

# Clean Energy for EU Islands

## How engine power plants contribute to a reliable, clean, efficient and integrated energy supply

EUGINE welcomes the 'Clean Energy for EU Islands' initiative aiming at modernising the energy supply of the more than 2200 inhabited EU islands. EUGINE shares the European Commission's view that "islands have the potential to be natural winners and leaders in demonstrating new technologies and innovative solutions to achieving the clean energy transition". Engine power plants are the standard solution for supplying islands with stable electricity – specific new features and innovations are available to support islands in the modernisation of their energy system.

### 1. Engine power plants, a key role on EU islands

Engines running on diesel and Heavy-Fuel Oil (HFO) are the main source of energy supply on islands, be it in or outside of the EU. The specific and positive features of engine power plants fit very well with islands' needs:

- reliable and fast energy supply: proven and flexible technology for a continuous steady energy supply
- quick and affordable installation: robust technology for extreme conditions and easy to transport and install

- works without a supply pipeline
- modular, scalable concept: a power plant is usually composed of several engines, ready for use when installed and easily enlarged

### 2. Technology has been constantly improving

The decisions for using engine power plants on islands have been based on these capabilities, which are being constantly improved. This applies to the efficiency, and flexibility, but also includes considerable reductions in emissions.

But there are further innovations and features that add value for islands and support the modernisation:

### 3. Hybrid solutions with renewables

Many islands are trying to use available renewable energy sources, especially wind and sun. Their big disadvantage is their intermittency.

Engine power plant manufacturers have developed solutions to integrate variable renewables without compromising the security of supply: an optimised combination with engines



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- Engine power plants are playing a key role on EU islands
- Technology has been constantly improving
- Integrated concepts make energy supply cleaner and cheaper
- Total decarbonisation requires bold steps

EUGINE is the centre of knowledge for engine power plant technology and electricity market design. Its members are the leading European manufacturers of engine power plants and their key components. They provide forward-looking solutions for flexible electricity generation.

EUGINE works with EU and national institutions in order to help the European electricity system to meet the challenges of today and tomorrow.

that jump in exactly when wind and sun stop to deliver.

There are already a number of concrete examples of these hybrid plants combining the advantages of different technologies, including engine power plants with wind (e.g. Island Bonaire, NL Antilles) or with photovoltaic panels & batteries (e.g. Curaçao)

The various technologies may be connected together as part of a microgrid ensuring an efficient mix of energy supply and storage using the latest information on the availability of renewables and demand (e.g. Aruba, Faial or La Muela prototype).

#### 4. Using local waste

Engine power plants can turn waste into electricity: Via anaerobic digestion diverse types of waste (e.g. from agriculture, water treatment plants, landfills) may be transformed into renewable electricity and heat or cold by gas-fired engine power plants.

#### 5. Providing more than electricity

##### 5.1. Cogeneration

The simultaneous production of electricity and heat or cold at locations where both are

needed is an optimal way to increase energy efficiency (up to ca. 95%) and thus reduce fuel consumption, costs and emissions. Applications can be industrial needs as well as local or district heating and cooling systems. Cogeneration is supported by the energy efficiency directive.

##### 5.2. Desalination

Turning salt water into potable water is an energy intensive process. Engine power plants can do this job in a very efficient way and by this contribute to solving a challenge of many islands: a lack of potable water.

#### 6. Reducing emissions via the use of gas

Often islands lack of own gas supply. However, Liquefied Natural Gas (LNG) can be a solution to replace HFO and diesel as fuels for engine power plants, by the much cleaner gas. Multi-fuel engines are able to switch between LNG and liquid fuels and thus ensure constant security of supply even in cases of supply problems with LNG.

#### 7. Total decarbonisation requires additional steps

Power-to-Gas could become a game changer: excess electricity generated from

wind and sun may be used for electrolysis, i.e. to split water (H<sub>2</sub>O) into hydrogen (H<sub>2</sub>) and oxygen (O<sub>2</sub>) and use this renewable hydrogen. This hydrogen can be stored as it is or via 'methanation' transformed into synthetic natural gas. Both can be burned in gas engine plants without any carbon emissions. Power-to-Gas-to-Power is a very promising systemic solution for islands to integrate wind and sun and sustainably balance the energy system: while overproduction is balanced by generating green gas, supply gaps are covered by fast starting gas-engines burning the green gas when needed.

#### 8. Outlook

Engine power plants are definitely part of the solution for a cleaner energy supply on EU islands.

To reach the target that "in 2030 one thousand EU islands have managed the decarbonisation transition", appropriate framework conditions and incentives will be necessary.

EUGINE is pleased to further contribute to this process.

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