

Rio Madeira Interconnecting grids



The longest transmission link in the world - 2,375 kilometers.

The Rio Madeira HVDC system is a 6,300 MW ± 600 kV high-voltage direct current transmission system in Brazil built to export electricity from new hydro power plants on the Madeira River in the Amazon Basin to major load centers in southeastern Brazil – a distance of 2,375 km, making it the longest transmission link in the world when commissioned in 2013-2014. A 800 MW back-to-back station is also part of the system.

A consortium consisting of two companies in the Abengoa Group, Inabensa S.A (Spain) and Abengoa Construção Brasil Ltda (Brazil) awarded ABB contracts to supply the power equipment for three HVDC stations. The delivery is part of the Brazilian government's Program to Accelerate Development (PAC).

Brazil's power system is about 95 percent hydroelectric. Main load centers are in coastal regions, especially in the southeastern state of São Paulo.

ABB will provide two 3,150 MW HVDC converter stations, and an 800-MW HVDC back to back station. The two 3,150 MW converter stations are placed at either end of the transmission line, delivering electricity from two new hydropower plants near Porto Velho in northwest of Brazil to the southeast near São Paulo.

The third unit is an 800 MW back-to-back HVDC station that transmits power to the surrounding AC network in northwest Brazil. This installation includes capacitor commutated converter (CCC)-type back-to-back converters instead of conventional

converters for local electrical loads, providing continuous and even control of voltage and power in the weaker power networks of northwest Brazil.

The Rio Madeira transmission link is the second 600 kV HVDC transmission system in Brazil. The Itaipu HVDC project built by ABB in the mid '80s is the first.

Main data:

Commissioning year:	2013
Power rating:	3,150 MW 2 x 400 MW (back-to-back)
AC voltage:	Transmission link: 500 kV Back-to-back: 500 kV and 230 kV
DC voltage:	± 600 kV
Length of DC overhead line:	2,375 km
Type of link:	* Long distance overhead line * Back-to-back station
Main reason for choosing HVDC:	Long distance Back-to-back: Asynchronous networks
Application:	Connecting remote generation Interconnecting grids