amphibious energy

YOUR CLEAN ENERGY
OFFSHORE PARTNER

The EnergyPod

Reliable energy during the constructional phases of Offshore Wind Farms. Clean, sustainable, renewable, and at half the cost of a diesel generator.

"The zero emission option at half the cost of a diesel generator"

The EnergyPod

The offshore wind industry is an ever-growing industry across the world and will form one of the main energy sources of the future. Although the wind industry's end deliverable is clean energy, during the construction phase diesel generators are still being used to support the building and maintaining of the farms.

This first of its kind, transportable, autonomous energy container- the EnergyPod, is an all-in-one system of wind- and solar energy and battery storage. It is designed to withstand the harsh offshore North Sea environment.
With a unique combination of Amphibious Energy's patented Nautilus Offshore Wind Turbine, vertical orientated solar photovoltaic panels, and battery storage integrated with the container, it directly competes with conventional transportable power generators for the off-grid market. It fits perfectly in the ongoing energy transition and supporting the offshore wind industry to support their net-zero drive during construction and operation.

Flexible configuration

Flexibility in its design allows the EnergyPod to be assembled and single-lifted either by crane or helicopter, thus reducing installation time and supporting decluttering of work space. Each unit has a flexible configuration to fit the requirements of the operator, which minimizes the costs, risks and time for offshore deployment.

Applications

The autonomous EnergyPod provides continuous as well as peak load in any voltage for all vital systems on-board the monopiles' work platform. In addition to supporting the power requirements for the ICCP (Impressed Current Corrosion Protection) systems on the transition pieces, the EnergyPod supports the remote monitoring of essential warning systems to ensure fulfilment of the obstruction marking obligations for offshore structures.

After installation, the large turbines require auxiliary power to support its internal power consumption, for example; de-icing of blades, start-up, lights, controllers, communication, sensors, metering, and data collection. All of which the EnergyPod can support remotely.

Benefits

Cost reduction

- Cuts fuel costs
- Cuts maintenance costs due to long service intervals
- Flexible 18-60 month lease option
- More than 50% cost savings over 60 months vs. a diesel genset

Durable & Reliable

- Designed and certified for the harsh offshore environment
- Can be used on multiple sites during its lifetime
- Nautilus OWT has a 3 x longer lifespan in harsh environments than propeller turbines
- Yearly service intervals

Compact & Transportable

- All parts stored inside the container during transport
- DNV 2.7.1 Offshore container
- Small footprint of 7.5m2
- Assembly takes approx. 90 min
- Immediately produces energy after installation
- Space available inside the container for additional user equipment

Safety

- Remotely monitored and controlled from onshore
- Control panel including safe shutdown
- Additional redundancy available
- The enclosed wind turbine housing protects the safety of the crew
- Battery autonomy for 4-10 days
- Surveillance systems included

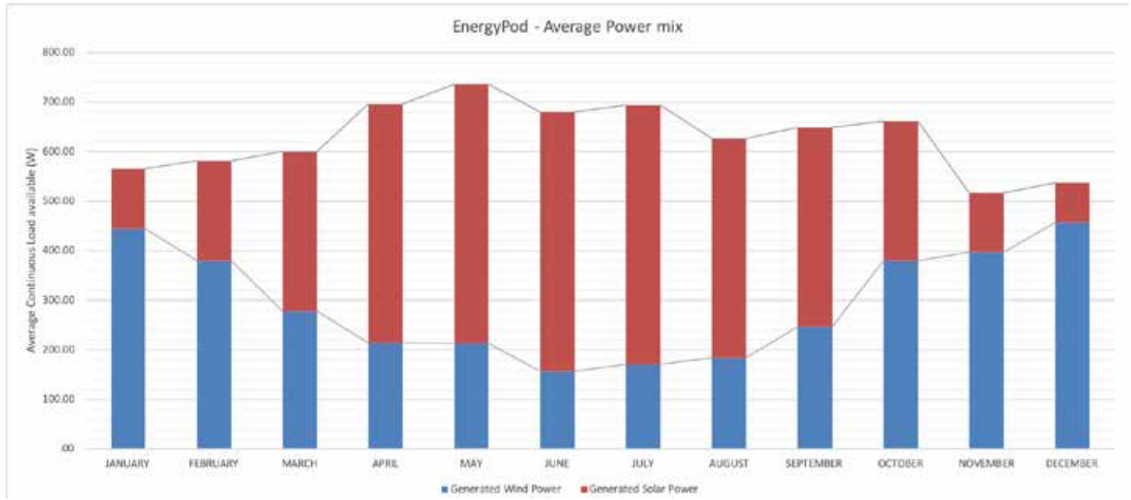
Environmentally friendly

- 100% clean, renewable energy
- Wind turbine noise reduction (<40dB)
- Supports UN Sustainable Development Goals 7 and 13
- Significant reduction of NOx and CO2 emissions
- Avoids diesel spillage during refueling
- Bird-friendly wind turbine

