29-30 Οκτώβριος 2026 | Συνεδριακό Κέντρο Φιλοξενία
Λευκωσία, Κύπρος

8ο Συνέδριο
Βιώσιμης Κινητικότητας
και Ευφυών Συστημάτων
Μεταφορών

Cost-effective Charging of Electric Vehicles without Stressing the Power Grid:

The ePowerMove Approach

ePower Move

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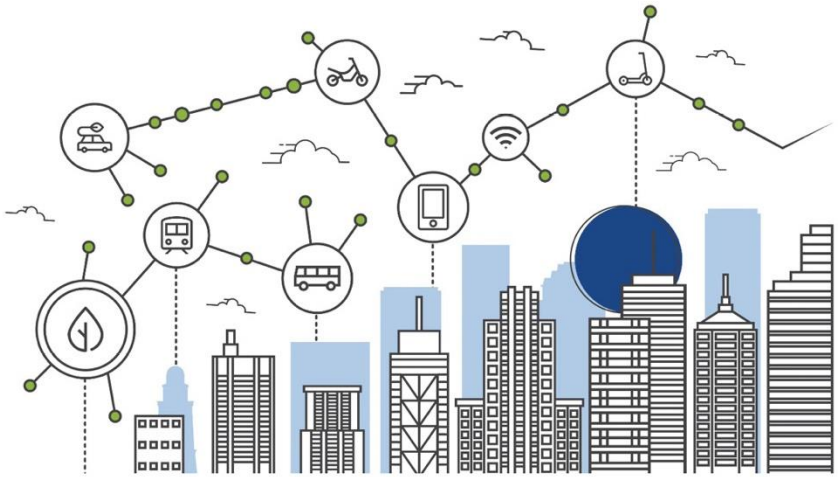


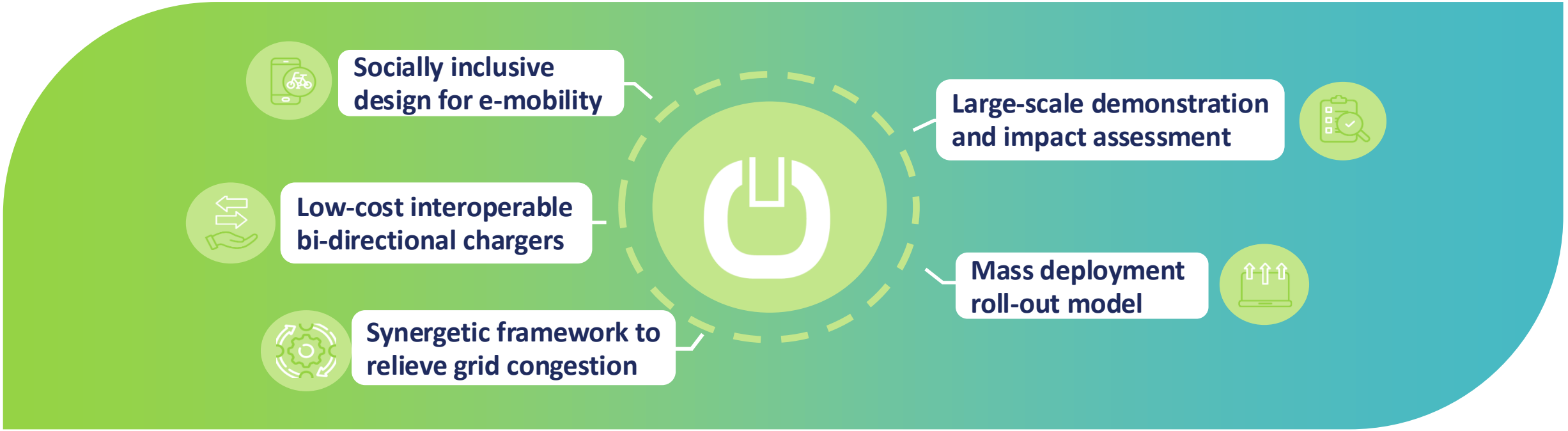
Το Συνέδριο υλοποιείται στο πλαίσιο του Προγράμματος Πολιτικής Συνοχής «ΘΑΛΕΙΑ 2021-2027» με τη συγχρηματοδότηση της ΕΕ.

