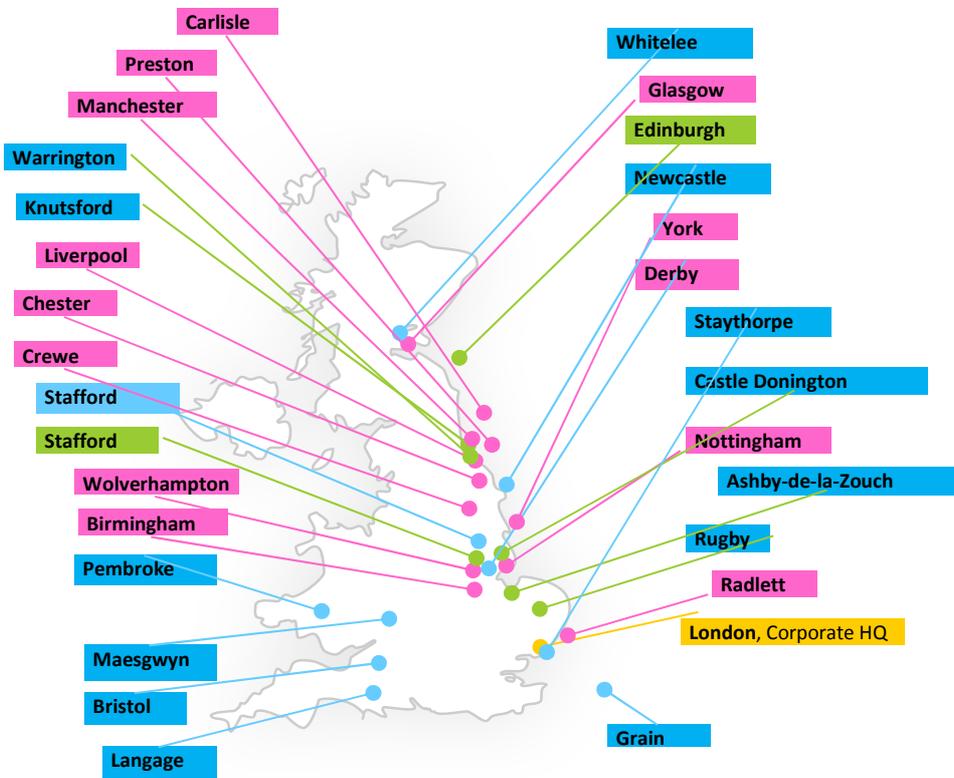


Alstom in the United Kingdom

References and Ongoing Projects

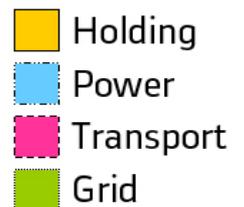


Alstom's UK Presence



KEY DATA

- Over 6,500 people employed in the UK
- Alstom is the largest private employer in Stafford with c1,700 people
- UK turnover 2013/14 was £1.2bn



Alstom in the United Kingdom

References and Ongoing Projects

History

Over the last 200 years, Alstom in its many guises has been involved in Stephenson's Rocket, helped develop the light bulb, electrified the UK's first railway, helped create the first aircraft jet engine with Sir Frank Whittle, worked with Alan Turing on the (then) world's fastest computer, provided the jet engine for Donald Campbell's Bluebird hydroplane, worked on Britain's first nuclear power facility, delivered the world's first pumped storage facility in Scotland, and provided Eurostar's trains on Britain's first high speed rail line.

1989: UK company GEC merges with Compagnie Générale d'Electricité (CGE) to become GEC ALSTHOM (changing its name to ALSTOM in 1998*).

1989: GEC ALSTHOM acquires UK transport company Metro Cammell.

1990 - 2000: Production of Eurostar, Jubilee and Northern Line fleets, Arlanda and various regional electric and diesel trains.

2007: Creation of Signalling Solutions – a joint venture between Alstom and Balfour Beatty Rail.

2007: Rugby celebrates the launch of a new Alstom steam turbine technical training facility.

2007: Alstom delivers the final section of the high speed Paris-London line and its first high speed line project in the UK.

2008: Opening of a Generator Engineering Centre in Stafford to provide training on generator technology.

2009: Alstom completes first wind project in the UK at Clachan Flats in Scotland.

2009: Alstom opens a new welding facility in Stafford in response to a national skills shortage.