Performance

The unique, compact energy combination gives the EnergyPod optimal performance during all seasons of the year. With units operating and tested in Southern North Sea conditions, we can guarantee net power output for continuous as well as peak load for each unit. Sufficient power to support workings on the service platform for monopiles.

In addition to the Mono- and TwinPods, Amphibious Energy can also design and deliver larger and more advanced models if the required power or energy storage is higher. This includes an EnergyPod of up to 40 ft. called the Quadpod, which can fit up to 4 wind turbines and multiple battery packs with storage capabilities of 344 – 688kWh. The QuadPod can produce more than 4 times the energy than the standard MonoPod. Alternatively, where space and size is not an issue, we can custom design an off-grid system which can act as a mini-grid.



Net continuous load availability example for the wind and solar power mix of the EnergyPod in Southern North Sea conditions. Various configurations for alternative levels of power output are available.

Maintenance

Where a diesel genset needs servicing and refuelling every 450-500 hrs, the maintenance interval for the EnergyPod is once a year and can be paired with the operators' service interval. Alternatively, maintenance intervals can be scheduled when the user receives notification on parts requiring replacement from the autonomous remote monitoring system build into each unit.

Purchase & lease options

The EnergyPod can be purchased with a full maintenance and remote monitoring schedule, as well as leased for a flexible period of 18-60 months.

Transportable plug-and-play system

With a footprint of only 7.5m² it is the first time where a 100% renewable power generator, which includes a wind turbine, solar PV panels and batteries, is made transportable. The EnergyPod has been designed for it to be transported with all parts stored inside the 10ft or 20ft container. Assembly takes less than 90 min, after which the unit delivers power immediately. The EnergyPod can be used on multiple installations during its life time.

Components

Nautilus Wind Turbine

The patented Horizontal Helical Wind Funnel, which can be fitted with a 3kW or 5kW permanent magnetic generator, has a double layered housing. It sits in a free rotational frame, which turns itself towards the prevailing wind. The light weight rotor blades require far less rotation to generate energy than propeller blades.

Energy Management System

Using sensors, this unique system continuously measures and adapts the performance of the EnergyPod for optimal power creation and delivery. It also allows the operator to monitor and control the EnergyPod remotely via satellite or radio signal. As soon as the EMS detects anomalies, the wind turbine will come to a standstill and the problem is reported to the operator.

Brake System

The unique hydraulic brake system can hold a force of 620Nm (wind speeds exceeding >40m/s). This prevents the generator from overheating or exceeding the batteries' load capacity. Once the wind speed drops, the brake is automatically released and the wind turbine will continue to work as normal.

Solar Panel technology

The EnergyPod is designed with multiple, offshore quality PV panels, each panel delivering 375Wp. If the load is high and more power is required, then additional PV panels can be added to the EnergyPod. The panels are also calibrated to be placed vertically to minimize the footprint and reduce the need for cleaning.

Battery technology

The EnergyPod comes with two offshore certified battery packs. These batteries act as energy buffers during windless and sunless days. Battery autonomy is 4 to 10 days (for continuous load users). For the larger TwinPod, four battery packs will be included.

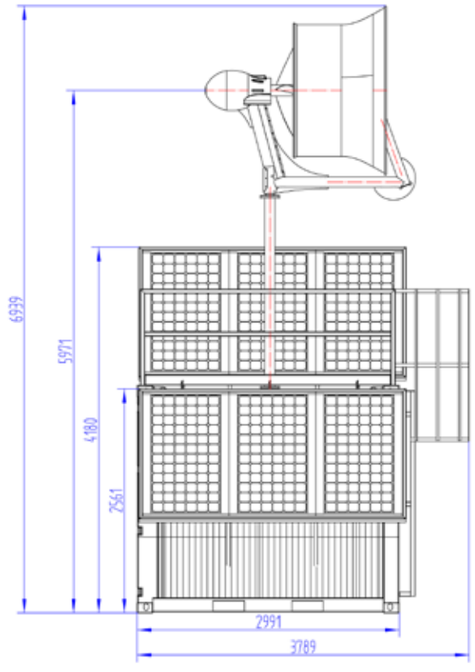
Remote surveillance system

Each EnergyPod is provided with a carefree 24/7 remote surveillance system, which is controlled by the EMS via SATCOM or 4G network connections. This system is globally accessible via a secure portal either by PC, smartphone or tablet. Monitoring includes: wind speeds, temperature, smoke detection, CCTV, system anomalies and power outage and generation.

