

D3.1 Catalogue of E-mobility Solutions

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1. Introduction

This deliverable collects and categorises key concepts and business options related to available e-mobility solutions, the result is a searchable database and an illustrated catalogue accessible online (D3.1). Both the database and the catalogue inform on the available e-mobility concepts for implementation in the partner cities (and other cities). The catalogue will seek inputs and be distributed to the industry partners (also beyond the consortium). The concepts and business options will include products/services of European industry players that are feasible for implementation in the partner cities/countries. The catalogue is a part of the SOLUTIONSplus showcase of e-mobility solutions complementing the SOLUTIONSplus Toolbox. The catalogue will be accessible online in an interactive and user-friendly design, and the partners will be able to easily update the information at regular intervals. References to the experience from other cities and places, which have implemented the options, will be made on online catalogue. The catalogue will be open for all e-mobility providers (also beyond the consortium) and will feature both passenger and freight solutions, charging technologies, vehicle type and services that are available for e-mobility implementation.

2. SOLUTIONSplus Catalogue of E-mobility Solutions

The SOLUTIONSplus Catalogue of E-mobility Solutions consists of a collection of factsheets on e-mobility solutions under the three thematic areas of innovation under the project (Vehicle, Operations, Integration). The factsheets are developed by SOLUTIONSplus partners who are contributing within their respective areas of expertise. The catalogue also compiles existing factsheets from other sister projects which were or are being implemented by some SOLUTIONSplus partners such as UEMI. The catalogue focuses on the following areas of e-mobility innovations as depicted in the figure below:

Figure1: SOLUTIONSplus Innovation Focus Areas

Vehicle and charging technology
Innovative e-mobility products and services; Interoperability of e-mobility solutions modes and systems across different vehicle types, including charging, servicing and operations; New and improved industry and local business partnerships working on e-mobility products and services.
Business models and operations
Cooperation between EU industries and regional small and medium-sized business on innovative urban e-mobility solutions, including concepts for charging, first- / last-mile mobility & delivery, integration or logistics and sharing systems, multi-modal / multi-purpose journeys, coordinated mobility management, demand-responsive services
Integration, policy and planning
Operational and conceptual integration of all types of e-mobility; Policies at the local and national level to enable the adoption and financing of innovative urban e-mobility solutions as part of a comprehensive urban mobility framework.

2.1 SOLUTIONSplus Factsheets

2.1.1 Factsheet categories

The factsheets are organized under the following thematic clusters and cross-cutting areas:

- ❖ Thematic clusters:
 - Vehicles
 - Operations
 - Integration
- ❖ Cross-cutting areas:
 - Business modelling and planning
 - Policy integration and finance
 - E-Mobility4All

The thematic cluster on *Vehicles* covers topics related to the following: Electric 2- and 3-wheelers, Electric buses, e-BRT, mini-buses, taxis, Retro-fitting Electric (mini)-buses and other Related Vehicles, Business Models, Capacity Building, Policy. The *Operations* cluster covers topics on: Innovative charging solutions of high-capacity bus-systems, Use of existing systems and grids for the charging of electric vehicles, Seamless Charging, Smart charging and charging services and Related Operations, Business Models, Capacity Building, Policy. Also, the cluster on Integration borders topics on: Mobility as a Service, Eco-routing, Network Planning and Management, Fleet Bundling. Inner city & last Mile E-delivery shared services and Related Integrative Measures, Business Models, Capacity Building, Policy.

2.1.2 Process of developing the Factsheets

In developing the factsheets, a template (see in figure below) was developed together by all WP3 partners and shared among the whole consortium. The template served as a guide for structuring the content of the factsheet. The factsheets essentially provide a general overview of e-mobility solutions and measures including examples, potential benefits, technical and financial considerations, policy and legislative measures, institutional issues, as well as transferability and replicability of measures. The factsheets also share experiences from case studies across various regions engaged in the SOLUTIONSplus project. The case studies bring to light several e-mobility solutions being implemented by cities and describe specific actions and approaches deployed and their intended benefits and achievements made in the respective cities. Potential business opportunities embedded in the implemented measures are also highlighted making links to possible prospects that exist for EU and local actors to get involved in developing e-mobility innovations.

Figure2: Factsheet Template



SOLUTIONSplus Factsheet Template
WP3.1 Catalogue of E-mobility Solutions

- Vehicles
- Operations
- Integration

Factsheet for <Measure X Toolkit>

Short summary of individual, specific e-mobility measures or projects

In brief <i>A general introduction to the measure and how it can positively contribute to urban mobility</i>
Examples <i>Examples of the different elements that are contained in the measure</i>
Results <i>What positive effects could citizens experience as a result?</i>
Technical and financial considerations <i>Summary of specific technical and financial considerations cities must take before embarking on implementing the solution</i>
Policy/legislation <i>What are the ideal policies/legislative frameworks for the implementation of this measure?</i>
Institutions <i>A short description on who to target with such a measure and what support they would need from other institutions</i>
Transferability, replicability <i>Is this replicable in other cities, regions, businesses? What are the conditions for replicating this solution?</i>

Case study: City X

Image
Context <i>A brief background of the city and related to the measure</i>
In action <i>Describe the approach and actions the city took to implement the measure. Concrete facts and figures (budget, etc) should be included.</i>
Results <i>Summarises the results achieved by the action. As far as possible, achievements should be quantified, and the benefits obtained should be highlighted clearly.</i>

Business opportunities

Context <i>A brief background to the potential business opportunities from the EU and regional perspective</i>
EU and local actors <i>Short summary on some of the business actors in this field.</i>
Products <i>Short description of the products that are available or being developed (or could be developed).</i>

References

The table below presents the factsheets being developed. It must be mentioned that there will be regular updates to the catalogue and its content whenever necessary throughout the project.

