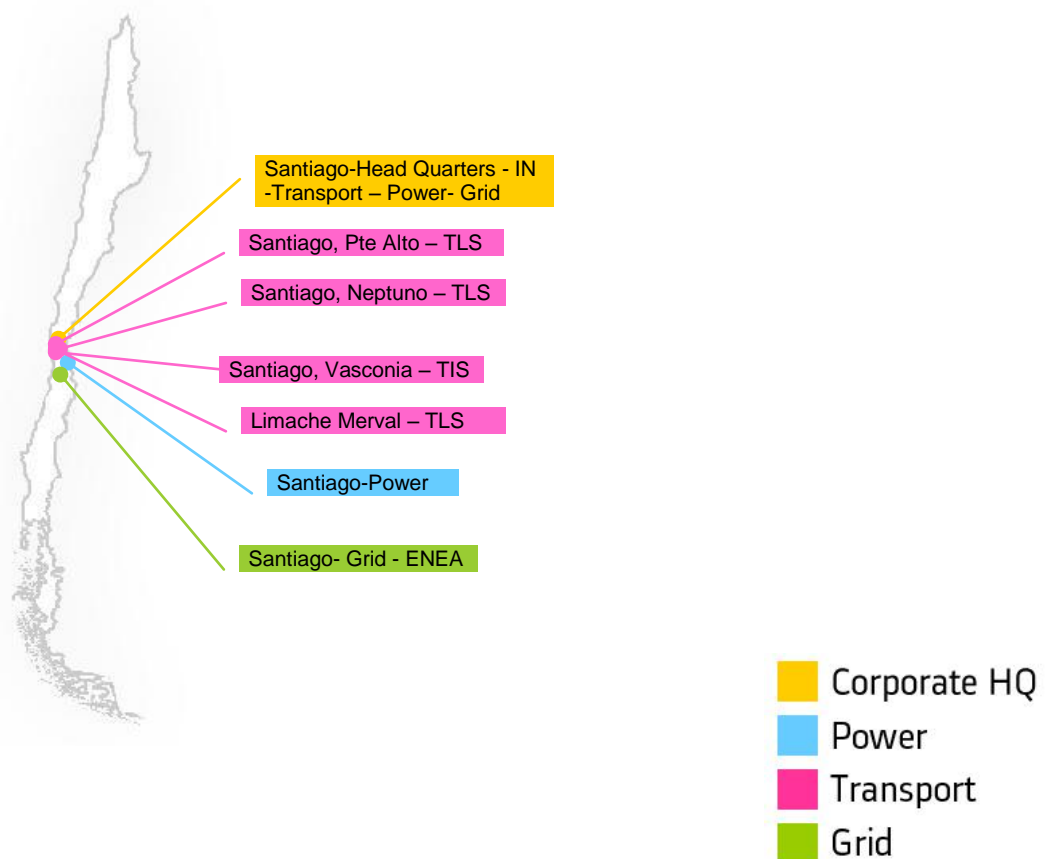


## Alstom in Chile

Over 50 years of contribution to the energy, transmission and transport markets



## Alstom Presence in Chile



### INFORMATION & KEY FIGURES

- Alstom Chile S.A.
- 7 sites.
- 423 employees.

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### History

**1974:** GEC-ALSTHOM International supplies the first 250 metro cars (NS74 type), tracks and signalling equipment for the inauguration of the subway in Santiago, Chile's capital city.

**1997:** GEC-Alsthom Chile S.A. is formed

**1998:** GEC-Alsthom acquires Cegelec (electrical contracting)

**1999:** Alstom and ABB merge their energy businesses in 50-50 joint companies. In Chile, Alstom Chile S.A. and ABB Alstom Power Chile S.A. are formed.

**2000:** Alstom acquires ABB's share in ABB ALSTOM POWER. The company in Chile is named Alstom Chile S.A.

**2002:** Alstom is awarded a contract to provide turbines, generators, transformers and electro mechanical equipment for Ralco Hydro Power Plant, 690 MW declared capacity.

