
09:50:29	757.7		85.24125	
09:50:59	751.7		84.56625	
09:51:29	752.5		84.65625	
09:51:59	748.1		84.16125	
09:52:29	738.7		83.10375	
09:52:59	740		83.25	
09:53:29	742.9		83.57625	
09:53:59	752.5		84.65625	
09:54:29	755.8		85.0275	
09:54:59	616		69.3	
09:55:29	738.3		83.05875	
09:55:59	775.5		87.24375	
09:56:29	717.4		80.7075	
09:56:59	718.2		80.7975	
09:57:29	841.7		94.69125	
09:57:59	847.4		95.3325	
09:58:29	877		98.6625	



09:58:59	685.5	77.11875	
09:59:29	278.7	31.35375	
09:59:59	317.5	35.71875	
10:00:29	193.3	21.74625	
10:00:59	155.3	17.47125	
10:01:29	144.9	16.30125	
10:01:59	199.7	22.46625	
10:02:29	816.2	91.8225	
10:02:59	169.6	19.08	
10:03:29	151.8	17.0775	
10:03:59	160.5	18.05625	
10:04:29	170.7	19.20375	
10:04:59	161.6	18.18	
10:05:29	158.6	17.8425	
10:05:59	157	17.6625	
10:06:29	154.4	17.37	
10:06:59	152	17.1	
10:07:29	148.7	16.72875	
10:07:59	146.1	16.43625	
10:08:29	143.6	16.155	
10:08:59	142.5	16.03125	
10:09:29	147.4	16.5825	
10:09:59	157.7	17.74125	
10:10:29	166.4	18.72	
10:10:59	172.9	19.45125	
10:11:29	193.5	21.76875	
10:11:59	226.3	25.45875	
10:12:29	737.3	82.94625	
10:12:59	905.7	101.89125	
10:13:29	888.7	99.97875	
10:13:59	892.4	100.395	
10:14:29	884.8	99.54	
10:14:59	919.3	103.42125	
10:15:29	801	90.1125	
10:15:59	880.8	99.09	
10:16:29	878.7	98.85375	
10:16:59	809.9	91.11375	
10:17:29	837.2	94.185	
10:17:59	849.8	95.6025	
10:18:29	498.8	56.115	
10:18:59	158.8	17.865	
10:19:29	166.2	18.6975	



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10:19:59	207.6		23.355	
10:20:29	282.2		31.7475	
10:20:59	579.9		65.23875	
10:21:29	953.8		107.3025	
10:21:59	628.8		70.74	
10:22:29	802.2		90.2475	
10:22:59	239.1		26.89875	
10:23:29	236.6		26.6175	
10:23:59	260.8		29.34	
10:24:29	233.4		26.2575	
10:24:59	602.9		67.82625	
10:25:29	282.6		31.7925	
10:25:59	375.1		42.19875	
10:26:29	268.2		30.1725	
10:26:59	233.4		26.2575	
10:27:29	945.3		106.34625	
10:27:59	537.6		60.48	
10:28:29	307.5		34.59375	
10:28:59	901.1		101.37375	
10:29:29	958.4		107.82	
10:29:59	956.2		107.5725	
10:30:29	954.9		107.42625	
10:30:59	943		106.0875	
10:31:29	937.7		105.49125	
10:31:59	225.5		25.36875	
10:32:29	187.1		21.04875	
10:32:59	170.8		19.215	
10:33:29	183.7		20.66625	
10:33:59	168.9		19.00125	
10:34:29	167.2		18.81	
10:34:59	162.3		18.25875	
10:35:29	164		18.45	
10:35:59	170.4		19.17	
10:36:29	175.9		19.78875	
10:36:59	183.2		20.61	
10:37:29	202.5		22.78125	
10:37:59	960.9		108.10125	
10:38:29	967.9		108.88875	
10:38:59	255.1		28.69875	
10:39:29	226.1		25.43625	
10:39:59	217.7		24.49125	
10:40:29	212.3		23.88375	

