



ELENA Completed Project Factsheet
Transition to Electric Buses and boats in Movia
(TEBB)

Location of planned investments	City of Copenhagen, Denmark
Final Beneficiary	Trafikselskabet Movia, Copenhagen
Final Beneficiary's address	Trafikselskabet Movia, Gammel Køge Landevej 3, DK-2500, Valby Denmark Tlf. dir.: +45 36 13 19 17, Mobil: +45 21 57 20 86
CoM signatory	Both the City of Copenhagen (since 2009) and Roskilde Municipality (since 2009) are members.
Sector	Urban public transport
Total PDS costs	EUR 1 219 621
ELENA contribution	EUR 1 097 659
Project development services financed by ELENA	<p>ELENA funded a team of direct staff (employed or seconded) for the project, together with some sub consultants employed for the PDS services.</p> <p>The program included six work packages (WP), plus a project management component:</p> <p>WP1: Main challenges in tendering WP2: Electric bus services in Roskilde WP3: Electric bus services in Copenhagen area WP4: Electric Harbour bus services in Copenhagen harbour WP5: In-house capacity building WP6: Dissemination</p> <p>The main issues that were funded during the ELENA project included:</p> <ul style="list-style-type: none"> • Final feasibility studies and cost calculations for operation for electric buses and ferries; • Preparation of public procurement of transport services using electric buses and ferries; • Preparation of public procurement of charging infrastructure for electric buses and ferries.

Description of ELENA operation	<p>MOVIA is the regional Public Transport Authority (PTA) in East Denmark, including the capital area of Copenhagen. The scope of the project was to prepare the transition of parts of MOVIA's fleet of rolling stock and vessels from conventional fuels to electric vehicles. The project included studies of technical feasibility and costs for applying electric vehicles/vessels on routes that were to be put out to tender, the preparation of tendering procedures and contracts.</p> <p>Three main actors participated in the project implementation: i) MOVIA was the key player coordinating all the technical analysis, handling the staff resources, the scheduling and planning, etc. ii) Copenhagen and Roskilde municipalities were key in making the political decisions to determine the investments to execute, after the technical studies' recommendations, iii) the bus operators where the ones finally tendering for the contracts to purchase and operate the e-buses in the selected bus routes.</p> <p>The main issues analysed and tackled during the ELENA project were:</p> <ul style="list-style-type: none"> ❖ Tendering of electric vehicles and vessels; ❖ Separating charging infrastructure from e-bus operation vehicles in tenders; ❖ Managing new risks affiliated with operating electric buses.
Timeframe	<p>1 October 2017 – 30 September 2021</p>
Investment programme description	<p>The project resulted in the deployment of approximately 341 electric buses (174 e-buses will enter into operation in 2022), 7 all-electric harbour buses and all related charging infrastructure. In addition, investments in 4 fast-charging stations for e-buses were contracted and deployed.</p>
Investment in implementation phase	<p>EUR 121.1 million</p>
Results expected to be achieved	<p>All investments supported by the ELENA-2016-075 project refer to clean urban transport, in particular the following investments were executed during the project implementation:</p> <ul style="list-style-type: none"> • 341 electric buses • 4 fast-charging stations for the electric buses • 7 all-electric harbour buses (boats) <p>The main target is to reduce GHG and NOx emissions to support Climate Change mitigation. Current estimates is a GHG reduction of 27,855 CO₂eq ton/year and NOx emissions reduction of 63 ton/year.</p>
Leverage factor achieved	<p>110</p>

<p>Lessons learnt</p>	<p><u>Technology is developing fast:</u> The work of inviting tenders for zero-emission buses has taken, and is still taking, place in a fast-developing market. The commercial market has embraced electric bus services and has begun to base business models on it, and today, electric bus services are very much perceived politically as a realistic option. The market expects technology to continue to develop fast and to see better solutions that will extend the driving range of the buses.</p> <p><u>Early market dialogue has played a vital role in the early tender processes:</u> In the first tender processes, Movia took some time to, in different ways, make inquiries or enter a dialogue with the market and this helped the preparation and response to the tenders. This included field trips with the purpose of finding inspiration and gaining experience, analyses to identify potential of technology, as well as dialogue meetings with operators, suppliers, politicians, and other parties interested in zero-emission bus services.</p> <p><u>Selecting which type of tender procedure to use and how to specify it is essential to the final solution model:</u> The lessons-learnt from several tender processes and the framework agreement on the charging infrastructure in public space showed that the type of tender procedure chosen is central and essential to the result of the tender process, i.e. the competitive dialogue with the existing suppliers is a very useful tender procedure to shape the best technological solutions to suit the project needs.</p> <p><u>Functional requirements leave room for innovation:</u> Experience shows that when zero emission bus services are being put out to tender, invitations to tender specifying functional requirements work better than invitations to tender which attach importance to technical requirements. The reason is that functional requirements create space for technological developments because there is no detailed description of how to perform the task from the outset. Instead, the invitation to tender describes the expected environmental requirements and emission levels of e.g. CO₂ and NO_x.</p> <p><u>Movia, operators and municipalities have built up key organizational knowledge and insight from their work with zero-emission buses:</u> Since 2015 when the efforts to introduce zero emission buses really started with the first tender process, employees of Movia, municipalities and operators have built up important organizational knowledge and experience of zero emission bus services. The learning curve has been steep which is why ELENA was very useful to help realise this investment programme. Movia has had to find a new way of carrying out tender processes, the operators have had to adapt their business to electric service, and the municipalities have had to take the bold step of giving priority to a greener, but also more expensive bus fleet.</p>
<p>Further information sources</p>	<p>N/A</p>
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