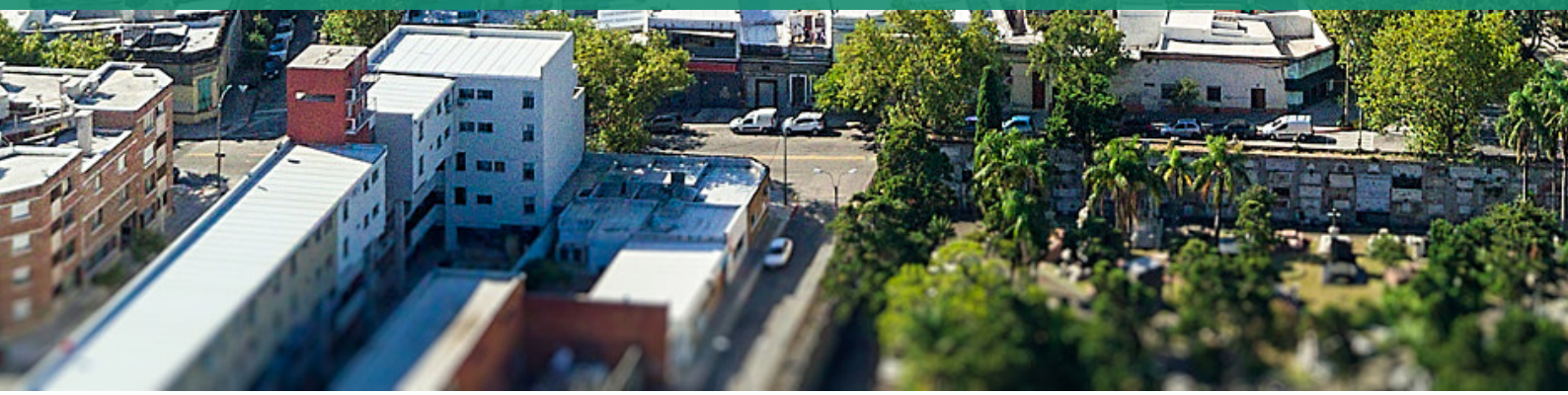
Montevideo, Uruguay

SOLUTIONSPLUS I LIVING LABS UPDATE



This project has received funding from the European Union Horizon 2020 research and innovation Programme under grant agreement no. 875041

PROJECT PARTNERS

ABOUT

This is a summary of the paper, submitted to the journal 'Sustainable Earth Review' developed under SOLUTIONSplus project. Currently the paper is under peer review.

TITLE

Capacity and market potential for local production and distribution of electric two-wheelers in Southeast Asia, focused on Thailand, Indonesia, and Vietnam

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FINANCIAL SUPPORT

Solutionsplus

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LAYOUT

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PICTURES

All the pictures are provided by the ITDP

June, 2024

MONTEVIDEO, URUGUAY

The SolutionsPlus project aimed to accelerate the transition to sustainable urban mobility through innovative and integrated e-mobility solutions. To this end, the consortium partners created Living Labs at city level to test different types of innovative and integrated e-mobility solutions. Living Labs reach beyond the implementation of technological innovations and also include elements of information, inspiration and initiation to achieve a stronger and sustainable impact of the project activities.

INFORM

Boost capabilities of local and national authorities, public transport operators and entrepreneurs about innovative urban e-mobility solutions across various transport modes by **informing them about tools** to plan, assess, implement and operate e-mobility solutions.

INSPIRE

Foster the take-up of e-mobility innovations by businesses, start-ups, local and national governments and transport operators by **inspiring** officials, operators, industry and businesses through peer-to-peer exchange on innovative e-mobility products and services.

INITIATE

Strengthen policy and business **collaboration** by **initiating** partnerships between local and national governments and local and European entrepreneurs and supporting the development of new e-mobility models business implementation plans.

IMPLEMENT

Create reference models for e-mobility innovation by **implementing** demonstration actions to test innovative e-mobility technologies and services, foster their **replication** and ensure their long-term **sustainability**.