10:40:59	279		31.3875	
10:41:29	224.7		25.27875	
10:41:59	183.7		20.66625	
10:42:29	213.1		23.97375	
10:42:59	905		101.8125	
10:43:29	900.8		101.34	
10:43:59	900		101.25	
10:44:29	903.3		101.62125	
10:44:59	852.1		95.86125	
10:45:29	148.3		16.68375	
10:45:59	152.1		17.11125	
10:46:29	581.5		65.41875	
10:46:59	400		45	
10:47:29	892.2		100.3725	
10:47:59	876.1		98.56125	
10:48:29	876.8		98.64	
10:48:59	866.2		97.4475	
10:49:29	864.8		97.29	
10:49:59	869.4		97.8075	
10:50:29	888.9		100.00125	
10:50:59	915.5		102.99375	
10:51:29	478.5		53.83125	
10:51:59	220.6		24.8175	
10:52:29	223.2		25.11	
10:52:59	177.2		19.935	
10:53:29	183.2		20.61	
10:53:59	198.4		22.32	
10:54:29	257.3		28.94625	
10:54:59	942.4		106.02	
10:55:29	936.1		105.31125	
10:55:59	252.5		28.40625	
10:56:29	293.7		33.04125	
10:56:59	202.3		22.75875	
10:57:29	200		22.5	
10:57:59	219.6		24.705	
10:58:29	275.7		31.01625	
10:58:59	493.9		55.56375	
10:59:29	839.5		94.44375	
10:59:59	289.9		32.61375	
11:00:29	498.5		56.08125	
11:00:59	1010		113.625	
11:01:29	401.1		45.12375	



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11:01:59	245.6		27.63	
11:02:29	231.5		26.04375	
11:02:59	241.5		27.16875	
11:03:29	278.2		31.2975	
11:03:59	730.3		82.15875	
11:04:29	240.8		27.09	
11:04:59	662.9		74.57625	
11:05:29	958.2		107.7975	
11:05:59	963.9		108.43875	
11:06:29	981.2		110.385	
11:06:59	422.6		47.5425	
11:07:29	231.8		26.0775	
11:07:59	234.5		26.38125	
11:08:29	198.5		22.33125	
11:08:59	201.2		22.635	
11:09:29	212.6		23.9175	
11:09:59	230.2		25.8975	
11:10:29	705.6		79.38	
11:10:59	313.5		35.26875	
11:11:29	254.4		28.62	
11:11:59	246.2		27.6975	
11:12:29	242.1		27.23625	
11:12:59	241.1		27.12375	
11:13:29	1004		112.95	
11:13:59	1004		112.95	
11:14:29	996.9		112.15125	
11:14:59	954.9		107.42625	
11:15:29	931.2		104.76	
11:15:59	921		103.6125	
11:16:29	915.6		103.005	
11:16:59	902.7		101.55375	
11:17:29	898.5		101.08125	
11:17:59	901.7		101.44125	
11:18:29	905.5		101.86875	
11:18:59	910.1		102.38625	
11:19:29	921.8		103.7025	
11:19:59	917.4		103.2075	
11:20:29	930.4		104.67	
11:20:59	940.2		105.7725	
11:21:29	956.3		107.58375	
11:21:59	378.8		42.615	
11:22:29	810.5		91.18125	

11:22:59	988.3		111.18375	
11:23:29	975.8		109.7775	
11:23:59	982.2		110.4975	
11:24:29	983.1		110.59875	
11:24:59	976		109.8	
11:25:29	972.7		109.42875	
11:25:59	976.6		109.8675	
11:26:29	207.6		23.355	
11:26:59	191.1		21.49875	
11:27:29	304.7		34.27875	
11:27:59	990.9		111.47625	
11:28:29	507.4		57.0825	
11:28:59	960		108	
11:29:29	934		105.075	
11:29:59	967.6		108.855	
11:30:29	711		79.9875	
11:30:59	347.9		39.13875	
11:31:29	192.7		21.67875	
11:31:59	209.3		23.54625	
11:32:29	981.7		110.44125	
11:32:59	987.2		111.06	
11:33:29	998.6		112.3425	
11:33:59	255.1		28.69875	
11:34:29	264.9		29.80125	
11:34:59	906.1		101.93625	
11:35:29	993.4		111.7575	
11:35:59	998.3		112.30875	
11:36:29	993.1		111.72375	
11:36:59	1002		112.725	
11:37:29	1011		113.7375	
11:37:59	243.5		27.39375	
11:38:29	206.6		23.2425	
11:38:59	203		22.8375	
11:39:29	210.6		23.6925	
11:39:59	215		24.1875	
11:40:29	226.9		25.52625	
11:40:59	954.8		107.415	
11:41:29	365		41.0625	
11:41:59	291.7		32.81625	
11:42:29	520.2		58.5225	
11:42:59	958.2		107.7975	
11:43:29	290.2		32.6475	