Με τη συγχρηματοδότηση της Ευρωπαϊκής Ένωσης

ΤΜΗΜΑ ΔΗΜΟΣΙΩΝ ΕΡΓΩΝ

ePowerMove at a Glance

- **Goal:** Low-cost, people-friendly & grid-friendly bidirectional slow charging for mass EV adoption



42 months
January 2025 – June 2028

18 partners
7 countries

€9.46M
€8M EU funding

3 pilots
Helsinki, Klagenfurt, Nicosia

ePowerMove at a Glance

- **One common roadmap & three pilot demonstrations**

We are here

2025	2026	2027	2028
Co-design	**Develop & test**	**Pilots live**	**Scale up**
Users and requirements; System architecture	Low-cost chargers; App & smart controllers; Lab tests	Helsinki; Klagenfurt; Nicosia	Impact; Digital twin; Roll-out

Helsinki
Finland

Urban car park; 40 new smart charging points; Nordic climate.

Klagenfurt
Austria

City center next to bus/rail hubs; V2G with EV-sharing fleets.

Our pilot

Nicosia
Cyprus

UCY campus; Bidirectional charging with PV & storage to relieve the grid.

ePowerMove at a Glance

- **Two main focus areas of the project**

1 Less intrusive chargers with V2G



Compact design
fits on-street spaces

2 × 22 kW outputs
slow, low-cost charging

Bidirectional (V2G)
ISO 15118-20 in development

People-friendly app
for charging and V2G settings

Our Main Focus

2 Synergetic framework

Manages EV charging, V2G, solar PV and batteries together with the grid

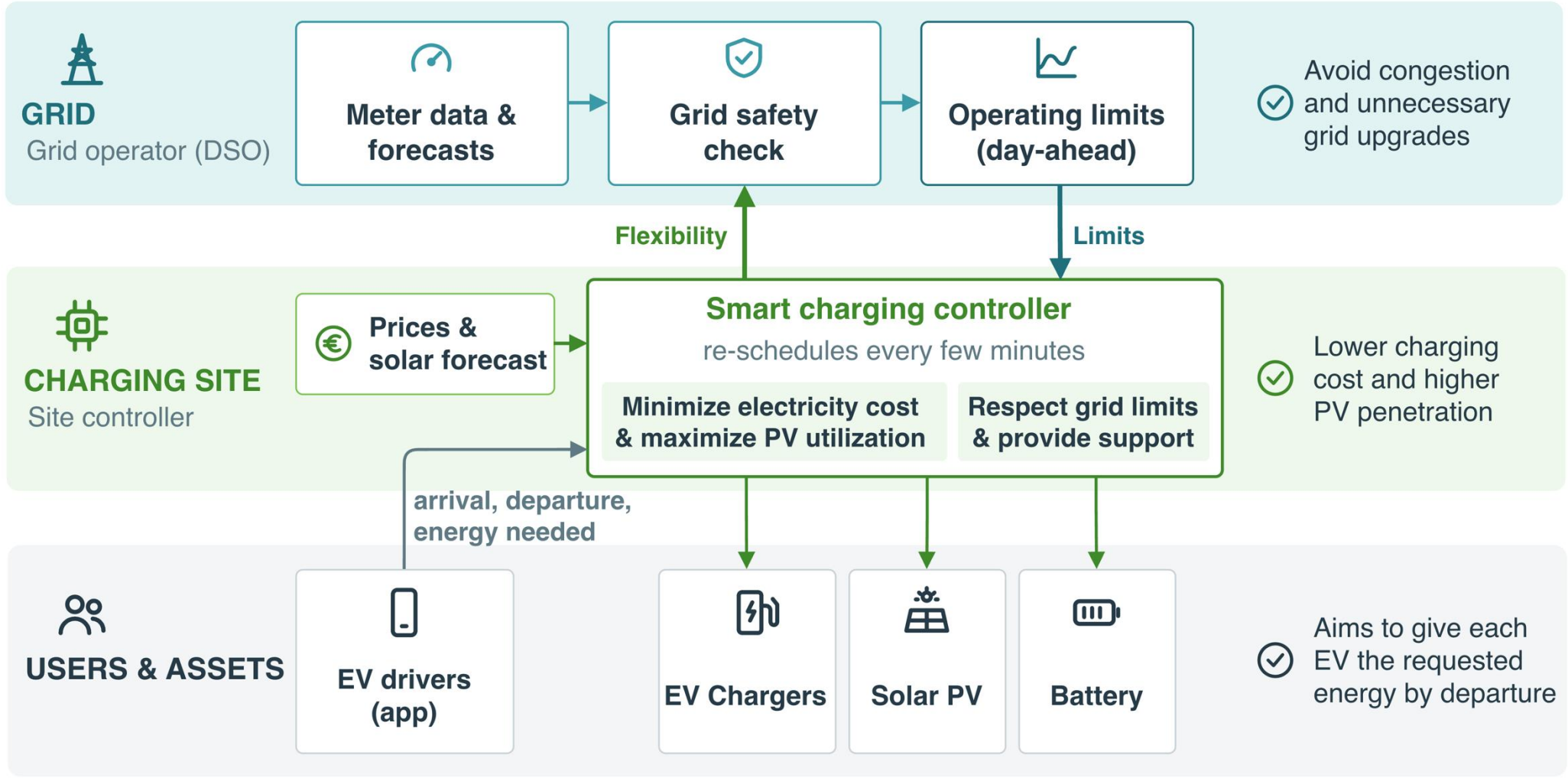
More renewable energy
charge when local solar is available

