

The Big Thing Quiz - Solutions

PV + PV inverter

- 1) Installed peak capacity: 6.4 kWp
Estimated output at 10am: 2.2 kW
Average daily production: ~25-30 kWh
- 2) It regulates the power feeding into the microgrid based on the frequency on the AC line. A lower frequency means that more power is required from the grid.

Microgrid, Batteries

- 3) Yes because Sunny Island can generate itself a grid with the use of a DC source (batteries)
- 4) Batteries are used as a mean to because as they can deliver the needed power instantaneously in DC for the Sunny Island to satisfy the need of the AC loads
- 5) No, Sunny Boy needs a grid (with a given Frequency and Voltage) in order to output energy at the frequency and voltage given by the grid generator – in this case the Sunny Island battery inverter TRUE

AC distribution

- 6) What is the difference between a breaker and a differential breaker?
- 7) What is the role of rule engine in energy management system?
- 8) What should be done before starting maintenance of AC distribution box?

Electrolyser

- 9) Each EL 2.0 yields 500 NL/hr or 0.5 Nm³/hr of hydrogen gas output at 35 bar and with a purity of 99.95% (with the dryer it is >99.999%)
- 10) None of our systems has been running longer than 10,000 hours yet so we don't really know. We provide warranties for up to 2 years. From stress testing and extrapolating data, we expect that our stacks could operate for around 30,000+ hours before degradation would start to become critical.
- 11) We need 4.8kWh to produce 1 Nm³ of hydrogen gas output at 35 bar and with a purity of 99.95% with Enapter's EL 2.0. So we need 57,6 kWh to produces one kilogram of hydrogen (compressed at 35 bar and with a purity of 99.95%).
- 12) The operative power consumption at standard conditions is 2.4 kW. The peak power consumption (max power draw at any time) is 3.0 kW and should be considered for sizing of electrical safety devices and wiring.

13) Yes

14) Up to 4 EL2.0, the flowrate of the dryer is up to 2000 NL/h

15) Answer 18

A: 1x EL2.0, daily production 5Nm³ or ~400gram of H₂

B: 2x EL2.0, daily production 5Nm³ or ~400gram of H₂

H2 Storage Tank

16) 105 kWh

Fuel Cell

17) Hydrogen, yes, for the control system (comes from 48V connection)

18) No, at atmosphere

19) No, makes no sense. Efficiency losses meaning effectively you are running a heater.

Energy Management System

20) iOS and Android

21) Gateway

22) TLS 1.2

Water System

23) 0.75-4 bar

24) The water input to the electrolyser needs to be desalinated and have a conductivity of <20 microS/cm.

25) The EL 2.0 uses 8 mm Push Fit Quick Connectors made by John Guest for the refilling inlet.

AEM Chemistry

26) All

27) All

28) All