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11:43:59	953.3		107.24625	
11:44:29	791.2		89.01	
11:44:59	894.6		100.6425	
11:45:29	981.7		110.44125	
11:45:59	985.3		110.84625	
11:46:29	982		110.475	
11:46:59	979.8		110.2275	
11:47:29	985.5		110.86875	
11:47:59	986.6		110.9925	
11:48:29	988.8		111.24	
11:48:59	995.9		112.03875	
11:49:29	996.7		112.12875	
11:49:59	974.2		109.5975	
11:50:29	989.9		111.36375	
11:50:59	992		111.6	
11:51:29	978		110.025	
11:51:59	983.7		110.66625	
11:52:29	979.9		110.23875	
11:52:59	990.1		111.38625	
11:53:29	246.7		27.75375	
11:53:59	779.1		87.64875	
11:54:29	962.2		108.2475	
11:54:59	936.5		105.35625	
11:55:29	974.7		109.65375	
11:55:59	953.5		107.26875	
11:56:29	949.2		106.785	
11:56:59	949.4		106.8075	
11:57:29	952.5		107.15625	
11:57:59	960.9		108.10125	
11:58:29	963.3		108.37125	
11:58:59	965.7		108.64125	
11:59:29	968.2		108.9225	
11:59:59	970.6		109.1925	
12:00:29	982.6		110.5425	
12:00:59	233.1		26.22375	
12:01:29	183.8		20.6775	
12:01:59	195.7		22.01625	
12:02:29	252.7		28.42875	
12:02:59	419.9		47.23875	
12:03:29	958.9		107.87625	
12:03:59	972.3		109.38375	
12:04:29	922.1		103.73625	

12:04:59	970.3		109.15875	
12:05:29	889		100.0125	
12:05:59	922.1		103.73625	
12:06:29	312.3		35.13375	
12:06:59	1034		116.325	
12:07:29	930.7		104.70375	
12:07:59	981.8		110.4525	
12:08:29	382.7		43.05375	
12:08:59	156.3		17.58375	
12:09:29	144.5		16.25625	
12:09:59	141.1		15.87375	
12:10:29	139.9		15.73875	
12:10:59	144.2		16.2225	
12:11:29	164.3		18.48375	
12:11:59	239.4		26.9325	
12:12:29	778.2		87.5475	
12:12:59	973		109.4625	
12:13:29	924.4		103.995	
12:13:59	940.2		105.7725	
12:14:29	917.1		103.17375	
12:14:59	920.6		103.5675	
12:15:29	916.6		103.1175	
12:15:59	912.3		102.63375	
12:16:29	903		101.5875	
12:16:59	893.5		100.51875	
12:17:29	883.7		99.41625	
12:17:59	881.8		99.2025	
12:18:29	879.9		98.98875	
12:18:59	881.3		99.14625	
12:19:29	881.1		99.12375	
12:19:59	874.1		98.33625	
12:20:29	933.4		105.0075	
12:20:59	932.1		104.86125	
12:21:29	937		105.4125	
12:21:59	949.2		106.785	
12:22:29	948.9		106.75125	
12:22:59	953.8		107.3025	
12:23:29	963.5		108.39375	
12:23:59	964.9		108.55125	
12:24:29	961.3		108.14625	
12:24:59	979.3		110.17125	
12:25:29	980.4		110.295	



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12:25:59	980.4		110.295	
12:26:29	1000		112.5	
12:26:59	276.8		31.14	
12:27:29	203.9		22.93875	
12:27:59	199		22.3875	
12:28:29	199.8		22.4775	
12:28:59	256.8		28.89	
12:29:29	225		25.3125	
12:29:59	218		24.525	
12:30:29	223.2		25.11	
12:30:59	215.8		24.2775	
12:31:29	368.9		41.50125	
12:31:59	907.1		102.04875	
12:32:29	952.2		107.1225	
12:32:59	938.1		105.53625	
12:33:29	933.4		105.0075	
12:33:59	935		105.1875	
12:34:29	932.9		104.95125	
12:34:59	936.7		105.37875	
12:35:29	932.3		104.88375	
12:35:59	932.6		104.9175	
12:36:29	914.9		102.92625	
12:36:59	898.5		101.08125	
12:37:29	896.6		100.8675	
12:37:59	893.2		100.485	
12:38:29	879.1		98.89875	
12:38:59	872.7		98.17875	
12:39:29	870.2		97.8975	
12:39:59	872.1		98.11125	
12:40:29	871.3		98.02125	
12:40:59	879.2		98.91	
12:41:29	884		99.45	
12:41:59	895.1		100.69875	
12:42:29	906		101.925	
12:42:59	912.5		102.65625	
12:43:29	917.2		103.185	
12:43:59	922.6		103.7925	
12:44:29	928.5		104.45625	
12:44:59	933.5		105.01875	
12:45:29	933.9		105.06375	
12:45:59	931.8		104.8275	
12:46:29	925.5		104.11875	