Lower charging cost
shift charging to cheaper hours

Grid limits respected
no congestion, no unnecessary upgrades

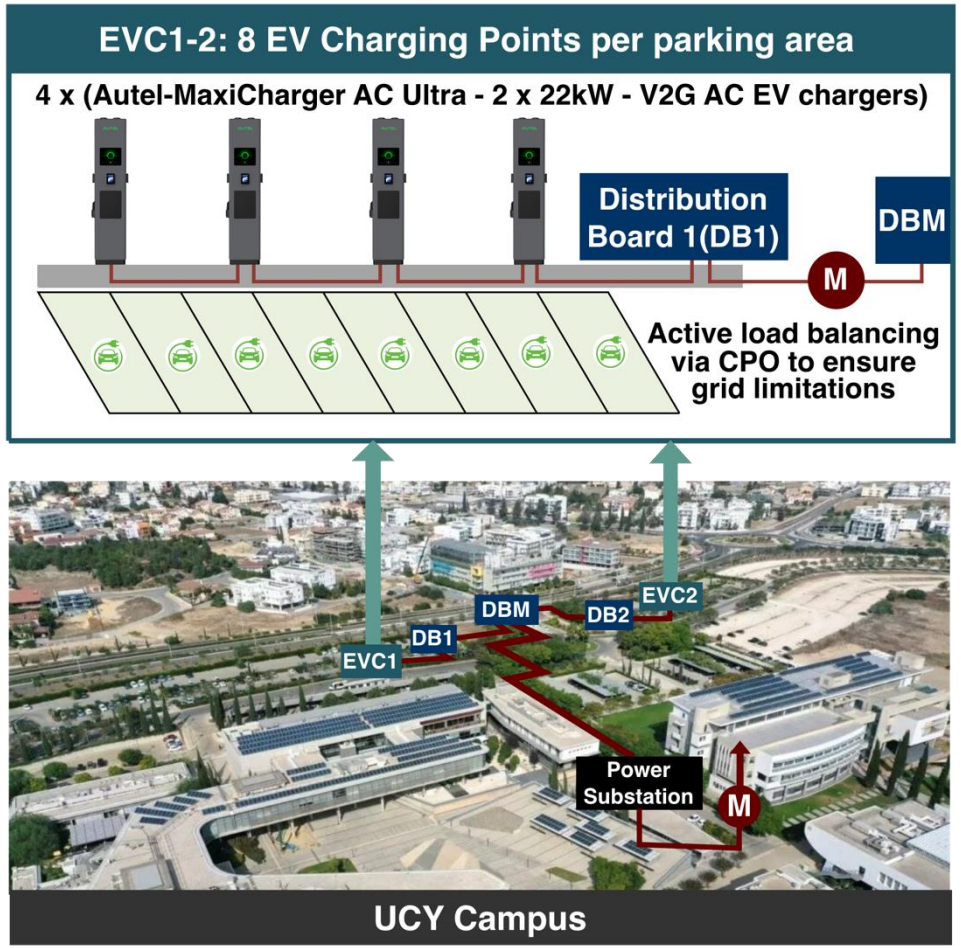
Key Development and Testing

- **Design of a multi-level synergetic framework:** Grid and Charing Site managed together



Key Development and Testing

- **Nicosia Pilot:** Preparation of the infrastructure for installing 8 V2G chargers (2 x 22 kW each) integrated with local energy resources at campus and building level (by November 2026)



CAMPUS LEVEL
University of Cyprus

5 MW	2.5 MWh	Load
Solar PV	Battery	Smart meters

Sets the energy cost (€/kWh) and the total power limit

€/kWh + power limit

LEVENTIS BUILDING LEVEL