2010: Alstom completes biomass project at Drax power station, reducing the plant's CO2 output by c. 2.5 million tonnes per year.

2010: Alstom opens a lifting and rigging training facility in Rugby to address industry recognised safety requirements.

2010: Alstom opens a new Pendolino maintenance facility in Liverpool supporting the extension of the Virgin Trains Pendolino fleet.

2011: Acquisition of UK-based IT expert Psymetrix to support global expansion of Alstom Grid.

2011: Alstom unveils new £4m service centre at its Grid facilities in Stafford.

2011: Alstom awarded €350 million share of contract for Tramlink consortium to construct and operate two new Nottingham tram lines.

2012: Alstom, Drax and BOC form Capture Power Limited and launch 'White Rose Carbon Capture and Storage project'

2012: The largest Combined Cycle Gas Turbine power station in the UK – officially opened in Pembroke – supplying power to around three and a half million homes.

2012: Alstom signs agreement to acquire Tidal Generation Limited (TGL), which specialises in the design and manufacture of tidal stream turbines.

2012: Alstom awarded contract to supply and service equipment for new gas-fired power station at Carrington, Manchester.

2012: Alstom hands completed Grain power station to the customer, EON.

2012: Alstom celebrates 50 years of HVDC at its Stafford site and opens new manufacturing facility.

Partnerships

Power

Capture Power Ltd

Capture Power Limited was formed in early 2012 by a consortium consisting of Alstom, Drax and BOC. Capture Power will be responsible for the development, implementation and operation of the proposed White Rose Carbon Capture and Storage Project, with Alstom building the power station.

Alstom in the United Kingdom

References and Ongoing Projects

Transport

ABC Electrification

ABC Electrification is an alliance comprised of Alstom, Babcock and Costain, three market-leading companies in design, engineering and delivery. ABC Electrification offers focused turnkey solutions for the UK market drawing on experience of the partners in the UK and mainland Europe. Alstom provides global electrification experience and product portfolio, Babcock brings trusted UK project delivery and Costain brings civil engineering innovation and major project management.

ATC

Alstom, TSO (Travaux Sud Ouest) and Costain have formed a Joint Venture (JV) known as ATC to fit out and commission Crossrail's tunnels with the track and equipment necessary for trains to operate from 2018. Alstom and Costain have won two further Crossrail contracts related to traction and non-traction power supplies.

Tramlink Nottingham

Tramlink Nottingham is a consortium consisting of Alstom Transport, VINCI PLC, Keolis and Wellglade (owners of local bus operator's Trent Barton) as industry partners and Meridiam and OFI Infravia as financial investors. Tramlink was awarded a contract to develop an extension to the city's tram service in 2011. Alstom is drawing on its worldwide expertise in infrastructure and turnkey projects for the construction of the new track, power, signalling and the supply and maintenance of 22 Citadis trams as well as the maintenance of the existing 15 Line One trams over the 23-year period.

Signalling Solutions Ltd

Alstom's signalling technology and activities are managed in the UK through a joint venture with Balfour Beatty Rail Projects. The Company provides the industry with an all-round integrated supplier, unique in the market.

Grid

SEESA

The South East Electricity Substation Alliance is part of National Grid's Electricity Alliance in England and Wales, formed to deliver a major investment programme to update and develop the high-voltage transmission network. SEESA is a collaboration between Alstom Grid, Mott MacDonald and Skanska.

Corporate Social Responsibility

Advanced technology and new business models can contribute to solve social and environmental issues. In the UK, Alstom leads in designing innovative, environmentally-conscious technology solutions for power generation, power transmission and rail transport by focussing on the following areas:

- **Ethical Commitment:** In 2008 the Alstom Group signed the Global Compact. Launched by the UN in 2000, the Global Compact encourages companies to adopt, promote and implement a set of key values spanning human rights, labour standards, environmental protection and non-corrupt business practices. The move reflects the Group's commitment to support the Universal Declaration of Human Rights adopted by the United Nations, along with the fundamental conventions of the International Labour Organisation and the OECD.
- **Engineering Education:** With a significant engineering skills gap in the UK, Alstom has an important role to play in encouraging awareness of engineering skills as well as in training for our own employees. We have four training facilities, graduate engineering programmes and significant commitments to apprenticeships in both our rail and energy sectors.
- **Environment:** Our products, plants and people all have an impact on the environment. We are working hard on mitigating this impact. We are CEMARS accredited and have aggressive zero waste methodologies on our sites.
- **Health & Wellbeing:** The health and wellbeing of our people is essential for both happiness and productivity – we have a number of programmes dedicated to employee wellbeing including the global corporate challenge and cycle to work schemes.

