

Key facts:

- Commissioned in 2002
- Located in Blackburn, Lancashire



An Introduction to our stations

Recognised by the Environment Agency as clean energy technology, Combined Heat and Power (CHPs) capture heat created as a byproduct of the generation process for domestic or industrial heating purposes located near to the plant.

Blackburn Mill

Commissioned in 2002, the CHP plant in Blackburn, Lancashire, was built to serve a papermill operated by Sappi. The Mill features a gas turbine and a steam turbine that work together as a Combined Cycle Gas Turbine (CCGT) plant and used to supply up to 28 tonnes per hour of process steam for the papermill while trading any additional electricity output. Since Sappi's closure in November 2008, Blackburn Mill has been operating at full load, supplying 60 MW of electricity to the National Grid.

ScottishPower operates two further facilities – an embedded 1MW generating unit that supplies Basingstoke Hospital for North Hampshire NHS Trust, and a 43MW steam raising plant for DuPont Tejan Films in Dumfries, Scotland.



Reducing our Environmental Impact

CHPs typically have a thermal efficiency rating of between 80% and 85% which means they are highly effective at turning fuel to power and hot water/steam. This efficiency results in greatly reduced to-air emissions such as carbon dioxide (CO₂) which can be less than half that of other forms of thermal generation per GWh.

Oxides of nitrogen (NO_x) and sulphur dioxide (SO₂) emissions are also significantly lower and at Blackburn Mill, Low-NO_x burners help to further reduce its formation by optimising the fuel to air mix during the combustion process.

All of ScottishPower's CHPs operate subject to conditions contained in permits issued and enforced by the Environment Agency (EA) and Scottish Environmental Protection Agency (SEPA).

Blackburn Mill also operates Environmental Management Systems (EMS) accredited to the international standard ISO 14001.

Blackburn Mill recycles waste paper, cardboard, oil and scrap metal as part of its EMS.

Helping Biodiversity

Blackburn Mill CHP launched its biodiversity action plan (BAP) in 2005, liaising with the Royal Society for the Protection of Birds (RSPB) and Lancashire Wildlife Trust (LWT) to develop a series of wildlife-friendly measures.

With the help of the scout troop from Feniscowles, staff have carried out initial work to create a wildlife corridor and provide nestboxes for birds, like the Blue Tit, and bats.

Long-term actions will include managing a copse of trees to the south of the site to improve its structure for animals and plants. Blackburn Mill is also a 'silver' corporate member of LWT.



A family of swans have made Blackburn their home

BLACKBURN MILL EMBEDDED GENERATION: SITE INFORMATION

How it Works

Blackburn Mill - a 60 MW combined cycle gas turbine plant - is the largest CHP co-generation unit operated by ScottishPower Generation.

- 1 At Blackburn Mill, natural gas is imported from the Transco National Transmission System via a purpose-built 4.6km pipeline.
- 2 The fuel is combusted in a 43MW Siemens SGT800 turbine and, as the hot gases expand through the gas turbine, they drive a generator that produces electrical power.
- 3 Waste heat from the gas turbine is used to produce steam in an Alstom ENS heat recovery boiler.
- 4 Waste gases - carbon dioxide and oxides of nitrogen - from this part of the process are released to the atmosphere through the station's 50m high chimney.
- 5 The steam produced drives a steam turbine generator to produce more electricity.
- 6 Until November 2008, steam was extracted from the steam turbine and delivered to the Sappi papermill for their paper-making process.
- 7 The demineralised water for the steam cycle is produced in a Vattentechnik ion exchange water treatment plant and stored in a 400m² tank. Strictly-controlled amounts of chemicals are used to control pH levels and prevent scaling.
- 8 Surplus steam is condensed in a watercooled condenser and the heat is dissipated in the Balcke Duerr hybrid cooling towers. The cooling water required is extracted from a reservoir at the former Sappi papermill and pumped to the CHP plant for storage in a 900m² tank.