IMPACT

Contribute to global **sustainability and climate goals** by boosting the **impact** of this project through the integration of the innovative concepts into policy, funding, operation, research and business practice.

Montevideo, the capital city of Uruguay, has a population of 1.3 million, more than 30% of the country's population. Uruguay's GDP per capita is US$20,795 (2022), which is the highest in the region. In 2020, its per capita CO2 emissions were 1.9 tonnes.

Public transportation in Montevideo primarily relies on buses, with additional services provided by taxis and various minor systems within the city. Based on the recent reforms public transportation was integrated into a unified system comprised of 1528 buses operated by four private companies[1]. The city centre serves as a central hub for this network, with a big number of lines crossing this area. In 2019, taxis were incorporated into the STM system (integrated Metropolitan Transportation system). Passengers can use the STM smart card to pay for rides across various transportation modes. This contactless payment method, tied to the cardholder's identity, includes the public bicycle

[1] Hipogrosso, S., & Nesmachnow, S. (2020). Analysis of sustainable public transportation and mobility recommendations for Montevideo and Parque Rodó neighborhood. Smart Cities, 3(2), 479-510.

system. A strong emphasis is currently put on electrification of the local fleet of buses and based on Uruguay's structural transformation of its electricity system, with more than 94% of the electricity generated now coming from renewable sources in average the last 10 years.

DEMONSTRATION ACTION IN MONTEVIDEO

The activities in the city of Montevideo include two demo components: 1) Charging hub in the city center (Quijano street), which involves charging options for light electric vehicles, and 2) Local design and assembly of LEV for urban logistics. The charging point in the city center integrates efficient and cost-effective smart charging solutions for electric bikes, electric motorcycles and L-categorized light electric vehicles, such as the ones manufactured in the context of the second component.

INFORM

Tools and different types of knowledge products on low-carbon urban logistics, cycle logistics, light electric vehicles (LEV), charging infrastructure, batteries and e-buses were incorporated in the SOLUTIONSplus online toolbox and shared with the city, addressing the knowledge gaps identified during the project.

On July 6th, 2022, SOLUTIONSplus and the Julio Ricaldoni Foundation (FJR), one of the local partners of the project, hosted an event to present the progress towards implementation of the two components of SOLUTIONSplus in Uruguay and to launch the LEV prototypes locally produced by 3 Uruguayan companies. The presentation was followed by a workshop with the national and local authorities to discuss the actions needed to scale-up the previously implemented initiatives related to e-mobility. On July 7th, 2022, the SOLUTIONSplus delegation that was on the ground (FIER, WI, UEMI) joined the Municipality (IM) and the Public Utility Company (UTE) teams in the city for a site visit that was followed by a working session in the IM to discuss the details and next steps of the implementation.

INSPIRE

A total of **four modules** were conducted in the Regional Training Programs of 2021 and 2022, addressing the gaps identified in the Technical Needs Assessment carried out in 2020. i.e., 1) low-carbon urban logistics, 2) LEV regulations, 3) charging infrastructure, and 4) e-buses. Montevideo not only benefited from the content presented but was also able to share initiatives that public and private actors are pushing forward in the city (e.g.: the charging infrastructure network and business models for e-mobility).

Between July 2nd and 8th, 2022, a SOLUTIONSplus delegation (WI, FIER and UEMI) joined the local team and held a **series of meetings and workshops**, where topics such as e-buses, charging infrastructure and multimodal charging were discussed with members of national and local entities, as well as with private stakeholders. Additionally, Montevideo benefited from its participation in other SOLUTIONSplus capacity building activities, including virtual and on-site peer-to-peer exchanges, site visits, expert advisory boards and international conferences related to e-bike sharing systems, low- carbon urban logistics, last-mile connectivity and e-buses.