Alstom in the United Kingdom

Awards and Certification

- November 2012: Grid UK win gold award at Alstom's 2012 Innovation Award with 24 MW VSC HVDC Demonstrator.
- November 2012: Alstom Transport win three awards for reliability: **Golden Spanner** awarded to the South West Train's class 458, as 'the most reliable train in the UK' in collaboration with Stagecoach South West Trains (SSWT) and two **Bronze Spanner** awards to the Great Western class 180 and ScotRail class 334.
- October 2012: Alstom Transport Nottingham Express Transit named as joint light rail project of the year at **Light Rail Awards**.
- February 2012: Alstom Transport's environmental efforts are recognised at the **Rail Business Awards**, with a highly commended award for **Environmental Innovation** for its initiative to reduce waste generated from train maintenance activities.
- November 2011: Alstom Power's A Peter Willans' Central Valve Steam Engine situated at the Alstom Rugby site, receives the **Institution of Mechanical Engineers (IMechE) Engineering Heritage Award**.
- October 2011: Alstom Power's UK Apprentice is crowned '**BOC Apprentice Welder of the Year**' after competing against nine opponents.
- October 2011: Alstom Power's team working on the Pembroke combined cycle power plant in Wales are recognised for their firm commitment to EHS with a **Sword of Honour** from the **British Safety Council**.
- June 2011: Alstom Power's UK apprentice is named **BOC English Apprentice Welder 2011** after successfully competing against some of the top apprentices in the country.
- May 2011: Alstom Power's two apprentices participate in the **BOC Welding Competition Regional Finals** and take 1st and 3rd place.
- February 2011: Alstom Groups awarded **CEMARS (Certified Emissions Measurement and Reduction Scheme) accreditation** by Achilles, in recognition of its commitment to measure, manage and reduce its greenhouse gas emissions.
- February 2011: Alstom Transport receives 'highly commended' awards at the **Rail Business Awards: Supplier Excellence of the Year**, for the Pendolino H2 overhaul, and **Internal Communications Excellence** for a campaign to improve safety performance.
- January 2011: Alstom Power's built co-firing biomass facility at Drax Power wins '**Best Environment Project**' at the Utility Industry Achievement Awards.
- Alstom Group: all Alstom UK sites are **ISO 14001** and **BS EN ISO 9001** certified.
- Alstom UK Transport has **Link-up Rail supplier approval** and participates in the **Rail Industry Supplier Approval Scheme for bogie overhaul**.

Power

Alstom has provided equipment for around half of the UK's installed base for power generation, and services over half of the UK power fleet. It is the UK market leader for gas and steam turbine equipment for coal, gas and nuclear plants, with over 45% of market share. The UK is lead centre for steam turbine retrofit activity, including tender and capture, engineering, procurement, project management and installation. Alstom's boiler retrofit unit is a centre of expertise for biomass co-firing and has experience in all types of boiler retrofitting, including NOx reduction, performance improvement and fuel flexibility. Alstom Power employs around 3,000 people in the UK.

Reference Projects:

- *Pembroke Power Station, Wales (RWE npower)*: Construction of the 2160 MW KA26 combined-cycle power plant was completed in 2012, making it the biggest and one of the most efficient in Europe. It will supply enough energy to power three million homes with an annual reduction of CO2 emissions by six to ten million tonnes (compared to a coal-fired power station).
- *Grain Power Station, Kent (E.ON)*: Alstom built the largest combined heat and power plant in the UK. The Grain plant is a 1,275 MW combined heat and power plant (CHP) located at the Isle of Grain in Kent. Alstom has a long-term service agreement with E.ON for a 12-year period
- *Daya Bay Stator*: In early 2012, the Generator Service Factory at Stafford finished building its largest stator in recent years. The stator will become an integral part of the generator system at Daya Bay Power Plant, supplying power into mainland China and Hong Kong.
- *Langage Power Station, Devon (Centrica)*: Completed in 2010, Langage is a 900MW, turnkey GT26-based combined-cycle power plant. It hosts the largest ever installed ICS™ (Integrated Cycle Solution) boiler. Alstom will provide maintenance and operation support to Langage for an initial 12-year period under a long-term service agreement.
- *Staythorpe Power Station, Nottinghamshire (RWE npower)*: Completed in 2010, Staythorpe is the second largest gas-fired power plant in the UK, at a power output of 1650MW. Alstom will provide operation and maintenance support to the station up to the first major inspection of each machine, as well as a Long Term Spare Parts Agreement for the first 20 years of plant operation.
- *Maesgwyn Onshore Wind Farm, Wales (Pennant Walters)*: Marking Alstom's first wind farm contract in Wales, Maesgwyn was commissioned in April 2011 and now supplies clean energy to around 30,000 homes. Further to supplying, installing and commissioning the wind farm, Alstom will provide operation and maintenance for five years.