Table1: SOLUTIONSPPLUS Newly Developed Factsheets

Pillars	SOLUTIONSPPLUS Intended Factsheet Module Topics	SOLUTIONSPPLUS expected Contributing Partners	Factsheets developed as at September 2020	Lead authors
<i>Thematic clusters</i>				
Vehicles	Electric 2- and 3-wheelers:	UNEP, Valeo, WI, CAA	Electric 2-wheelers	FIER
	Electric buses, e-BRT, e-trucks, mini-buses	Volvo		
	E-scooters (e kick scooters)	WI	E-scooter Sharing (Trottinettes)	WI
	Bike Sharing Systems	UEMI	Bike Sharing Systems: Case Study - BiciMon (Montevideo)	UEMI
	In-motion charging of battery-electric trolleybuses	Rupprecht, UITP	In-motion charging of battery-electric trolleybuses	Rupprecht
	Vehicle conversion		Electric Vehicle Conversion	UEMI
	Innovative charging solutions of high-capacity bus-systems	ABB		
	Operations	Use of existing systems and (public transport) grids for the charging of electric vehicles	Rupprecht, T-Systems, Dynniq	
			Re-usage of Telecommunications Infrastructure for Charging Points	UEMI
Volvo, Dynniq, Rupprecht				
Seamless charging and shared charging			Effiza EV Chargers	UEMI
			E-mobility Solutions – Hot Spot Charging network	UEMI
Freight and e-logistics		ZLC, FIER		
Batteries		Recycling plant for waste battery treatment	UEMI	
Integration	Mobility as a Service	PLUS, ERTICO, V2C2, UN-Habitat	MaaS guidelines	PluService

	Integrated Public Transport Network Planning,	UITP, UN-Habitat		
	Eco-driving and eco-routing in public transport, use of GDAS	Rupprecht Consult, T-Systems, ERTICO	Eco-routing in public transport	Virtual Vehicle, Pluservice, T-Systems
	Grid integration	Dynniq	Low Carbon Mobility Management (LCMM)	T-Systems
	C-ITS Mobility Services C-ITS Mobility Services C-ITS Mobility Services	IDIADA	C-ITS, Mobility Services	IDIADA
Cross-cutting issues				
Business modelling and planning	Developing e-mobility business models	VTT		
	Planning and implementation of e-mobility business models	ERTICO		
	Start-up Incubation for e-mobility deployment	UN-Habitat, ERTICO		
			E-mobility in East Africa – Two wheelers and e-matatu in Kisumu, Kenya	UNH
			E-mobility in East Africa – Motorcycle electrification in Nairobi, Kenya	UEMI
	Costs and benefits of E-Mobility	VTT, TNO		
	User group-based charging infrastructure planning	Rupprecht		
	Air quality and e-mobility	CAA	Adopting electric mobility solutions for air quality improvement	CAA
	Partnerships and cooperation opportunities	UEMI		

Policy integration and finance	E-Mobility integration in SUMP	Rupprecht Consult, CODATU		
	National Urban Mobility Planning	WI		
		TUB	Integrated Urban Development (Housing densification and transport planning)	TUB
	Local policies to support e-mobility	UN-Habitat		
	National e-mobility policies and support measures	UN-Habitat		
E-Mobility4AI	Inclusion, affordability and public acceptance of e-mobility solutions	UN-Habitat,		
	E-Mobility & gender	VTT, UITP		
	Stakeholder participation in e-mobility development	Rupprecht Consult, CODATU		
	Incentive schemes for e-mobility development	WI		

As mentioned above, the SOLUTIONSplus catalogue also draws on existing factsheets from sister projects. The table below presents existing factsheets from the UEMI Toolkit on e-mobility which will be included in the catalogue.

3. SOLUTIONSplus Catalogue of E-mobility Solutions – Link with other project activities

The SOLUTIONSplus catalogue is intended to serve as a starting basis for a number of project products and deliverables, in particular training material (WP2) and business plans (WP3). The SOLUTIONSplus Toolbox is the key repository of the project spanning across all the all work packages, providing: Impact assessment tools (WP1), Capacity building material (WP2), Summaries of business plans and models (WP3), Summaries of e-mobility innovations tested in

the demonstration actions (WP4), Design, operations and management tools for different e-mobility solutions (WP4), information financing institutions and funding options (WP5). The catalogue will provide useful information and knowledge on e-mobility solutions and will be made publicly available (online) for transport stakeholders.

