Creating an Energy & Power Demand Profile

This quick guide should help you measure the energy and power demands of your house or holiday accommodation. With this data, you can identify the type and level of technology needed these demands and give you the data required by installation companies.

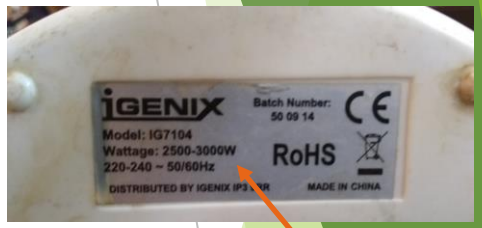
Don’t forget to watch the Introduction to Renewable Energy Webinar for more information.

Energy demand profile

Energy = watt-hours (Wh) How many watts and for how long are you using it for

1. Using the Power and energy demand profile spreadsheet on the 'Energy' tab, list all the devices in your holiday accommodation that require electricity.
2. Identify the power demand for each device in Watts (usually located on a plate on the bottom of the device)
3. Assess the amount of time per day that the device will be operating, input Watt-hours into the hour columns in the spreadsheet (Wh/day)
4. You will then have your total Wh, showing your daily energy requirement. If divided by 1000, you will have your total Kwh.

Very generally speaking, in the UK 5 sqm of solar panels will give you 1kw per hour – if operating from 9-3pm (6hrs) on a sunny day you'll receive 6kwh.



2500-3000W indicates the input power (2.5 – 3kW)

Power demand profile

Power = (w) How many watts

1. Using the Power and energy demand profile spreadsheet on the 'Power' tab, list all the devices in your holiday accommodation that require electricity. (As before on the energy sheet)
2. Identify the power demand for each device in Watts (usually located on a plate on the bottom of the device) (As before on the energy sheet)
3. Assess the time of day that the device will be operating, input the **total Watt** into the hour column where it will be in use. The power profile requires the total power demand of the device to be accounted for at the time of day that it will be used. Unlike the energy profile, the duration of its use is immaterial.
4. In the 'Total Power Drawn' (Row 36) you will see the identify the largest power consumption during one day. (when running lots at the same time)
5. This figure will allow you to identify what specification the inverter needs to be able to deliver the required total power

Batteries

- Battery storage allows you to use the energy when the source is not generating power.
- If you're off-grid, want to maximise use of energy, or have power cuts etc. Battery good is a option.
- If you're on mains electricity battery is the more expensive option.
- If you need battery storage, decide how long you will need back up for (hours or days) what is the most likely longest period might be without (wind/sun etc.)

e.g.
A 1kWh daily energy consumption, backed up for 3 days = 3000Wh
Batteries are rated in Volts and Amp hours. Volts X Ah = Wh (24V and 100Ah or 24*100 =2400Wh)
A typical lead acid leisure battery can only be discharged 50% (2400*0.5 = 1200Wh)
An inverter is required to get from 24V (dc) direct current to 230V (ac) alternating current. With a 90% efficiency.

So, number of batteries (in this example) = 3000/(0.9*1200) = 2.77 i.e 3 x 24V 100Ah

Inverters

- An inverter is required to get from 24V (dc) direct current to 230V (ac) alternating current. With a 90% efficiency.
- The inverter needs to be matched to the peak demand, but will lose efficiency at partial load, so if possible loads should be spread to reduce the peak demand.
- Most inverters can run over specification for a short period if required, but this should not be considered normal.

e.g.

Typical ancillaries (e.g. router, surveillance camera) will be small e.g. 100W, but will be on 24/7
Larger consumers (e.g. washing machine (3kW), kettle (2kW), water pumping (0.5kW) are larger but may coincide
Maximum power demand (in this example) would be 5.5kW

So, the required inverter (in this example) = 6kW (typical domestic 4-6kW)

Other Resources

- Solar Resource Maps: https://solargis.com/maps-and-gis-data/download/united-kingdom
- https://www.worcester-bosch.co.uk/products/solar/explained
- https://www.viridiansolar.co.uk/resources-1-1-UK-Eire-Solar-Resource.html
- http://news.bbc.co.uk/1/hi/in_depth/629/629/7102346.stm
- http://www.propertyinvesting.net/cgi-script/csNews/image_upload/specialreports_2edb.wind-map-england-europe-uk.jpg
- https://www.researchgate.net/figure/Annual-soil-temperature-profile-for-South-East-UK_fig1_225874880