Alstom in the United Kingdom

References and Ongoing Projects

- *Clachan Flats Onshore Wind Farm, Scotland (Scottish Power Renewables)*: The first Alstom onshore farm in the UK was supplied, installed and commissioned at Clachan Flats. Officially opened in 2010, Clachan Flats consists of nine Alstom ECO 74 turbines generating 15MW of clean, green energy that generate enough electricity to power over 8,500 homes.
- *Whitelee Onshore Wind Farm, Scotland (Scottish Power Renewables)*: Alstom has installed 69 ECO 100 wind turbines, each with an output of 3MW, and six ECO 74 wind turbines, each with an output of 1.67MW, at the Whitelee wind farm, south of Glasgow. The contract included supply, transportation, installation, commissioning, and operation and maintenance.

Ongoing Projects:

- *Carrington*: In October 2012 Alstom was awarded a contract to supply and service equipment for a new gas-fired power station at Carrington, Manchester. The 880MW power plant will be built under an Engineering, Procurement and Construction (EPC) contract. Duro Felguera will be responsible for construction and site management. Alstom will supply two GT26 gas turbines and other key components, including the steam turbine, heat recovery steam generator (HRSG) and turbogenerator. Additionally, Alstom has been awarded a 16-year service agreement to maintain this equipment once it enters commercial operation. Carrington project is scheduled for completion in 2016.
- *White Rose Project*: As a consortium, Alstom, Drax and BOC have formed project company Capture Power Limited and is bidding for funds through the Government's UK Carbon Capture and Storage (CCS) competition, for their 'White Rose CCS Project'. This project will burn coal with the potential to co-fire sustainable biomass and be fully equipped with CCS technology from the outset. The 426MW (gross) power plant will be located on land adjacent to the existing Drax Power Station.

Transport

Around a third of the UK's rail vehicles were made by Alstom. In the UK, Alstom Transport employs 2,500 people at over 20 locations. Alstom has full service provision and technical support contracts with a number of train and metro operating companies, notably for the Alstom designed and built Pendolino fleet for Virgin Trains. Alstom built around half of the current fleet of metro trains running on the London Underground and today provides maintenance for the Northern Line fleet. Alstom provides dual expertise as the company's UK supplier of spare parts and logistics and global centre of excellence for lifetime traction support and is the only traction system-engineering knowledgeable organisation in the UK.

Reference Projects:

- *High Speed 1*: In 2007, Alstom led an integrated joint venture to deliver system infrastructure for the final section of High Speed 1, to bring the Alstom-built Eurostar trains to St Pancras Station in central London.
- *Jubilee Line*: Alstom completed fitment of new signalling technology and control on the London Jubilee Line to increase the frequency of the trains, crucial for supporting the 2012 London Olympics.
- *Virgin Pendolino, West Coast Mainline*: Delivery of 53 Pendolino tilting trains to operator, Virgin Trains, in 2004.

Ongoing Projects:

- *Signalling Solutions*: UK rail infrastructure owner Network Rail awarded Signalling Solutions Ltd a framework agreement to design and develop a European Train Control System (ETCS level 2) using Alstom's proven ERTMS technology. The collaborative framework agreement covers a one-year development phase in which Signalling Solutions and three other suppliers will propose their designs.
- *Nottingham Tram*: First turnkey tram project won in the UK for the Tramlink Nottingham consortium. This contract represents a major breakthrough for Alstom, which has supplied 22 Alstom-built Citadis trams to the UK, a product that has already seen success in Dublin and other cities throughout the world. Passenger services across the whole of the expanded tram network are planned to be fully operational by mid-2015.
- *Northern Line, London*: Alstom maintains the 106 Alstom-built trains operating on Europe's busiest railway line, carrying over 800,000 passengers per day. Alstom has a full service contract until 2027 with an option to extend to 2033.
- *Regional Trains*: Alstom built and maintains 27 Coradia DMU sets for train operator Arriva Trains Wales. The maintenance contract runs until 2018.

