The Lima E-Bus Project
Advancing electric mobility in Peru
PARTNERING WITH THE PERUVIAN GOVERNMENT

Context
Lima is Peru’s capital and one of Latin America’s largest cities. Its streets are filled with cars, buses, and taxis that run on diesel or have been converted to use gas.

The Global Sustainable Electricity Partnership (GSEP) and member companies Enel X and Hydro-Québec have partnered with Lima’s transport authority and the Peruvian government to add a first electric bus to Lima’s public transit system which has served as a pilot to scale up the integration of electric buses in Peru’s transportation system.

The Peruvian government has clearly indicated that it considers transportation electrification an important step towards meeting its commitment to reduce the country’s carbon footprint by 30% before 2030. A recent study commissioned by the Ministry of Energy and Mines concluded that:

- Electric buses emit 87.7% fewer emissions than diesel buses and 89.1% fewer than natural gas buses
- A fleet of 100 electric buses would avoid 103,339 tons of carbon emissions during 14 years of operation
- Electrifying public transit would reduce over 3,800 deaths due to poor air quality in Lima by 2030

Electrification is one of the key levers that can bring about decarbonization. However, transport electrification is progressing slowly, and the pace of electrification is far behind what is required to meet the Paris Agreement goals.

Vincent-Michel Duval, Executive Director, GSEP
INTEGRATING THE FIRST ELECTRIC BUS TO LIMA'S PUBLIC TRANSIT

Project overview
The bus has been operated by a local operator on one of the busiest arteries in the city, collecting real-time data on speed, battery performance, operations and environmental impact. After a full year of operation, the data was analyzed and compiled into a replicability study that the Peruvian government used to implement large-scale electrification across the country’s public transit systems.

Key objectives

- Introduce an electric bus and charging infrastructure into Lima’s municipal transit system to evaluate e-bus viability and replicability
- Collect real-time data to study the costs, operation, social, economic, and environmental benefits of transportation electrification in Lima and in Peru
- Support the Peruvian government in forging the entry path for electric mobility technology into the country
- Inform and educate the general public, local authorities and transportation professionals about this technology, its benefits and its applications

“Hydro-Québec was delighted to share its vast expertise in electric charging networks with Peruvian stakeholders to allow Lima’s communities to access the environmental, social and economic benefits of electrification.”

Christine Cantin, Manager - Public Affairs, Hydro-Québec
BENEFITING FROM ELECTRIC PUBLIC TRANSPORT

Key lessons learned for this project
ELECTRIC BUSES ADVANCE THE ENERGY TRANSITION

In 18 months of operation, the LimaEbus avoided 94 tons of CO2e emissions compared to a diesel bus or 107 tons of CO2e emissions compared to a gas bus. The project is considered part of the Nationally Appropriate Mitigation Actions (NAMAs) to reduce carbon emissions. A clean public transport system is possible combining e-buses with Peru’s green energy mix.

ELECTRIC BUSES MAKE SENSE ECONOMICALLY

The Lima e-bus costs 30% less to operate than a diesel bus and 17% less than a CNG bus while covering as many kilometers at the end of the day. Significant savings are generated by the lower costs for lifetime maintenance of electric buses compared to those of regular diesel or natural gas buses.

Electric utilities have a key role to play to further accelerate electrification. Enel X is proud to have supported Peruvian stakeholders on their path to achieve the energy transition.

Alejandro Barragan, Managing Director, Enel X Peru
ELECTRIC BUSES ARE EFFICIENT AND RELIABLE

The e-bus **saves a third of the energy** it needs to operate with its on-board innovative technology regenerative braking. It can also circulate as many kilometers as conventional technologies during the day. The e-bus shares its data in real time, which means that the operator can **optimize its performance as well as passenger comfort**. Electric buses also have very few technical failures.

ELECTRIC BUSES IMPROVES PASSENGERS' QUALITY OF LIFE

Passengers have provided very positive feedback for the survey carried out as part of the replicability study. They believe that the e-bus provides a **smoother drive** and appreciate the fact that its operation is **noiseless**. The survey also revealed that **97% of passengers want to see more e-buses in the city of Lima** and 43% consider that the most favorable feature is the air conditioning on board the e-bus.
REPLICATING THE PROJECT

Next steps for Peruvian authorities
GSEP pioneered in developing the **very first technical specifications needed for electric buses to circulate on Lima’s roads**. A first e-bus and its charging infrastructure have been designed, built and donated by GSEP to the transport authorities in Peru.

The data gathered through bus operation was analyzed and compiled into a replicability study that the Peruvian government used to implement large-scale electrification across the country’s public transit systems.

GSEP has also transferred all the technical specifications for the construction of the bus to the Peruvian government, in view of the government’s call for proposal for the purchase of additional e-buses and the **implementation of electric mobility at a larger scale into Lima’s public transit system**.

As part of the project, GSEP also offered technical trainings which have resulted in **transferring knowledge and developing expertise on electric transportation** to facilitate the implementation of electromobility in Peru.

The integration of the first electric bus into the public transportation system of Lima and Callao has complemented our experience in electromobility in a valuable way. It’s encouraged us to adopt concrete actions to speed up and facilitate the large-scale electrification of public transport in our cities.

Maria Jara, Chief Executive, Autoridad de Transporte Urbano - ATU