



USAID Vietnam Urban Energy Security

Scope of Work

Demonstrating an Electric Waterbus and a Business Model

BACKGROUND

As Vietnam experiences steep increases in energy demand and rising air pollution challenges, there is growing recognition that cleaner, more reliable sources of energy are needed and greater capital investment is necessary. USAID Vietnam Urban Energy Security (the Project) works closely with target cities (*Danang and Ho Chi Minh City - HCMC*) to improve enabling frameworks, mobilize investment, and increase the adoption of innovative solutions for advanced, distributed energy.

The overall goal of the Project is “advanced, distributed energy solutions deployed to improve urban energy resilience and energy security” in Vietnam. At its completion, the Project expects to achieve the following high-level results:

1. At least 400 megawatts (MW) of advanced, distributed energy systems deployed in the selected cities.
2. At least \$600 million in public and private investment mobilized for advanced, distributed urban energy systems.
3. At least 20 innovative solutions to address urban energy and environment issues demonstrated and/or commercialized.

To achieve the third high-level expected result, the Project is implementing a range of activities: innovative pilots/ demonstrations are being funded through a competitive Innovation Challenge Fund (ICF); innovative solutions are being identified and piloted/ demonstrated outside the ICF process through discussions with city-level private and government stakeholders and research by the Project’s technical team; and selected innovators will receive tailored support to scale and/or commercialize.

Innovators registered in Vietnam with solutions in the form of new technologies, practices, and business or financing models are being supported through the above activities. Solutions fall within the following categories: transportation, building efficiency, electricity generation, electricity delivery and management, and water efficiency. They must be piloted/ demonstrated in Danang and/ or HCMC.

ELECTRIC WATERBUSES – THE POTENTIAL

According to the Environment Department of the Ministry of Transport (MOT), road transport is the biggest source of emissions by the transport sector as it generates 85 percent of total emissions, followed by internal waterway transport with 8 percent, airways 5 percent, and sea transport 2 percent. Railways generate the smallest volume of emissions. CO₂ emissions volume in the transport sector continues to rise - it is expected to rise to 65 million tons by 2025 and 89 million tons by 2030 (from 47.68 million tons in 2020).¹

Vietnam is committed to reverse these trends. The country submitted its updated climate commitment, its Nationally Determined Contribution (NDC), in 2020, committing to cut GHG emissions between 9% with its domestic resources and 27% with international support by 2030, compared to

¹ <https://vietnamnet.vn/en/vietnam-carrying-out-transport-transformation-to-reduce-emissions-573114.html>

business as usual. At COP26 in 2021, Vietnam announced its goal for net zero emissions by 2050. In July 2022, Vietnam entrenched its net-zero target into law.

Recognizing the role of transport in mitigating the impacts of climate change, Vietnam’s Ministry of Transport is collaborating with other ministries to integrate transport into national strategies and action plans. For example, the National Green Growth Strategy for 2021-2030 highlights transport mitigation and adaptation actions, calls for investment for green transport infrastructure, and prioritizes e-mobility solutions². Vietnam’s city authorities also recognize the need for change.

For cities such as HCMC with large populations and vast river networks, there is scope to introduce carbon free transport options for passengers and goods. Electric waterbuses can contribute to the city’s emission reduction targets and can offer carbon free transport options for its mobile population that seeks convenient, efficient transport options.

HCMC’s internal public boat transfer system is currently limited. There are some transfers provided by commercial enterprises, but these are mainly river front restaurants and entertainment places. Hydrofoil ferries cross the Saigon River from Ho Chi Minh City to the coastal city of Vung Tau several times daily which takes about one and a half hours each way.

HCMC’s Department of Industry and Trade (DOIT) has expressed interest in exploring whether electric waterbuses can offer a viable, pollution and noise free solution to the city’s transport challenges.

ELECTRIC WATERBUSES – THE TECHNOLOGY

Electric motors for maritime use are being developed and manufactured by reputable international manufacturers and are available for both commercial and recreational use for Vietnamese market. According to the Project’s preliminary assessment, the electric engines are suitable for waterbuses with the following indicative specifications:

Passenger capacity:	~50 persons
Distance between each charge:	30 – 40 km
Speed:	up to 20km/h
Running time per charge:	4-5 hours
Engine capacity:	Up to 50 KW

The locally available shipyard facilities can supply conversion of the traditional diesel/gasoline fueled waterbus to electric waterbus. They can also supply newly built electric waterbus ready for demonstration. The belief is that this innovative solution can help foster an alternative means of clean transport for city dwellers, and can reduce the use of fossil fuels and emissions, but scaling has been slow because:

- there is a need to demonstrate the solution to assess its performance, for example in relation to the life and performance of the battery and engine.
- there is a need to further document evidence of the solution’s costs and benefits.
- there is a need to showcase/ demonstrate and promote the solution for the market.