Alstom in the United Kingdom

References and Ongoing Projects

Grid

Alstom Grid employs around 1,400 people in the UK across three sites in Stafford, specialising in High Voltage Systems (SPL) and Power Electronics Systems (PES). It is a global competence centre for offshore substations, High Voltage Direct Current (HVDC) and Flexible Alternating Current Transmission Systems. Also located at the site is a main manufacturing and development centre for Automation, encompassing Substation Automation Systems, which offers everything from individual relays through to complete systems for all voltages in the distribution and transmission power market.

Its transformer factory is the only one of its kind in the UK, specialising in the design, manufacture and erection of large, complex and non-standard power transformers. Their customers extend beyond the boundaries of the UK to the worldwide power community.

The businesses are complimented by a dedicated Service division offering experience and expertise for installation, maintenance, repair, retrofit, refurbishment and emergency support.

Innovation is core to Grid's presence in the UK with technical competence centres located in key product lines and advanced research led by Alstom Grid Research & Technology. Where possible, Grid works with our customers, suppliers and leading Universities to fast track latest innovations. In addition, we are engaged in shaping the UK and European technology roadmaps through involvement in key working groups and strategic UK and European research and demonstration projects.

Grid has contributed to the Department for Energy and Climate Change's (DECC) House of Commons two volume report on The Future of Britain's Electricity Networks

Grid represents the UK's T&D businesses on the DECC/Ofgem Smart Grids Forum which is setting future grid structures policy and technologies for grids of the future to enable the UK to meet its carbon reduction targets.

Reference Projects:

- *Rio Madeira HVDC Project:* In early 2012, Alstom Grid in Stafford completed the manufacture and testing of four High Voltage Direct Current converter transformers, destined for Brazil's Rio Madeira project, the longest Direct Current transmission line in the world.
- *Sheringham Shoal Offshore Wind Farm:* The commissioning of civil works for two bays to receive transmission cables from the offshore substation supporting the 315MW wind park via 132kV undersea export cables, to a substation on the landside. The connection was into UKPN's network at Norwich, completed in 2010.
- *Barrow Offshore Wind Farm:* In 2006, Alstom Grid provided the infrastructure and technology to transfer power from the Barrow Wind Farm onto the grid via an onshore substation located in Heysham, North West England.
- *Robin Rigg Offshore Wind Farm:* In 2009, Alstom Grid worked on a turnkey project to connect a 180MW offshore wind farm to the United Utilities Network. The offshore wind farm consisted of 60 wind turbine generators and two separate platforms - Robin Rigg East and West - and was connected in four groups at 33 kV to an offshore 132/33 kV substation.
- *South-West Link (Svenska Kraftnät):* Alstom Grid in Stafford has completed its part of the 1440 MW South-West Link, which connects Barkeryd in central Sweden to Hurva in southern Sweden, using High Voltage Direct Current (HVDC) technology.

Ongoing Projects:

- *National Grid:* Alongside partners Skanska and Mott MacDonald, Alstom Grid leads National Grid South East Alliance, working as preferred partners with National Grid to upgrade and develop the electricity transmission network across the south east of the UK. 25% of all high voltage in South East England is through the National Grid Alliance.
- *Scottish & Southern Energy:* With consortium partner Enterprise, Alstom Grid are delivering a turnkey 11 bay 275/132kV GIS substation at Dounreay, due for completion in 2013.
- *Scottish Power:* Alstom Grid are providing a turnkey 400/275/132kV Air insulated substation at Denny North as part of the Transmission Investment for Renewable Generation incentive set up by OFGEM.
- *Champa (PGCIL):* The Stafford transformer factory is currently building some of the largest transformers they have ever created to help connect the power stations of Champa to Khurukshetra in Northern India using Ultra High Voltage Direct Current technology over a 1,365km transmission line.