The e-mobility solutions in the catalogue will reflect mainstream options already developed by EU industry partners as well as those being developed in other regions of the globe. These mainstream options can be adapted to the partner city needs through the demonstration actions in WP4. Integration of (new and existing) e-mobility solutions will be the core of each of the demonstrations tested in the partner cities. The integration of several e mobility solutions, charging and service solutions will be highly innovative for the partner cities in Asia, Africa and Latin America; and European partner cities will be able to share their substantial expertise in this area, but also adopt new approaches. The online catalogue will also provide the platform to share potential demand for e-mobility options with SMEs both locally and within the EU industry. Updates and results achieved from demonstration actions and replication activities as planned under WP5 will also be included in the catalogue. The e-mobility solutions contained in the catalogue will also serve as reference documents to be used in the capacity building activities in WP2.

The overall technical and conceptual structure of the toolbox is being refined at the moment. The catalogue of measures, which provides an introduction to all key thematic areas. This will go online through the SOLUTIONSplus toolbox in October 2020.

Table2: Existing Factsheets from UEMI Toolkit mapped with related SOLUTIONSPLUS Topics

EXISTING UEMI FACTSHEETS BY TOPIC AREA		RELATED SOLUTIONSPLUS TOPIC																								
Topic Area	Available Factsheets	VEHICLES							OPERATIONS/CHARGING INFRASTRUCTURE							INTEGRATION										
		Electric 2- and 3-wheelers	Electric buses, e-BRT, mini-buses, taxis	Retro-fitting Electric (mini)-buses	Other Related Vehicles	Business Models	Capacity Building	Policy	Innovative charging solutions of high-capacity bus systems	Use of existing systems and grids for the charging of	Seamless Charging	Smart charging and charging services	Other Related Operations	Business Models	Capacity Building	Policy	Mobility as a Service	Eco-routing	Network Planning and Management	Fleet Bundling	Inner city & last Mile E-delivery shared services	Other Related Integrative Measures	Business Models	Capacity Building	Policy	
Electric Mobility	Factsheet: Electric Handcarts (Elo Carts) - Case Study: Nairobi																									
	Factsheet: Electric Three-Wheelers																									
	Factsheet: Battery technologies - Contemporary Issues																									
	Factsheet: Electric Two-Wheelers - Case Study: Shanghai (China)																									
	Factsheet: Electric vehicles in municipal fleets - Rotterdam's municipal EV fleet																									
	Factsheet: Electric Urban Delivery Truck - Case Study: New York City																									

	Factsheet: Infrastructure for Clean Vehicles - Case Study: Developing EV charging infrastructure																											
	Factsheet: Electric Taxis - Case Study: Singapore's Electric Taxis																											
	Factsheet: E-Scooters - Case Study: San Francisco																											
	Factsheet: Electric Moped Sharing - Case Study: France, Paris																											
	Factsheet: Electric Bus Rapit Transit - Case Study: Shenzhen, China																											
	Factsheet: Promoting Electric Vehicles - Case Study: Promoting EV's in Barcelona																											
Public Transport	Factsheet: Public Participation in Urban Transport - Case study: Participatory budget-funded bicycle infrastructure in Seville, Spain																											
	Factsheet: Bus Rapid Transit System - Case study: Bogota's Transmilenio BRT system																											

Factsheet: Trolleybus Systems - Case study: Castellón and the region of Valencia (Spain)																								
Factsheet: Electric and Hybrid Public Transport - Case study: Hangzhou (China)																								
Factsheet: Integrated Public Transport Network Planning - Case study: Montpellier (France)																								
Factsheet: Intelligent Transport System - Case study: Monza's Traffic Priority System (Italy)																								
Factsheet: Bus priority measures - Case study: Brisbane Busway (Australia)																								
Factsheet: Integrated Fare Systems - Case study: London's Oyster card (UK)																								
Factsheet: Bike sharing and public system - Case study: Mexico city's Bicycle-sharing system																								
Factsheet: Metro System - Case study: Singapore's MRT																								
Factsheet: Tram Systems - Case study:																								

	Croydon's Tram system (United Kingdom)																								
Transport infrastructure	Factsheet: Transit Oriented Development (TOD) - Case Study: Curitiba																								
	Factsheet: Modal Interchanges - Case study: The Plaza Elíptica in Madrid (Spain)																								
	Factsheet: Dedicated Bus Lanes - Case Study: Warsaw's bus priority Lane (Poland)																								
	Factsheet: Innovative, safe cycling infrastructure - Case study: Hradec Králové's innovative bike tower (Czech Republic)																								
	Factsheet: Improving non-motorised transport - Case Study: Helsinki's pedestrian and cyclist Pathways (FINLAND)																								
	Factsheet: Pedestrian Infrastructure - Case study: Reducing heavy traffic in Lužice (Czech Republic)																								
	Factsheet: Pedestrianising City Centres and Streets - Case study: Istanbul (Turkey)																								

	number plate auctions - Case Study: Restricting car ownership in Beijing and Shanghai (China)																									
	Factsheet: Fuel economy standards - Case Study: Chile's policy on fuel efficiency																									

