

Ingeteam has installed on the Metro de Bilbao system 5 energy recovery systems with feed-back to the grid.

The INGEBER system, integrated on Metro Bilbao substations, is transparent to its operation and solves energy recovery limitations.

Ingeber has been totally deployed on the Metro de Bilbao Network after simulations, preliminary studies and the installation of a prototype, that has been working for more than 1 year.

The system is made up of a double converter, connected to the catenary in parallel with the substation's rectifier, and to the same already existing transformer. INGEBER monitors the state of the catenary at all times, and if there is energy to be recovered, converts it into high quality alternating current, which is fed back to the general three-phase grid.

It is estimated that recovered energy will be of more than 6,000 MWh yearly.

## Systems Characteristics

Catenary voltage:	1,500 Vdc
Alternating voltage:	1,150 Vac
Maximum power:	1,500 kW
Rated power	800 kW
Alternating current, max.:	750 Arms
Direct current max.:	1,000 A
Total harmonic distortion (THD):	< 3%
Output frequency:	50 Hz
Cooling system:	Forced Air



TF 12 DTR 01\_B 08/2012



## Power diagram