Alstom in consortium with Mitsubishi awarded a major contract to build transmission lines 500 KV, one substation 550KV/220KV, autotransformers 750 MVA, reactors 500kV and digital control systems, to be connected from Ralco Hydro Power Plant to Chile's southern electric grid SIC.

Alstom is awarded a contract to supply 180 Metropolis tm (AS02 type) cars to Metro.

**2004:** Alstom sells its transmission and distribution activities to Areva.

**2010:** Alstom acquires Areva's Transmission activities forming a 3rd Sector named Alstom Grid. In Chile the company is named Alstom Chile S.A. and Alstom Grid Chile S.A.

**2012:** project Lo Aguirre Substation which scope is engineering, supply, erection and commissioning, tests and start up.

Communication Based Train Control (CBTC): supply, installation, tests and maintenance of the CBTC system for line 1 of Metro of Santiago de Chile network.

### Corporate Social Responsibility

#### Alstom Foundation projects

##### ECO-MODEL SCHOOL QUILLAHUE

For third year consecutive Alstom Chile project is awarded by Alstom Foundation. The company recovered more than 3.800m<sup>2</sup> area, transforming them into green areas, playgrounds and sports facilities in the commune of Lo Prado, where a Metro of Santiago workshop is based. In 6 hours, company's volunteers, Mi Parque Foundation and neighbours handed out the renovation of several areas of the school, potentially benefiting more than 800 people.

##### RECONSTRUCTING CHILE

The company participated in the reconstruction tasks, after the earthquake and tsunami of February 27th, 2010. Three multimedia rooms were installed in schools of the Sagrada Familia commune, one of the most affected. Teacher training is also included.

##### A GREEN LUNG FOR PUENTE ALTO

Alstom Chile recovered more than 3.700m<sup>2</sup> green areas in the commune of Puente Alto, where a Metro de Santiago workshop is based. In only one day, company's volunteers, Mi Parque Foundation and neighbours handed out a renovated square including a cycle path, to the commune.

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### Local projects

#### CALCULATING CARBON FOOTPRINT

With the sponsorship of the Ministry of Environment, an ecological calculator that analyses the human carbon track was developed. In the heart of Santiago, Alstom and the Ministry taught the citizenship how to calculate their environmental impact. This is also of great help as educational material and a way to create consciousness within the private company.

#### BICYCLING WITH ALSTOM

Over 350 bicycles were given by Alstom Chile to their employees, as part of the "Cycling with Alstom" campaign. The new bike owner committed to promote a healthy life style and caring about the environment. With the presence of the Ministry of Transport and Environment as well as the authorities of Metro de Santiago, this environmental-friendly transportation was provided, and by this, the delivery act came to an end.

#### ENVIRONMENT DAY

For the last two years, Alstom Chile celebrates the Environment World Day. In this context, the Alstom coworkers have calculated their carbon footprint and began reforesting trees for compensation.

#### ENVIRONMENTAL PROTECTION

Alstom Chile supported the Reforestation Program of the Calan hill, in Santiago.

#### COMPUTER EQUIPMENT DONATION

Alstom Chile gained recognition by the Chile@enter Foundation, reaching third place among 167 companies that donated obsolete computers to this entity.

#### SUPPORTING TECHNOLOGIC DEVELOPMENT

Students of a municipal school, sponsored by Alstom, obtained third place in the national competition of Robotics First Lego League. One of the tests was to capture CO2.

## Awards and Certification

### Alstom Grid Chile

Certified by ISO 9001 (International Organization for Standardization): 2008, certified in 2009 Bureau Veritas.

Certified by OHSAS 18001 (Occupational Health and Safety Advisory Service):2007, certified in 2010 Bureau Veritas.

### Alstom Chile

Certified by ISO 9001 (International Organization for Standardization): 2008, certified in 2010 by AFNOR.

