

LONGANNET POWER STATION: SITE INFORMATION

Key facts:

- Opened in 1972
- 2,400MW capacity
- 183m tall chimney
- Located on the north shore of the Firth of Forth
- Second largest coal-fired power plant in the UK
- Committed to reducing its environmental impact



An Introduction to Longannet Power Station

The largest generator of power in Scotland, with the capacity to power two million households, Longannet Power Station occupies an 89-hectare site on the north shore of the Firth of Forth near Kincardine, Fife.

As well as operating an Environmental Management System (EMS) that is accredited to the international standard, ISO 14001, Longannet's EMS has also been verified as meeting the requirements of the European Union Eco-Management and Audit Scheme (EMAS) and operates subject to conditions contained in Pollution Prevention and Control (PPC) Permits issued and enforced by the Scottish Environment Protection Agency (SEPA).

Longannet is committed to reducing its environmental impact – for instance, as much as possible of the ash produced from the combustion process is recycled on site for use in the construction industry; the remaining ash is piped to disposal lagoons at Low Valleyfield. These lagoons currently provide a valuable sanctuary for wildlife and will ultimately be landscaped for community use. For further information on the site's environmental performance, please refer to the annual EMAS statement.



A Part of the Community

Longannet operates at the heart of the West Fife community and strives to be a good and trusted neighbour by aiming for zero community complaints and keeping people informed about site operations. Station staff regularly attend meetings of Kincardine Community Council and Valleyfield Liaison Committee to discuss any environmental issues and are active in raising and distributing funds for good causes.

The station also operates a biodiversity action plan to manage its landholdings to benefit wildlife.

The community pathways around the lagoon

Reducing our Environmental Impact



Although the station is 40 years old, ScottishPower is investing in solutions to extend Longannet's lifespan and promote improved efficiency and reducing its environmental impact – including emissions to air, waste to landfill and use of natural resources.

In 2009, a new Boosted Over Fire Air (BOFA) abatement system was commissioned on all four units to reduce emissions of oxides of nitrogen (NOx), formed during coal combustion, by up to 25%.

In 2010, the station progressed commissioning of Flue Gas Desulphurisation (FGD) on two of its units aimed at cutting emissions of sulphur dioxide (SO₂) by up to 94%. The system uses the alkaline properties of seawater from the Forth Estuary to absorb and neutralise acidic SO₂ from the flue gases, resulting in a harmless soluble sulphate (SO₄) that can be discharged back to the Firth of Forth.

Combustion of fossil fuels, such as coal, results in the release of the greenhouse gas carbon dioxide (CO₂). To reduce its carbon impact, Longannet is improving its thermal efficiency through investing in combustion optimisation technology.

The station is also looking at installing additional NOx reduction technology, such as Selective Catalytic Reduction (SCR), that would meet future emission limits and potentially extend the station's working life by up to 30 years.

Longannet is working hard to minimise its environmental impact

LONGANNET POWER STATION: SITE INFORMATION

How it Works

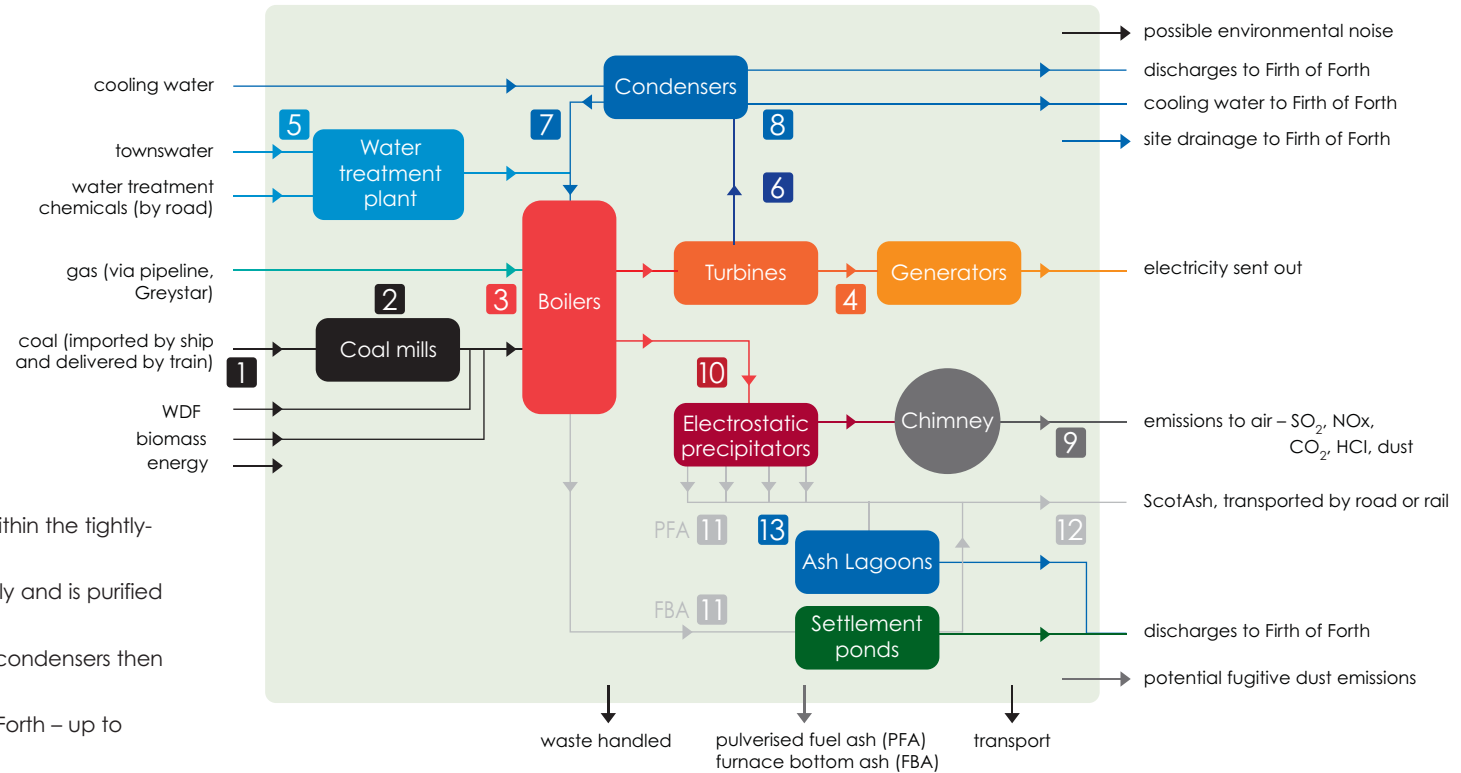
Coal for Longannet is either delivered by rail from Hunterston on the Clyde coast, or locally-sourced coal is delivered by lorry. Longannet's coal store area has the capacity to hold up to two million tonnes.

