



**ELENA Completed Project Factsheet**  
**Energy Efficient Bus Network for Barcelona**  
**(ELECTROBUS)**

<b>Location</b>	City of Barcelona, Spain
<b>Beneficiary</b>	Transport Metropolitans de Barcelona (TMB), a public transport operator of Barcelona.
<b>CoM signatory</b>	Yes
<b>Sector</b>	Public transport
<b>Total PDS costs</b>	EUR 1 638 336
<b>ELENA contribution</b>	EUR 1 474 502
<b>Project development services financed by ELENA</b>	<p>Project aims to support the Municipality of Barcelona and TMB (Transports Metropolitans de Barcelona) to implement a large scale investment program to retrofit existing diesels and CNG buses into hybrids, including:</p> <ul style="list-style-type: none"> <li>• Technological studies on electric and hybrid buses, and retrofitting</li> <li>• Supporting the definition of tailored financial instruments to finance the bus fleet renewal</li> <li>• Studies for a new bus network</li> <li>• Deployment of electric buses</li> </ul> <p>The buses were to be deployed on a new Bus Rapid Transit (BRT) network called Nova Xarxa. ELENA included TA support to implement electrical buses. Finally, the project also included studies for deployment of LED technologies for traffic signalling. However, this initiative was cancelled, leading to changes in the investment budget and the timeframe. Due to external financial conditions, the retrofitting program was cancelled and replaced by a procurement program for 73 hybrid buses.</p>
<b>Description of ELENA operation</b>	<p>Transports de Barcelona (TB) is the main public bus operator in the City of Barcelona and is working together with Mobility Department (MD) of the City Council to improve urban mobility and public transport services. TB was responsible for the coordination of the ELENA project development services and the ELECTROBUS implementation.</p> <p>The tasks were carried out through an implementation unit, made up by representatives of both entities (TB and MD). This unit incorporated internal staff from the two entities and additional staff (TB) hired exclusively for this project (one technical senior expert and three technical staff). ELECTROBUS also received support from external consultants.</p>
<b>Timeframe</b>	January 2011 – June 2015
<b>Basis for investment identification</b>	<ul style="list-style-type: none"> <li>• Energy efficiency action plan 2000-2010</li> <li>• New energy efficiency, climate change and air quality action plan 2010-2020, including the objectives of the Covenant of Majors (under preparation by the Barcelona City Council)</li> <li>• The ELECTROBUS umbrella program (TB)</li> </ul>

<b>Investment programme description</b>	Development of prototype for retrofitting diesel bus into hybrid electric and procurement of 73 hybrid buses.
<b>Investment in implementation phase</b>	EUR 36 900 000
<b>Expected results</b>	At project start, the expected results were annual energy savings of 61.4 GWh, and annual CO2 reductions of 16 400 eq [t] after a full project deployment. 220 existing buses were expected to be retrofitted, but this program was cancelled and replaced by procurement program for 73 new hybrid electric buses. Tests on hybrid buses in operation have demonstrated energy savings of 25-32%, compared to the previous diesel buses. Savings on emissions are not available.
<b>Leverage factor</b>	25
<b>Lessons learnt</b>	<ul style="list-style-type: none"> <li>• The feasibility of a Bus Rapid Transit system was demonstrated enabling substantial reduced travel times, increased transport capacity and savings in energy and emissions.</li> <li>• The financing plan was analysed and reviewed, and resulted in a modification of the financing using a mix of tax revenue, grants and leasing.</li> <li>• The program for retrofitting was completed by designing and building a prototype, but due to financial constraints retrofitting of a larger fleet was cancelled and replaced by procurement of new buses.</li> </ul>
<b>Further information sources</b>	<a href="http://ajuntament.barcelona.cat/premsa/wp-content/uploads/2015/12/151201-Dossier-participaci%C3%B3-i-NXB.pdf">http://ajuntament.barcelona.cat/premsa/wp-content/uploads/2015/12/151201-Dossier-participaci%C3%B3-i-NXB.pdf</a>  <a href="http://horapunta.tmb.cat/seccio/reportatge/nova-xarxa-bus-continuara-creixent-2015">http://horapunta.tmb.cat/seccio/reportatge/nova-xarxa-bus-continuara-creixent-2015</a>
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