## Alstom in Chile

Over 50 years of contribution to the energy, transmission and transport markets

### Power - References and Ongoing Projects

In Chile, Alstom has been involved in the construction of the main projects that satisfy the country's need for electric energy, being part of the core of both hydro and thermoelectric power stations that supply the electric system. At the moment, it is linked to a 30% of the generated energy through power stations such as Ralco, Pangué, Nehuenco II, Bocamina 1, Palmucho, Tocopilla, Angostura and Gas Atacama.

- **Ventanas Sea Water Flue Gas Desulphurisation (FGD):** turnkey. Client AES Gener.
- **Tocopilla 16:** 412 MW Combined Cycle Power Plant and O&M – Client Suez.
- **Bocamina 1:** Fabric filters Procurement, construction, start-up. Client Endesa.
- **Arauco Constitución:** Electrostatic Precipitator – Engineering, construction, start up. Client Celulosa Arauco.
- **Palmucho Hydro Power Plant:** 320 MW- turbines, generators, transformers and electro mechanical equipment, start up. Cli.
- **Ralco Hydro Power Plant:** 690 MW – turbines, generators, transformers and electro mechanical equipment, start up. Client Endesa.
- **Nehuenco II:** Combined cycle add-on: 138 MW Steam turbine, generator, HRSG, electro mechanical equipment, Engineering, construction and startup. Client Colbún.
- **Gas Atacama:** Combined cycle add-on: 2x139MW Steam turbines, 6 generators, HRSG, electro mechanical equipment, Engineering, construction and startup. Client: Gasatacama

#### Ongoing projects

- **Angostura Hydro Power Plant:** 390 MW – turbines, hydro equipment, start up. Client Colbún, in 2010.
- **Tarapaca:** supply of a particulate removal system using the fabric filter solution. The air quality control equipment will be in full compliance with the new local environmental regulation in Chile. Client: Endesa's Tarapaca coal-fired power plant.

### Grid - References and Ongoing Projects

By the acquisition of Areva T&D's transmission activities in June 2010, Alstom hit a new milestone in its development, forming a new sector named Alstom Grid and becoming one of the three largest world groups dedicated to high voltage energy transmission.

#### References

- **Enlargement El Cobre substation:** 2X220 kV AIS, engineering, civil construction, assembly, protection, control. Client: Alusa. Year: 2009/2010
- **Electric Connection FGD y Bash:** 1X110 kV AIS, civil construction, assembly, protection, control. Client: AES Gener. Year: 2009.
- **El Cobre substation:** 6X220 kV AIS, engineering, civil construction, assembly, protection, control. Client Edelnor. Year: 2009/2010.
- **Emelda substation:** 3X110 kV AIS, 4 Km line 110 Kv, engineering, civil construction, assembly, protection, control. Client: Emelda. Year: 2008/2009.
- **Tamaya Substation:** 9X110 kV AIS, engineering, civil construction, assembly, protection, control. Client: Edelnor. Year:

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2008/2009.

- **Santa María Substation:** 5X220 kV GIS, engineering, civil construction, assembly, protection, control. Client: Colbun. Year: 2008/2010.
- **GNLQ Substation:** 1X110 KV AIS, 4,3 Km underground cables 110 KV, engineering, civil construction, assembly, protection, control. Client AES Gener. Year: 2008.
- **Additional plot to the Torquemada substation:** 1X110 kV AIS, engineering, civil construction, assembly, protection, control. Client: Hydroelectric Power Station La Higuera. Year: 2007/2008.
- **Vallenar substation:** 3X220 KV AIS, transformer 50 MVA, engineering, civil construction, assembly, protection, control. Client: Agrosuper. Year: 2006/2007.
- **Torquemada:** 9X110 Kv AIS, engineering, civil construction, assembly, protection and control. Client AES Gener. Year: 2006/2007.
- **Pacifico Substation:** 1X110 kV AIS, transformer 80MVA, engineering, civil construction, assembly, protection, control.. Client: CMPC. Year: 2005/2006.

