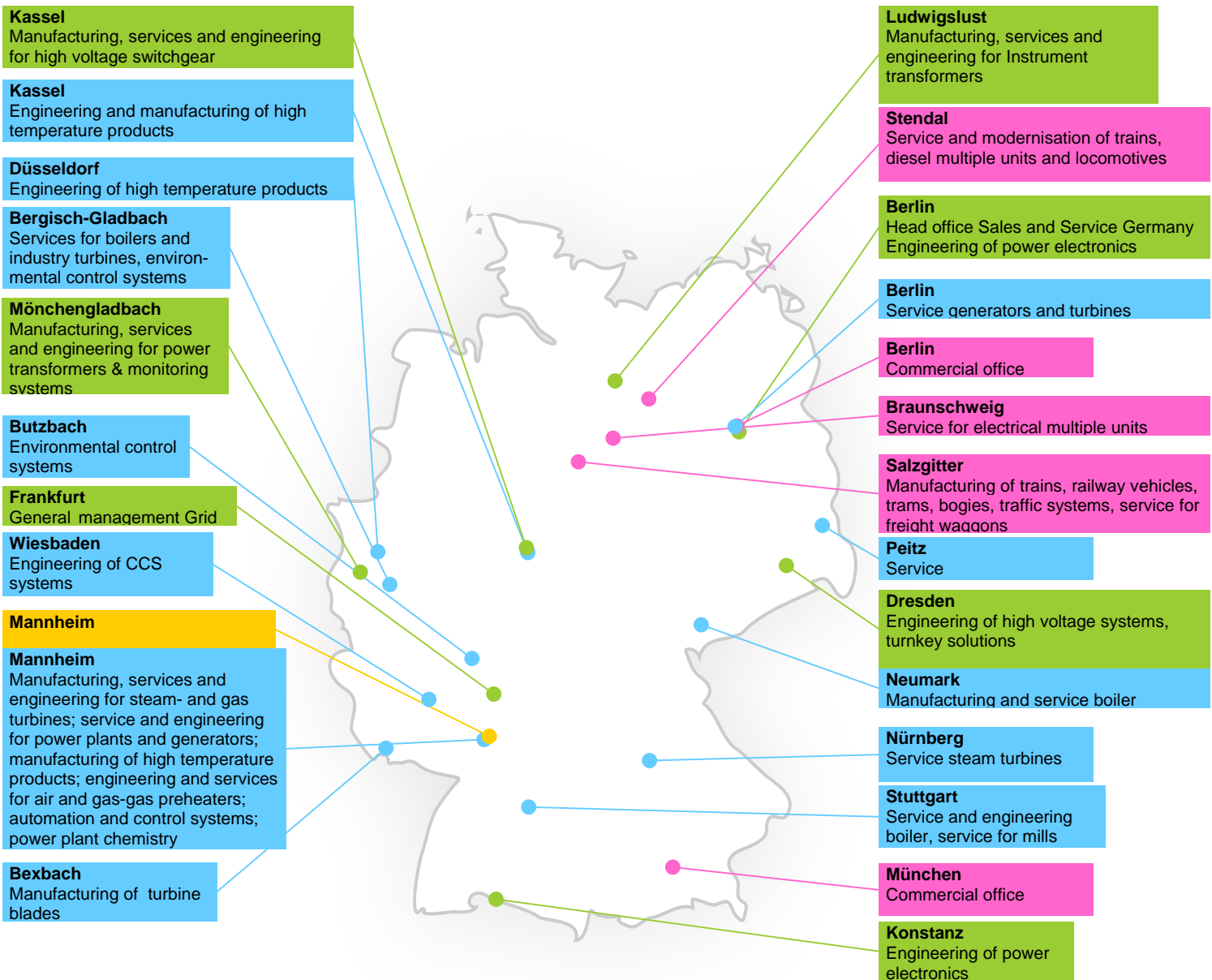


Alstom in Germany

Alstom Germany has a major industrial presence with a strong and advanced product portfolio