EnergyPod options

MonoPod

- 86kWh unit
- 5-35kVa - peak load
- 8.5kW (5kW wind, 3.5kW solar) rated
- 100% renewable energy
- 1 x NOWT (5kW PMG)
- Solar PV panels (6-9 X 375Wp vertically orientated)
- Yield (Net values):
  - » 220W up to 1000W (continuous load)
  - » 2MWh up to 8.7MWh (annual delivery)
  - » 4 - 30kW output inverter (peak load)
- Battery pack:
  - » 2 x 24 2V 900Ah (86kWh), PowerSafe SBS EON
  - » Battery autonomy 4 - 10 days
- Satellite/4G controlled EMS
- Output: any voltage available on request
- Yearly maintenance interval
- 2 year guarantee
- Turnkey and full service option available
- Lease and purchase options available



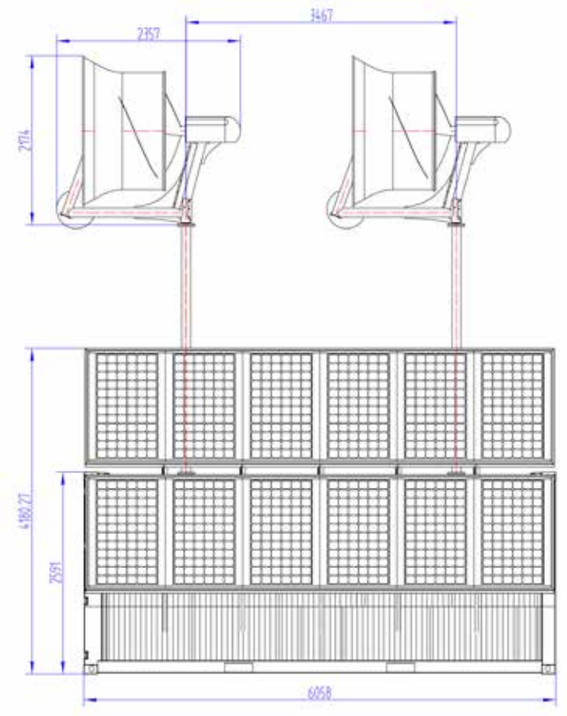
MonoPod Dimensions*:

- Footprint: 7.5m2
- Height: 6m
- Length: 3m
- Width: 2.5m
- Weight: 5500 kg

** Note: size can vary due to other configurations*

TwinPod

- 172kWh unit
- 5-100kVa – peak load
- 17kW (10kW wind, 7kW solar) rated
- 100% renewable Energy
- 2 x NOWT (2 x 5kW PMG)
- Solar PV panels (12-18 X 375Wp vertically orientated)
- Yield (Net values):
  - » 440W up to 2000W (continuous load)
  - » 4MWh up to 17.5MWh (annual delivery)
  - » 4-80kW output inverter (peak load)
- Battery pack:
  - » 4 x 24 2V 900Ah (172kWh), PowerSafe SBS EON
  - » Battery autonomy 4-10 days
- Satellite/4G controlled EMS
- Output: any voltage available on request
- Yearly maintenance interval
- 2 year guarantee
- Turnkey and full service option available
- Lease and purchase options available



TwinPod Dimensions*:

- Footprint: 15m2
- Height: 6m
- Length: 6m
- Width: 2.5m
- Weight: 9500 kg

** Note: size can vary due to other configurations*

amphibious energy

+31 (0)10 79 82 406
info@amphibiousenergy.com
www.amphibiousenergy.com

Amphibious Energy B.V.
Lichtenauerlaan 102
3062 ME Rotterdam
The Netherlands

SUSTAINABLE DEVELOPMENT GOALS

member IRO

Offshore Wind innovators

DECOM North Sea

NWEA