- 1 The coal is transferred to bunkers in the boiler house by a 1.5 kilometre long conveyor system.
- 2 Roller mills pulverise the coal to a fine powder before it is mixed with preheated air, blown into the furnaces and burned at very high temperatures.
- 3 Each boiler is made up of a large number of waterfilled tubes. As the hot gases from the coal combustion pass over the tubes, the water inside boils to form steam.
- 4 Up to 1,800 tonnes of steam an hour per boiler is 'super heated' to 568°C before being piped to the high pressure cylinders of the turbines. The force of the steam striking the turbine blades causes the turbine shaft and attached generator rotor to spin at 3,000 rpm. The turning of the rotor within the tightly-fixed coils of the generator stator creates electricity.
- 5 Water for steam generation comes from the townswater supply and is purified using a strictly controlled amount of chemicals.
- 6 Steam leaving the turbines is converted back to water in the condensers then recirculated back to the boilers.
- 7 The condensers use cooling water extracted from the Firth of Forth – up to 327,000 cubic metres of seawater is required per hour.
- 8 This cooling water is later discharged back to the Firth of Forth.
- 9 Generating electricity from coal produces a significant amount of ash, dust and other emissions to air.
- 10 Electrostatic precipitators capture dust particles from the flue gases to prevent them reaching the atmosphere. Our new BOFA system is reducing NOx emissions and FGD will scrub emissions of SO₂.
- 11 Two types of ash are produced. Pulverised fuel ash (PFA), which is captured in the electrostatic precipitators, and heavier furnace bottom ash (FBA), which collects at the bottom of the boiler.
- 12 A significant proportion of the ash produced at Longannet is re-used to make construction products by Longannet-based ScotAsh.
- 13 The rest of the ash is transferred to storage lagoons at Valleyfield.



The improved coal hopper

INPUTS>>



OUTPUTS>>

Environmental Performance Highlights 2010

- SEPA introduced its more rigorous Compliance Assessment Scheme (CAS). The scheme measures an operator's compliance with Pollution Prevention and Control (PPC) permits and other authorisations and licences. In 2010 the rating for Longannet Power Station was 'good' and for Valleyfield Lagoons was 'excellent', with both sites considered as having a 'high performance' of environmental management.
- There were three Incidents reportable to SEPA in 2010, one less than in 2009. Two incidents related to the unauthorised release of suspended solids from the FBA settlement Ponds into the Forth Estuary. The third was the fugitive release of smoke from a turbine lubricating oil fire.
- There were six justified community complaints in 2010, two more than received in 2009. Five were connected to nuisance noise and the sixth concerned black smoke from the station chimney. All were fully investigated and feedback given to the complainant.
- **Environmental achievements during the year included:**
 - An engineering assessment has been carried out targeting the reduction of noise emissions associated with safety valve operations and steam drainage.
 - A programme for overhauling the gearboxes of the main Cooling Water circulating pumps has been started to improve pump reliability and reduce the possibility of oil leaks.
 - Efforts continue to improve thermal efficiency by preventing air ingress to the combustion cycle.
 - Investment in new equipment for the refurbished coal exchange hopper (left) means the station can accept more locally sourced Scottish coal - reducing 'fuel transport miles'