### Ongoing projects

- **“Cordillera and Minero Substation”:** 2 bays of 110 kV Capacitor bank supply. Client: Codelco.
- **“Minero Substation”:** 2 bays of 110kV overlines supply. Client: Codelco
- **“Angostura”:** 220kV GIS (Gas Insulated Switchgear) supply and erection supervision to Alstom Power. Client Colbún.
- **“Cobra”** – Engineering, supply assembly and startup of telecommunication system. Client Cobra
- **“Sheraton 2”** – Engineering, supply, assembly and startup of 4 110kV Circuit Breakers. Client: E-CL
- **“Patio 105”** - Engineering, supply, assembly and startup of 1 110kV Circuit Breaker. Client: E-CL
- **“DIP5000 teleprotection Upgrade”** – Replacement of telecommunication cards for upgrade. Client: Transelec
- **“OPLAT T390”** – Replacement and startup of equipment for upgrade. Client: Transelec
- **“El Arrayan Wind Farm”** - Engineering, supply, assembly and startup of telecommunication system. Client: Skanska
- **“Rucatayo”** – Engineering, supply, assembly and startup of telecommunication system. Client: Transrucatayo
- **“Lo Aguirre GIS 500/220 kV Substation”** - Engineering, supply, erection and commissioning, tests and startup of “Seccionadora Lo Aguirre Substation - Etapa 1”. Client: Transelec

## Transport - References and Ongoing Projects

Chile's economic development in the last two decades has increased the need for urban, interurban and cargo rail transport infrastructure. Alstom has the expertise in these three areas and its commitment is to contribute to the enhancement of life quality and people's safety. Just like in other world capitals, Alstom's urban trains are part of Chile's identity. The company has been the main supplier of Metro de Santiago and the modern regional Metro de Valparaíso, offering a complete range of innovative products and services in the country.

**Metro de Santiago:** In 2010, with the extensions of Line number 1 to Los Dominicos and Line number 5 to Maipú, the metro reached an extension of 103 kilometres and today transports more than 2.4 million passengers per day through 108 stations with nearly thousand cars

- 787 cars, 216 are METROPOLIS (MR) units.

## Alstom in Chile

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- CBTC (Communication Base Train Control) for Line 1.
- SACEM (Train Control Automatic System) for Lines 1, 2 and 5 and URBALIS™ 200 system for Line 4.
- Equipment for signage and interlocking for Lines 1, 2, 4 and 5.
- Railroad track for Lines 2 and 5; electrification for Lines 1 and 5.
- Maintenance System TLS (Train Life Service) for the METROPOLIS™ cars, and for 94 NS93 cars and 85 NS04 cars.
- Passenger information service: Agatha e-media.

**Metro de Valparaíso:** Runs between Valparaíso and Limache and 20 Million passengers a year are expected to use this service, covering 43 kilometres. For this project, Alstom provided 54 suburban X'Trapolis cars, train control system, signage and energy supply for the railroad network.

- 54 X'Trapolis cars (interurban)
- Train Control Automatic System
- Signage System with its maintenance
- Power supply
- TLS (Train Life Service) maintenance system for 30 years.

### Ongoing projects

#### Metro de Santiago

- Line 5: Automatic Train Control "SACEM" - project ends 2012.
- Line 1: Communication Based Train Control "CBTC" – project ends 2014.
- Line 1: Maintenance "CBTC" project ends 2017. 5-year optional extension in 2 different opportunities which means it will end in 2027.
- Line 2: 85 cars NS 04 Maintenance – project ends 2014.
- Line 1: 87 cars NS 93 – Maintenance – project ends 2014.
- Line 4: 180 cars AS02 – Maintenance and Overhaul – project ends 2014.
- Line 4 – 36 cars AS02 – Maintenance – project ends 2014.

#### Metro de Valparaíso

- 54 X'trapolis cars – maintenance – project ends 2035.
- Signalling maintenance – project ends 2019.
- Signalling upgrade from 360 to 180 seconds – project ends on March 2014.

#### Empresa de Ferrocarriles del Estado (EFE),

Supply and maintenance of 12 trains for the new suburban service "Rancagua Express".