12:46:59	931		104.7375	
12:47:29	489.2		55.035	
12:47:59	271.9		30.58875	
12:48:29	894.9		100.67625	
12:48:59	889		100.0125	
12:49:29	890		100.125	
12:49:59	888.7		99.97875	
12:50:29	888.7		99.97875	
12:50:59	889.7		100.09125	
12:51:29	889.8		100.1025	
12:51:59	892.4		100.395	
12:52:29	897.9		101.01375	
12:52:59	899.6		101.205	
12:53:29	900.3		101.28375	
12:53:59	898.1		101.03625	
12:54:29	897.6		100.98	
12:54:59	895.7		100.76625	
12:55:29	896.6		100.8675	
12:55:59	785.3		88.34625	
12:56:29	899.6		101.205	
12:56:59	900.1		101.26125	
12:57:29	896.3		100.83375	
12:57:59	897.4		100.9575	
12:58:29	899.3		101.17125	
12:58:59	898.9		101.12625	
12:59:29	900.8		101.34	
12:59:59	903.1		101.59875	
13:00:29	903.3		101.62125	
13:00:59	906.9		102.02625	
13:01:29	912.6		102.6675	
13:01:59	923.7		103.91625	
13:02:29	930.2		104.6475	
13:02:59	941.1		105.87375	
13:03:29	777.4		87.4575	
13:03:59	209.6		23.58	
13:04:29	208.7		23.47875	
13:04:59	207.7		23.36625	
13:05:29	620.4		69.795	
13:05:59	669.4		75.3075	
13:06:29	891.9		100.33875	
13:06:59	887.8		99.8775	
13:07:29	533.7		60.04125	



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13:07:59	848.7		95.47875	
13:08:29	839.1		94.39875	
13:08:59	829.8		93.3525	
13:09:29	825.5		92.86875	
13:09:59	827.9		93.13875	
13:10:29	827.9		93.13875	
13:10:59	829.2		93.285	
13:11:29	829.3		93.29625	
13:11:59	829		93.2625	
13:12:29	827.4		93.0825	
13:12:59	817.3		91.94625	
13:13:29	796.7		89.62875	
13:13:59	819.8		92.2275	
13:14:29	827.6		93.105	
13:14:59	829.2		93.285	
13:15:29	829		93.2625	
13:15:59	819		92.1375	
13:16:29	814.9		91.67625	
13:16:59	815.4		91.7325	
13:17:29	821.9		92.46375	
13:17:59	813.5		91.51875	
13:18:29	814.9		91.67625	
13:18:59	817.3		91.94625	
13:19:29	823.3		92.62125	
13:19:59	826.2		92.9475	
13:20:29	819.7		92.21625	
13:20:59	810.6		91.1925	
13:21:29	810		91.125	
13:21:59	811.6		91.305	
13:22:29	812.5		91.40625	
13:22:59	813.3		91.49625	
13:23:29	813.2		91.485	
13:23:59	815.1		91.69875	
13:24:29	810.5		91.18125	
13:24:59	804.8		90.54	
13:25:29	800.5		90.05625	
13:25:59	802.1		90.23625	
13:26:29	804.1		90.46125	
13:26:59	809.1		91.02375	
13:27:29	810.2		91.1475	
13:27:59	809.5		91.06875	
13:28:29	808.6		90.9675	