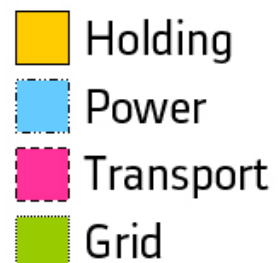
Alstom's Presence



Key Data

- Workforce of 9,000 people
- 23 main sites in 14 Bundesländer

Alstom Germany, February 2012
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History

- 1882:** Founding of Deutsche Edison-Gesellschaft für angewandte Elektrizität (DEG) which was renamed Allgemeine Elektrizitäts Gesellschaft – General Electric Company (AEG) in 1887. (Grid)
- 1900:** Founding of Brown, Boveri & Cie. (BBC) Germany in Mannheim; factory in Mannheim/Käfertal. (Power)
- 1910:** Founding of Schmidt'sche Heissdampf Gesellschaft mbH (SHG) in Kassel. (Power)
- 1912:** The company Linke KG merges with the railway freight car builders Gebrüder Hofmann, of Breslau. The new company is named Linke-Hofmann-Werke AG (LHB). (Transport)
- 1928:** The company Linke-Hofmann-Werke AG merges with the company Waggon- und Maschinenfabrik AG (earlier known as Busch) of Bautzen. (Transport)
- 1950:** The company, known as Linke-Hofman-Busch (LHB), starts new again in Salzgitter-Watenstedt, Germany, with organisation as a syndicate with the company Fahrzeug und Maschinen GmbH (FAMAS). (Transport)
- 1970:** Founding of the company EVT Energie- und Verfahrenstechnik GmbH in Stuttgart, with acquisition of the steam-generation activities of the following companies: Buckau R. Wolf AG, Grevenbroich; Walther & Cie AG, Cologne; KSG Kohlenscheidungsgesellschaft GmbH, Stuttgart. (Power)
- 1989:** Founding of ABB Kraftwerke AG (KWE). (Power)
- 1997:** Linke-Hofman-Busch (LHB) is acquired by the international group GEC ALSTHOM which now holds 100% of the shares in LHB. (Transport)
- 1998:** The company Linke-Hofmann-Busch now does business under the name ALSTOM LHB GmbH. (Transport)
- 2000:** Founding of ALSTOM Power Generation AG. (Power)
- 2009:** Alstom LHB GmbH becomes ALSTOM Transport Deutschland GmbH. (Transport)
- 2010:** Founding of ALSTOM Grid GmbH. (Grid)

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Partnerships

Alstom in Germany is in strategic partnership with associations from the industry and with technology research centres to further enhance the environmental use and efficiency in power generation, power transmission and public transportation.

Selected technological and R&D partnerships:

Industrial Associations

BDI – Bundesverband der Deutschen Industrie e.V.
BWE – Bundesverband WindEnergie e.V.
VDMA (FVV) – Verband Deutscher Maschinen- und Anlagenbau
VGB – Vereinigung der Großkesselbesitzer e.V.
IZ Klima – Informationszentrum für CO₂-Technologien e.V.
VDB – Verband der Bahnindustrie in Deutschland e.V.
VDI – Verein Deutscher Ingenieure
VDE – Verband der Elektrotechnik Elektronik Informationstechnik e.V.
VDEI – Verband Deutscher Eisenbahn-Ingenieure e.V.
WAB – Windenergieagentur Bremen / Bremerhaven e.V.
Wind Energy Network Rostock e.V.
ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e.V.

Helmholtz Society

Deutsches Zentrum für Luft- und Raumfahrt (DLR) Köln und Stuttgart
Forschungszentren (FZ) Jülich und Karlsruhe
Bundesanstalt für Materialforschung und –prüfung (BAM) Berlin
Materialprüfungsanstalt (MPA) Darmstadt und Stuttgart

Max-Planck and Fraunhofer Society

MPI Stuttgart und Düsseldorf
FhI Freiburg

Research and test centres

Deutsches Zentrum für Luft- und Raumfahrt (DLR) Braunschweig
Frankfurter Institutes
Climatic tunnel, Vienna
DB test facilities

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Corporate Social Responsibility

Building tomorrow's company - Partnerships with universities and sponsorships:

Partnership with the Dual Academy in Mannheim

Alstom finances and developed together with the Dual Academy an online Maths test named MathX³ to provide schoolchildren (from grade 11 onwards) a tool, which shows them that knowledge in Maths is applicable in real life and shall interest them in starting a study of engineering. The test is separated in three levels of difficulty and has a lot of practical examples in the power generation market.