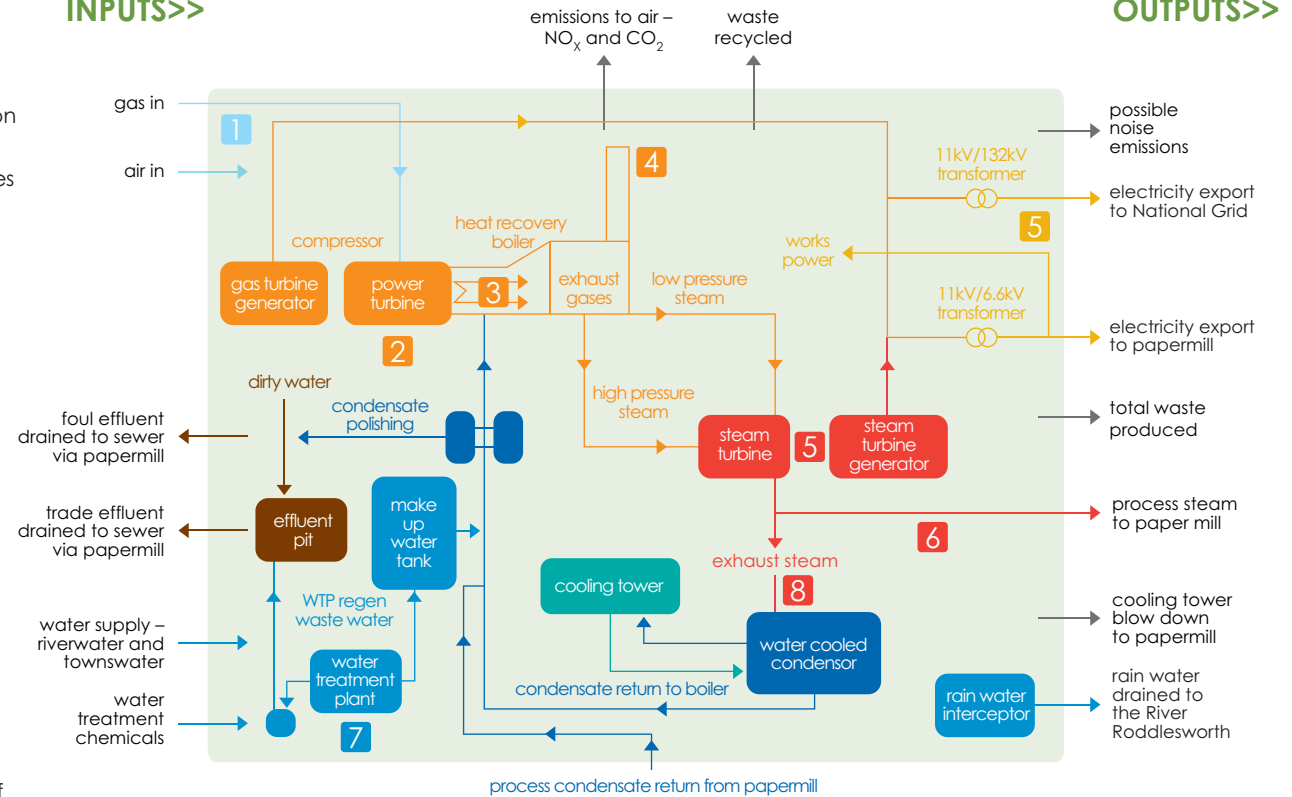
Sappi's peak demand used to be about 10MW - however, since the closure of the papermill, Blackburn Mill's full output of around 60MW is traded by Generation. The electricity generated is exported via an 11/132kV transformer into the local 132kV electricity distribution network.

Environmental Performance Highlights

Since the closure of the Sappi papermill in 2008, Blackburn has operated as a small CCGT station.

Blackburn Power Station is a highly flexible generator. It is capable of carrying out two-shifts - shutting down when electricity prices are low and starting up again to take advantage of higher peak prices. The plant can also operate at baseload (or continuously) and at minimal load, according to prevailing market conditions.

INPUTS>>



OUTPUTS>>

Recent Environmental reduction projects included installation of Solar Lighting Tubes within the Water Treatment Plant and renewal of all Air Conditioning units.