INITIATE

In Montevideo, the start-ups **CargoBikeUY** (5 e-cargo bikes), **Wheele** (3 e-cargo bikes) and **GreenStar** (2 e-tricycles and 2 e-quadricycles) **received seed funding** for the local design and assembly of different types of LEV, mainly for logistics. Green- Star received 2 Valeo drivetrains in a kit to be easily integrated in the e-quadricycles. In addition, PEM Motion, one of the companies selected in the 1st EU Innovators Call supported CargoBikeUY and GreenStar in the vehicle design. The **8 e-cargo bikes and 2 e-tricycles are finalised**, pending only the 2 e-quadricycles, one of which was already successfully pre-tested. The second EU Innovators Call will focus on supporting the consolidation of Montevideo's charging ecosystem and the retrofitting of utility vehicles. Finally, SOLUTIONSplus supported the city with the elaboration of a **pre-feasibility study** for the electrification of 1 bus line connected to the Ciudadela Terminal.

IMPLEMENT

Component 1: Multimodal charging hub in the city center

The originally planned charging infrastructure for the Ciudadela Terminal involved the construction of a high-capacity bus depot for overnight and opportunity charging, complying with Combined Charging Standard (CCS2) and Open Charge Point Protocol (OCPP). However, component 1 turned into the construction of bike line infrastructure and a charging hub for light electric vehicles in Quijano street corner 18 de Julio, the main avenue of the city. The new scope of the 1st component was integrated into the development of a series of low-carbon mobility actions the Municipality had, allocating the charging hub in a strategic point in the city.

Component 2: Urban logistics

Demonstration Component 2 involved the manufacturing and testing of LEFs (light electric freight vehicles) in an urban logistics pilot. Three local start-ups were selected for the LEF manufacturing: CargoBikeUY, Wheele and GreenStar. Eight bikes and two e-tricycles were finished (Figure 6). The vehicle design was supported via the EU Innovators Call. Also, the BMS selection and vehicle performance testing were supported.

In the urban logistics pilot, two electric cargo bikes (a bicycle and tricycle) were tested. The duration of the pilot was 2 weeks (December 14-23, 2022). PedidosYA (Delivery Hero) was the logistics operator, and the operating model of the pilot involved direct deliveries from origin to destination (local businesses to customers). Driving training was provided for the e-cargo bike riders prior to commencing the pilot.

During the pilot, a total of 156 trips (26/day on average) were made, covering a total of 187 km (31 km/day on average). A total of 90 packages (15/day on average) were delivered, with a total mass of 135 kg (23 kg/day on average).

IMPACT

The SOLUTIONSplus project in Uruguay is focusing its efforts on **building a strong collaboration between local and European companies** with the aim of consolidating the charging ecosystem needed for the scale-up of e-mobility in the country. Another important aspect in which the project has been in discussions with the local stakeholders is in the set-up of a **national capacity building program on e-mobility for all education levels**, which is in line with the Technical and Vocational Education and Training (TVET) Fund in Latin America that will focus on the energy transition in Uruguay. These aspects are reflected in the City Roadmap for Montevideo and will be presented in the scale-up concept. Based on the assumption that the SolutionsPlus vehicles replaced ICE 2-wheelers (0.04 kg CO2/km), the deployment of two e-cargo bikes during the pilot for a total distance of 187 km decreased CO2 emissions by 7.48 kg. The yearly extrapolated CO2 savings per vehicle, considering the distance of 16,992 km is 670 kg. Due to the short demonstration period, the small number of vehicles and very conservative assumption regarding the average daily mileage of vehicles, more **substantial savings can be expected from an upscaled approach.**

REPLICABILITY

The light electric vehicles developed and tested are suitable for use in cities around the world, especially in districts with narrow streets, streets that are prone to traffic congestion, and in cities that have access restrictions and traffic calming measures in place. The significant efficiency gains experienced in all operating schemes and the adaptability of the vehicles to different use cases reveal a high scale-up and replication potential.

PedidosYA riders in the CargoBike.UY and Wheele e-cargo bikes

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