13:28:59	811.3		91.27125	
13:29:29	808.4		90.945	
13:29:59	809.1		91.02375	
13:30:29	811		91.2375	
13:30:59	808.3		90.93375	
13:31:29	808.7		90.97875	
13:31:59	806.8		90.765	
13:32:29	809.5		91.06875	
13:32:59	809.1		91.02375	
13:33:29	811.8		91.3275	
13:33:59	813.5		91.51875	
13:34:29	814		91.575	
13:34:59	810.2		91.1475	
13:35:29	806.5		90.73125	
13:35:59	805.3		90.59625	
13:36:29	807.6		90.855	
13:36:59	804.9		90.55125	
13:37:29	808.1		90.91125	
13:37:59	811.1		91.24875	
13:38:29	808.4		90.945	
13:38:59	804.8		90.54	
13:39:29	803.5		90.39375	
13:39:59	805.3		90.59625	
13:40:29	804.9		90.55125	
13:40:59	803.8		90.4275	
13:41:29	809.7		91.09125	
13:41:59	808.7		90.97875	
13:42:29	808.9		91.00125	
13:42:59	741.9		83.46375	
13:43:29	821.3		92.39625	
13:43:59	823.5		92.64375	
13:44:29	828.1		93.16125	
13:44:59	830.4		93.42	
13:45:29	831.4		93.5325	
13:45:59	830.6		93.4425	
13:46:29	825.2		92.835	
13:46:59	821.4		92.4075	
13:47:29	813		91.4625	
13:47:59	807.6		90.855	
13:48:29	797.3		89.69625	
13:48:59	793.7		89.29125	
13:49:29	783.7		88.16625	



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13:49:59	785.1		88.32375	
13:50:29	779.3		87.67125	
13:50:59	776.4		87.345	
13:51:29	769.5		86.56875	
13:51:59	763.8		85.9275	
13:52:29	756.3		85.08375	
13:52:59	751.1		84.49875	
13:53:29	728		81.9	
13:53:59	747.9		84.13875	
13:54:29	749.7		84.34125	
13:54:59	755.4		84.9825	
13:55:29	753.8		84.8025	
13:55:59	754.7		84.90375	
13:56:29	756		85.05	
13:56:59	759.2		85.41	
13:57:29	764.4		85.995	
13:57:59	768.2		86.4225	
13:58:29	766.3		86.20875	
13:58:59	767.4		86.3325	
13:59:29	761.1		85.62375	
13:59:59	697.4		78.4575	
14:00:29	206.3		23.20875	
14:00:59	750.6		84.4425	
14:01:29	746.3		83.95875	
14:01:59	741.9		83.46375	
14:02:29	735.3		82.72125	
14:02:59	731		82.2375	
14:03:29	738.3		83.05875	
14:03:59	680.1		76.51125	
14:04:29	747.1		84.04875	
14:04:59	748.1		84.16125	
14:05:29	741.6		83.43	
14:05:59	734.9		82.67625	
14:06:29	729.2		82.035	
14:06:59	724.6		81.5175	
14:07:29	724.8		81.54	
14:07:59	732.4		82.395	
14:08:29	651.6		73.305	
14:08:59	741.3		83.39625	
14:09:29	762.7		85.80375	
14:09:59	709.4		79.8075	
14:10:29	771.7		86.81625	

14:10:59	682	76.725	
14:11:29	197.9	22.26375	
14:11:59	124	13.95	
14:12:29	366.7	41.25375	
14:12:59	295.9	33.28875	
14:13:29	712.6	80.1675	
14:13:59	699.5	78.69375	
14:14:29	691.4	77.7825	
14:14:59	689.5	77.56875	
14:15:29	674.9	75.92625	
14:15:59	678.6	76.3425	
14:16:29	681.1	76.62375	
14:16:59	678.6	76.3425	
14:17:29	677.3	76.19625	
14:17:59	677.1	76.17375	
14:18:29	674.4	75.87	
14:18:59	672.4	75.645	
14:19:29	673.7	75.79125	
14:19:59	677.3	76.19625	
14:20:29	673.7	75.79125	
14:20:59	666.2	74.9475	
14:21:29	667.8	75.1275	
14:21:59	667.5	75.09375	
14:22:29	667.5	75.09375	
14:22:59	667	75.0375	
14:23:29	665.1	74.82375	
14:23:59	664.2	74.7225	
14:24:29	660.8	74.34	
14:24:59	659.7	74.21625	
14:25:29	658	74.025	
14:25:59	655.4	73.7325	
14:26:29	661.9	74.46375	
14:26:59	471.6	53.055	
14:27:29	118.1	13.28625	
14:27:59	683.2	76.86	
14:28:29	676.5	76.10625	
14:28:59	663.5	74.64375	
14:29:29	659.1	74.14875	
14:29:59	661.9	74.46375	
14:30:29	656.5	73.85625	
14:30:59	227.8	25.6275	
14:31:29	665.9	74.91375	