To support HCMC and Danang achieve their energy efficiency targets, the Project seeks an offeror to demonstrate this innovative solution in HCMC.

OBJECTIVES

² <https://thecityfix.com/blog/a-greener-cleaner-and-better-vietnam-through-transport-decarbonization/>

The Project seeks an offeror to pilot/ demonstrate an electric waterbus with the above specifications at a suitable location in HCMC. The offeror will liaise with DOIT HCMC to identify the location that should be representative of other locations where the solution could be rolled out in the future. The Offeror can propose a different specification for the electric engine and the waterbus based on their own assessment of the required standard and actual transportation demand of the location.

The demonstration will be of interest to multiple stakeholders including local government and the private sector e.g. transport companies potentially interested in adding electric waterbuses to their fleet. The demonstration of the solution aims to demonstrate that:

- the electric waterbus is an efficient form of transport for city dwellers.
- the waterbus can attract sufficient customers to represent a good investment.
- the technology (battery, motor and waterbus) works effectively.

Performance of the motor, the battery and the waterbus business model will be tested. The implementation process, lessons, achievements, and challenges will be documented. The findings will be shared with appropriate stakeholders, including local authorities and potential customers. If the innovation is deemed to be appropriate for scaling and commercialization, then the Project will support this through a separate process.

ANTICIPATED ACTIVITIES

The selected offeror is expected to carry out the following activities:

- Through research and discussion with DOIT, develop a list of potential demonstration sites/ transport routes (minimum of three) in HCMC.
- Based on the proposed list, select one demonstration site/ route in HCMC where the solution will be demonstrated, and agree terms and conditions with the site owners e.g. port authority.
- Develop a technical proposal that includes an executive summary, a need statement, i.e. what is the issue being addressed and why it matters, activities, methodology and expected outcomes i.e. financial (IRR, NPV over 5 years), energy savings, emissions reductions; evaluation plan; and budget.
- Provide the electric waterbus, with specifications outlined above. Electric waterbus converted or re-manufactured from diesel/fossil fueled waterbus are also eligible for this scope of work.
- Advertise the route to potential customers.
- Collect data, monitor and report against a set of key performance indicators e.g. related to income and costs, emissions saved, performance of the battery, motor and the boat etc. The indicators will be agreed with the Project and will be reflected in a Monitoring & Evaluation plan.
- Document lessons and results, including successes and challenges. Support the Project's independent MEL firm³ and share information with the Project to document the implementation process, lessons, achievements, and challenges. Prepare progress and final reports.
- Support the Project to share the findings of the demonstration with relevant stakeholders e.g. by featuring in promotional materials and attending a limited number of workshops and exchange visits. Stakeholders at workshops are likely to include USAID, GVN, DOT and DOITs, and potential customers of the technology from HCMC and Danang.
- On an as-needed basis, provide inputs to the preparation of communications materials developed by the Project team, and organize site visits for high-level stakeholders and at the request of the Project.

³ I) an independent Monitoring, Evaluation and Learning service provider

TARGET BENEFICIARIES

The demonstration aims to benefit the following stakeholders:

- Department of Transport – mandated with promoting and finding alternative, clean transport options for citizens.
- Department of Industry and Trade – mandated with reducing city emissions.
- Companies e.g. existing passenger boat service providers, potentially interested in adding electric waterbuses to their fleet.
- Department of Science and Technology in HCMC – mandated with promoting scientific and technological development in Ho Chi Minh City.
- City dwellers looking for affordable, environmentally friendly transport options.

EXPECTED TIMELINE AND DELIVERABLES

Implementation is expected to start in May 2023, for a maximum period of up to nine (9) months subject to the Project extension by USAID. The offeror should propose a timeline and sequence of activities that aligns with their proposed technical approach. Deliverables will include:

- A report documenting the results/ analysis of survey findings related to identification of potential demonstration sites/ routes.
- A technical proposal that includes an executive summary, a need statement, i.e. what is the issue being addressed and why it matters, activities, methodology and expected outcomes i.e. financial (IRR, NPV over 5 years), energy savings, emissions reductions; evaluation plan; and budget.
- A clear agreement detailing the terms and conditions with the site owner of the demonstration site (including but not limited to a description of the demonstration, the demonstration activities with tentative implementation timeline).
- A report on technical design and operations of waterbus provided in this demonstration.
- Bi-monthly progress narrative and financial progress reports as per an agreed template (*number and timing of reports to be agreed with the Project*).
- A completion report documenting activities, successes, lessons as per an agreed template.
- Guideline/ manual (in English and Vietnamese) for suppliers (and their agents) to promote and scale the technology in the future. This manual will detail the steps involved, the challenges and ways to resolve these challenges (based on experience with the demonstration).

All documents will be in English except for the guideline/manual which will be in both English and Vietnamese. If the agreement with the owners (and city authority, if any) of the demonstration site is in Vietnamese, the main body of the agreement must be translated into English.