

## Case study

# Siemens Energy engine provides energy to the UK National Grid

**Customer obtains the certification for carbon emission reduction by replacing diesel fuel with natural gas in power generating plant.**

### The Opportunity

The UK faces a particular situation that forces the National Grid to make a special configuration of the electrical distribution along the country. The energy providers can't supply at 100% of availability and there may be a lack of coal-fired plants in the near future.

As such, The Capacity Market has been introduced by the UK Government as part of the Electricity Market Reform Programme to ensure the future security of our electricity supply. The Capacity Market offers all capacity providers a steady, predictable revenue stream on which they can base their future investments. In return for such revenue, providers must deliver energy at times of system stress or face penalties.

As a consequence, National Grid approached different power generation providers to meet this reserve requirement. The requirement is to focus on the total availability of the energy source at the fastest reaction, in order to provide the most efficient power output on a particular window of time.

### The Solution

National Grid selected Siemens Energy to provide a stand-by engine solution to work at certain periods of time that will allow National Grid to cover peak high demand situations most efficiently. Thirty-seven containerized Siemens SGE-56SL fast-response gas generator sets were delivered to three different sites in less than 16 weeks. Nominal output for each gen-set is 1,090 kWb (1,059 kWe) at 400 VAC.

These 40-foot (12-meter), ISO-noise-insulated containerized Siemens Energy gen-sets that include engine heat cooling equipment and power control were installed in three different areas of the UK: 19 at Exeter; six at The Drove; and 12 at Lesterway. The modular design of these three plants enables fast equipment interchangeability and is easy to construct / disassemble and move from site to site as

needed. These light-duty engines run around 2,000 operating hours/year and have a life cycle of 30 years before an overhaul. The units' configuration improves the scheduled maintenance interventions, consequently reducing operating expenditures. Further to this, this type of gas engine is 10 times less pollutant (NOx and particulates emissions) than an equivalent diesel gen-set and complies with the EU 2015/2193 Medium Combustion Plant Directive for emissions that was passed into UK Law in December 2017. This new law, published in late 2015, applies to all combustion plants rated between 1 – 50 MW thermal input.

### Benefits

Local staff received training from Siemens Energy gas engine experts to ensure proper maintenance techniques needed to maximize the engines' operating lives. In addition to the gen-sets, Siemens Energy also provided the following:

- Proven technology with high efficiency and minimum emissions level
- Low initial CAPEX and OPEX
- Ability to run full load from cold start in less than 60 seconds
- Short delivery time (16 weeks)
- High reliability and availability for heavy start/stop applications
- Easy commissioning and maintenance schedules.

Siemens Energy offers some of the most efficient and environmentally friendly technology platforms, products and services in distributed power generation for oil and gas, industrial, institutional, and commercial clients and rural electrification programs. Solutions include combined heat and power (CHP) systems, biogas-fueled gen-sets, hybrid systems (solar photovoltaic and engine-based gen-sets), biomass and waste-to-energy steam turbine generators,

compressed air energy storage (CAES), and more. With the world's largest installed base, one of the world's largest technical support and service center networks, and a presence in more than 150 countries worldwide, Siemens Energy delivers local solutions and services on a global scale

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