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14:31:59	646.6		72.7425	
14:32:29	640.9		72.10125	
14:32:59	637.7		71.74125	
14:33:29	638.2		71.7975	
14:33:59	635		71.4375	
14:34:29	633.3		71.24625	
14:34:59	637.2		71.685	
14:35:29	635.2		71.46	
14:35:59	573.9		64.56375	
14:36:29	634.9		71.42625	
14:36:59	625.8		70.4025	
14:37:29	620.6		69.8175	
14:37:59	614.1		69.08625	
14:38:29	614.4		69.12	
14:38:59	612.2		68.8725	
14:39:29	615.2		69.21	
14:39:59	616.6		69.3675	
14:40:29	616		69.3	
14:40:59	610.3		68.65875	
14:41:29	602.7		67.80375	
14:41:59	609.4		68.5575	
14:42:29	606.8		68.265	
14:42:59	604.6		68.0175	
14:43:29	602.5		67.78125	
14:43:59	600		67.5	
14:44:29	596.5		67.10625	
14:44:59	595.4		66.9825	
14:45:29	587.5		66.09375	
14:45:59	592.4		66.645	
14:46:29	591.6		66.555	
14:46:59	589.1		66.27375	
14:47:29	586.4		65.97	
14:47:59	585.1		65.82375	
14:48:29	585.4		65.8575	
14:48:59	583.5		65.64375	
14:49:29	584		65.7	
14:49:59	580.8		65.34	
14:50:29	577.2		64.935	
14:50:59	571.8		64.3275	
14:51:29	574		64.575	
14:51:59	572.5		64.40625	
14:52:29	573.1		64.47375	

14:52:59	572.9		64.45125	
14:53:29	571		64.2375	
14:53:59	569.9		64.11375	
14:54:29	566.8		63.765	
14:54:59	563.4		63.3825	
14:55:29	562.6		63.2925	
14:55:59	559.6		62.955	
14:56:29	557.3		62.69625	
14:56:59	554.2		62.3475	
14:57:29	553.9		62.31375	
14:57:59	552.2		62.1225	
14:58:29	551.5		62.04375	
14:58:59	550		61.875	
14:59:29	547.1		61.54875	
14:59:59	545.1		61.32375	
Average	687.3160345		<b>77.32305388</b>	



## 6.3 Wind Speed and Direction

**Appendix Table 1, Wind speed and direction 22 June 2019**

Site Name:	Tambolongan Strait	Date:	22/06/2019	Equipment:  Flow Watch CDCFL-03
Location:				
	Lat: -6.6456739	Long: 120.4305870		
Height:	± 1 meter	Time Zone:	WITA	
Time	Wind velocity (m/s)	Wind direction (to)	Power Density (kW/m <sup>2</sup> )	Remarks
08:06	5.8	Southwest	1.195061	
08:16	7.1	Southwest	2.19220488	
08:21	7.6	Southwest	2.688728	
08:26	7.1	Southwest	2.19220488	
08:36	7.7	Southwest	2.79626463	
08:46	7.7	Southwest	2.79626463	
08:56	7.6	Southwest	2.688728	
09:06	7.4	Southwest	2.481997	
09:16	7.6	Southwest	2.688728	
09:26	7.3	Southwest	2.38272913	
09:36	7.3	Southwest	2.38272913	
09:46	7.1	Southwest	2.19220488	
09:56	6.2	Southwest	1.459759	
10:06	6.7	Southwest	1.84217338	
10:16	6.5	Southwest	1.68207813	
10:26	6.3	Southwest	1.53153788	
10:36	6.8	Southwest	1.925896	
10:46	7.7	Southwest	2.79626463	
10:56	6.8	Southwest	1.925896	
11:06	6.2	Southwest	1.459759	
11:16	6.5	Southwest	1.68207813	
11:26	7.2	Southwest	2.286144	
11:36	7.4	West	2.481997	
11:46	6.8	West	1.925896	
11:56	6.6	West	1.760913	
12:06	6.7	West	1.84217338	
12:16	6.1	West	1.39025863	
12:26	6.5	West	1.68207813	
12:36	5.3	West	0.91187163	
12:46	8	Southwest	3.136	
12:56	6.3	Southwest	1.53153788	



13:06	7.5	West	2.58398438	
13:16	8.6	West	3.895843	
13:26	7.4	West	2.481997	
13:36	7.4	West	2.481997	
13:46	7.7	West	2.79626463	
13:56	6.9	Southwest	2.01211763	
14:06	7.9	Southwest	3.01986388	
Average	<b>7.03421053</b>		<b>2.18958483</b>	
Comment				Assessor: Raihan, Andi