<http://moodle.dhbw-mannheim.de/kompetenzzentrum/login/alternateloginurl.html>

Partnership with the Academy in Mannheim

The competence centre of energy efficiency and power plant services of the Academy in Mannheim and Alstom Power Thermal Services have a partnership concerning a collective knowledge-sharing through lectures and scientific works.

<http://www.kke.hs-mannheim.de/>

Alstom in Germany

References and Ongoing Projects

Power

Alstom Power presence in and contribution to Germany

Alstom Power employs a workforce of 4,600 people who are working on 12 sites.

Achievements

- Alstom is market leader in terms of environmental protection and pace maker for CCS technology.
- Alstom is involved in the modernisation of German power plants in a capacity of 11 out of 16 GW.
- Reference Emsland power plant has 59,3% efficiency in gas fired technology.

Main customers

- EnBW
- E.ON
- GKM
- RWE
- Vattenfall

Industrial footprint

- Turbines and Generators
- Gas-/Coal-/Hydro Power Plants
- Boiler
- Flue gas cleaning systems
- Service

All Service products and systems for:

- Steam and Gas Power Plants
- CCPP
- Hydro and Turbo generators
- Boilers

Service Port-Folio:

- Inspections, overhauls, spares, upgrades
- Consulting & studies
- Long-term service agreements
- Operation & maintenance

References

- Neurath F & G – Eng., ST & Boiler (consortium with HPE); conv. steam 2x1.100 MW
- Emsland (Lingen) - TK; CCPP 870 MW
- Westfalen (Hamm) - Boiler; conv. steam 2x800 MW
- GKM 9 - ST & Boiler; conv. steam 1x910 MW
- RDK8 - TK; conv. steam 1x910 MW
- Boxberg - ST; conv. steam 1x670 MW
- Schwarze Pumpe / Oxyfuel; conv. steam CCS 1x30 MW
- Moorburg - ST; conv. steam 2x820 MW
- Datteln - ST; conv. steam 1x1.100 MW
- Staudinger 6 - ST; conv. steam 1x1.100 MW

Projects

- Jänschwalde - spare LP rotor (Vattenfall)
- Jänschwalde units B, E, F - ST (Vattenfall)
- Mannheim 9 (GKM AG), TPBN & TPSN
- Karlsruhe 8 (EnBW), TYSTP
- PCK Schwedt 4 - OEM Plant services
- Westfalen (RWE), TPBA

Alstom in Germany

References and Ongoing Projects

Transport

Alstom Transport presence in and contribution to Germany

Alstom Transport employs a workforce of 2,800 people who are working on 5 sites.

Achievements

- Alstom is the strongest player in diesel multiple units (DMU) and electrical multiple units (EMU) in Germany.
- The manufacturing capability of Salzgitter site is of approximately 150 trains and up to 1,000 bogies per year.
- Each year, about 4,000 freight wagons can be repaired in Salzgitter.

Main customers

- Arriva
- Deutsche Bahn AG
- Hamburger Hochbahn
- Hessische Landesbahn (HLB)
- Landesnahverkehrsgesellschaft Niedersachsen (LNVG)
- Swedish customers (Östgötatrafiken, Skånetrafiken)
- Veolia

Industrial Footprint

- Rolling stock
Electrical and diesel-electrical railed vehicles for city- regional- and long distance rail transport
Freight waggons
Components (bogies eg)
- Service, refurbishment and maintenance
Repair and maintenance for Alstom and non-Alstom trains, locomotives and freight waggons
Spare parts
- Signalling and infrastructure
Train control and monitoring systems
Train information systems
Track laying, electrification, and the supply of electromechanical equipment

References

- 462 ET 423 urban trains
- 452 Trams for Hannover, Braunschweig, Magdeburg, Darmstadt, Gera
- 439 DT2-4 Metros for Hamburger Hochbahn
- 136 "S-Togs" for Danish Rail (DSB).
- 84 ET 422 urban trains for North Rhine-Westphalia (in consortium)
- 43 Coradia Duplex for SJ, Stockholm.