**Appendix Table 2, Wind speed and direction 24 June 2019**

Site Name:	Padang	Date:	24/06/2019	Equipment:
Location:				Flow Watch CDCFL-03
	Lat: -6.2107990	Long: 120.4280900		
Height:	± 1 meter	Time Zone:	WITA	
Time	Wind velocity (m/s)	Wind direction (to)	Power Density (kW/m <sup>2</sup> )	Remarks
10:50	11.8	West	10.063571	
11:10	7.5	West	2.58398438	
11:30	7.3	West	2.38272913	
11:50	9.3	West	4.92668663	
12:10	8.3	West	3.50219538	
12:30	8.4	West	3.630312	
12:50	8.2	West	3.377129	
13:10	6.3	West	1.53153788	
13:30	8.7	West	4.03333088	
13:50	7.5	West	2.58398438	
14:10	6.5	West	1.68207813	
14:30	6.5	West	1.68207813	
14:50	7.6	West	2.688728	
15:10	6.4	West	1.605632	
Average	<b>7.87857143</b>		<b>3.30528406</b>	
Comment				Assessor: Raihan, Andi

**Appendix Table 3, Wind speed and direction 27 June 2019**

Site Name:	Tanadoang Summit	Date:	27/06/2019	Equipment:  Flow Watch CDCFL-03
Location:				
	Lat: -6.2107990	Long: 120.4280900		
Height:	+ 3 meters	Time Zone:	WITA	
Time	Wind velocity (m/s)	Wind direction (to)	Power Density (kW/m <sup>2</sup> )	Remarks
08:35	4.5	West	0.55814063	
08:45	4.5	West	0.55814063	
08:55	5	West	0.765625	
09:05	3.1	West	0.18246988	
09:15	5.1	West	0.81248738	
09:25	3.7	West	0.31024963	
09:35	4.9	West	0.72060013	
09:45	3.2	West	0.200704	
09:55	4.9	West	0.72060013	
10:05	5.6	West	1.075648	
10:15	4.9	West	0.72060013	
10:25	3.6	West	0.285768	
10:35	3	West	0.165375	
10:45	3.5	West	0.26260938	
10:55	3.1	West	0.18246988	
11:05	2.5	West	0.09570313	
11:15	2.5	West	0.09570313	
11:25	1.1	West	0.00815238	
11:35	2.2	West	0.065219	
11:45	3.5	West	0.26260938	
11:55	1.5	West	0.02067188	
12:05	2	West	0.049	
12:15	3.4	West	0.240737	
12:25	1.5	West	0.02067188	
12:35	1.4	West	0.016807	
12:45	2	West	0.049	
12:55	1.9	West	0.04201138	
13:05	1.3	West	0.01345663	
13:15	1.5	West	0.02067188	
13:25	1.3	West	0.01345663	
13:35	2.1	West	0.05672363	
Average	<b>3.04193548</b>		<b>0.27716396</b>	



**Appendix Table 4, Wind speed and direction 28 June 2019**

Site Name:	Tanadoang Summit	Date:	28/06/2019	Equipment: Flow Watch CDCFL-03
Location:				
	Lat: -6.2107990	Long: 120.4280900		
Height:	+ 3 meters	Time Zone:	WITA	
Time	Wind velocity (m/s)	Wind direction (to)	Power Density (kW/m <sup>2</sup> )	Remarks
08:35	2.6	West	0.107653	
08:45	2.9	West	0.149382625	
08:55	2.5	West	0.095703125	
09:05	2.8	West	0.134456	
09:15	2.9	West	0.149382625	
09:25	3	West	0.165375	
09:35	2.6	West	0.107653	
09:45	2	West	0.049	
09:55	2.4	West	0.084672	
10:05	2.3	West	0.074522875	
10:15	2.6	West	0.107653	
10:25	2.9	West	0.149382625	
10:35	3	West	0.165375	
10:45	2.4	West	0.084672	
10:55	2.5	West	0.095703125	
11:05	2.3	West	0.074522875	
11:15	2.5	West	0.095703125	
11:25	1.8	West	0.035721	
11:35	2.3	West	0.074522875	
11:45	2.6	West	0.107653	
Average	<b>2.545</b>		<b>0.105435444</b>	
Comment				Assessor: Achsani, Raihan

**Appendix Table 5, Wind speed and direction 29 June 2019**

Site Name:	Bontomatene	Date:	29/06/2019	Equipment:  Flow Watch CDCFL-03
Location:				
	Lat: -5.827769	Long: 120.490120		
Height:	± 6 meters	Time Zone:	WITA	
Time	Wind velocity (m/s)	Wind direction (to)	Power Density (kW/m <sup>2</sup> )	
09:24	3	Southwest	0.165375	
09:29	4	Southwest	0.392	
09:34	3	Southwest	0.165375	
09:39	3.5	Southwest	0.26260938	
09:44	2	Southwest	0.049	
09:49	3.5	Southwest	0.26260938	
09:54	4	Southwest	0.392	
09:59	3	Southwest	0.165375	
10:04	4	Southwest	0.392	
10:09	3	Southwest	0.165375	
10:14	4	Southwest	0.392	
10:19	3	Southwest	0.165375	
10:24	3.5	Southwest	0.26260938	
Average	<b>3.34615385</b>		<b>0.24859255</b>	
Comment				Assessor: Achsani, Raihan



## 6.4 Tidal current

Appendix Table 1, Tidal current 22 June 2019

Site Name:	Tambolongan Strait	Date:	22/06/2019	Equipment: Flow Watch CDCFL-03
Location:				
	Lat: -6.6456739	Long: 120.4305870		
Water Depth:	± 1 meter	Time Zone:	WITA	
Time	Current velocity (m/s)	Current direction (from)	Power Density (kW/m <sup>2</sup> )	
08:05	0.6	East	1.08	
08:15	0.6	East	1.08	
08:20	0.6	East	1.08	
08:25	0.6	East	1.08	
08:35	0.7	East	1.715	
08:45	0.7	East	1.715	
08:55	0.6	East	1.08	
09:05	0.6	East	1.08	
09:15	0.6	East	1.08	
09:25	0.5	East	0.625	
09:35	0.5	East	0.625	
09:45	0.4	East	0.32	
09:55	0.3	East	0.135	
10:05	0.3	East	0.135	
10:15	0.3	East	0.135	
10:25	0.2	East	0.04	
10:35	0.1	East	0.005	
10:45	0.1	East	0.005	
10:55	0	East	0	
11:05	0	East	0	
11:15	0.1	West	0.005	
11:25	0.2	West	0.04	
11:35	0.3	West	0.135	
11:45	0.6	West	1.08	
11:55	0.6	West	1.08	
12:05	0.7	West	1.715	
12:15	0.6	West	1.08	
12:25	0.6	West	1.08	
12:35	0.6	West	1.08	
12:45	0.6	West	1.08	

12:55	0.6	West	<b>1.08</b>	
13:05	0.5	West	<b>0.625</b>	
13:15	0.4	West	<b>0.32</b>	
13:25	0.4	West	<b>0.32</b>	
13:35	0.3	West	<b>0.135</b>	
13:45	0.2	West	<b>0.04</b>	
13:55	0.2	West	<b>0.04</b>	
14:05	0.1	West	<b>0.005</b>	
Average	0.418421053		0.630394737	
Comment				Assessor: Raihan, Andi



**Appendix Table 2, Tidal current 24 June 2019**

Site Name:	Padang	Date:	24/06/2019	Equipment:  Flow Watch CDCFL-03
Location:				
	Lat: -6.2107990	Long: 120.4280900		
Water Depth:	+ 1 meter	Time Zone:	WITA	
Time	Current velocity (m/s)	Current direction (from)	Power Density (kW/m <sup>2</sup> )	
10:51	0.1	East	<b>0.005</b>	
11:11	0.1	East	<b>0.005</b>	
11:31	0.2	East	<b>0.04</b>	
11:51	0.1	East	<b>0.005</b>	
12:11	0.2	East	<b>0.04</b>	
12:31	0.2	East	<b>0.04</b>	
12:51	0.3	East	<b>0.135</b>	
13:11	0.1	East	<b>0.005</b>	
13:31	0.3	East	<b>0.135</b>	
13:51	0	East	<b>0</b>	
14:11	0	East	<b>0</b>	
14:31	0.1	West	<b>0.005</b>	
14:51	0.1	West	<b>0.005</b>	
15:11	0.1	West	<b>0.005</b>	
Average	0.14		0.03	
Comment				Assessor: Raihan, Andi