References (ongoing)

- 141 Coradia Continental Electrical Regional Trains for Deutsche Bahn (Augsburg, Munich-Passau, Wuerzburg) and private operators.
- 193 Coradia Nordic Electrical Regional Trains for Sweden.
- 621 Coradia Lint Diesel Regional Trains for Deutsche Bahn and private operators.
- 100 RegioCitadis Regional Trains for Kassel and Den Haag.

Further Projects

- 27 DT5 metros for Hamburger Hochbahn.
- 177 ET 430 urban trains for DB Regio.
- Renovation, inspections and maintenance of (diesel) locomotives (Stendal site)
- Installation of train control and monitoring system ETCS into 10 ICE's.
- To equip 121 trains of Deutsche bahn (DB) fleet ICE with its signalling ERTMS (European Rail Traffic Management System) based-train control solution Atlas. Trains to be equipped are 71 ICE-T tilting trains and further 50 ICE3 trains.

Alstom in Germany

References and Ongoing Projects

Grid

Alstom Grid presence in and contribution to Germany

Alstom Grid employs a workforce of 1,400 people who are working on 7 sites and in 11 Sales offices.

Achievements

- More than 40,000 high voltage switchgears sold worldwide from Kassel site in the last 10 years - more than 4,000 high voltage switchgears from Alstom Grid are in operation in Germany.
- More than 1,000 power transformers have been delivered with a total output of 100,000 MVA, 50% of them for Germany (also in the last 10 years). Today, every 4th power transformer in Germany is from Alstom Grid.
- Over 30,000 instrument transformers have been manufactured and integrated into the grid.
- All German MSCDN systems (mechanically switched capacitor with damping network) have been realized by Alstom Grid.
- Delivered electro-technics for the first offshore substation in Germany (alpha ventus).
- Connected Europe's largest onshore wind farm Tariverde, Romania to the grid.

Main customers

- 50 Hertz Transmission GmbH
- Amprion GmbH
- Deutsche Bahn AG
- EnBW Transportnetze AG
- E.ON
- RWE
- Tennet TSO GmbH
- Vattenfall
- Wind energy business (onshore, offshore)

Industrial footprint

- Turnkey projects: HV substations
- Power electronics
- Power transformers and monitoring
- Instrument transformers
- HV switchgear
- Generator circuit breakers
- HV circuit breakers
- Disconnectors
- Network management solutions
- Service maintenance, repair, retrofit, asset management, spare parts & training

References

- Power transformer order (850/1100 MV) for Vattenfall Europe
- Turnkey order from Bard Engineering for offshore Wind park Veja Mate
- Turnkey order from Wetfeet Offshore Windenergy for Global Tech I
- Electro technical components for power plant expansion of Boxberg unit BoxR
- New construction of 380kV switchgear unit Osterath for Amprion GmbH
- Power compensation systems for TenneT TSO GmbH
- Air and gas insulated substations for municipalities

Projects

- Several orders for self-floating and self-installing offshore substations - Global Tech 1 und Baltic 2
- Power transformer order for Vattenfall Generation
- Power transformer order for E.ON
- Further turnkey projects for offshore-substations, eg. Baltic 2, Borkum West II
- 2 frame contracts for the delivery of circuit breakers 110 and 420 kV by Amprion
- Turnkey project for the reconstruction of 110-kV-substation VAW Jenfeld by Vattenfall
- Air core reactors for offshore wind farm Baltic 1 for 50Hertz GmbH
- Development Agreement with PNE WIND AG for turnkey of a platform for Godewind II