Building + charging energy management

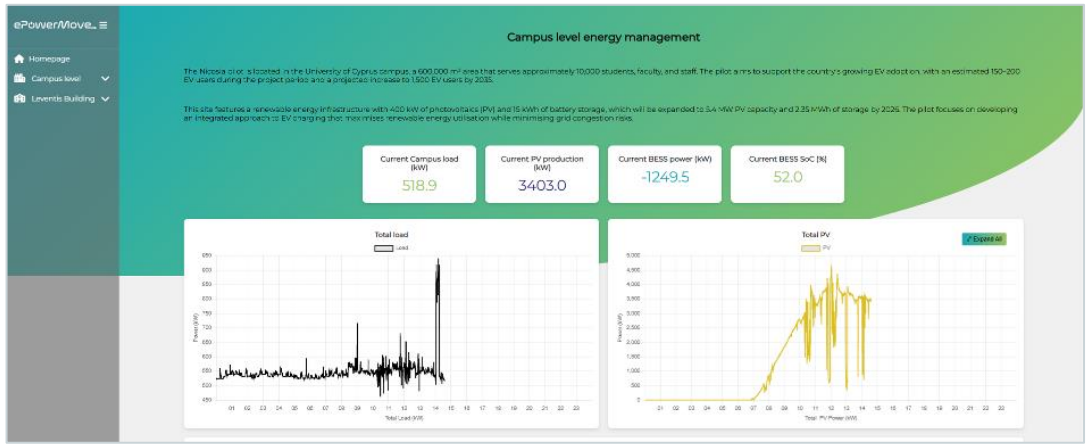
70 kW	15 kWh	Load
Rooftop PV	Battery	Smart meters

EVC1	EVC2
8 V2G charging points	8 V2G charging points

Minimize cost, serve multiple EVs, respect local grid limits

Key Development and Testing

- **Software platform:** Initial development and deployment for monitor, forecast, and energy management of EV chargers and campus building



Campus & Building level Energy Monitoring



PV forecasting & Load demand forecasting

Monitor

Live campus & building level load, PV, and battery system operation

Forecast

Day-ahead PV forecastsing,
Day-ahead load forecasting

Manage

Leventis building & EV chargers energy management and control

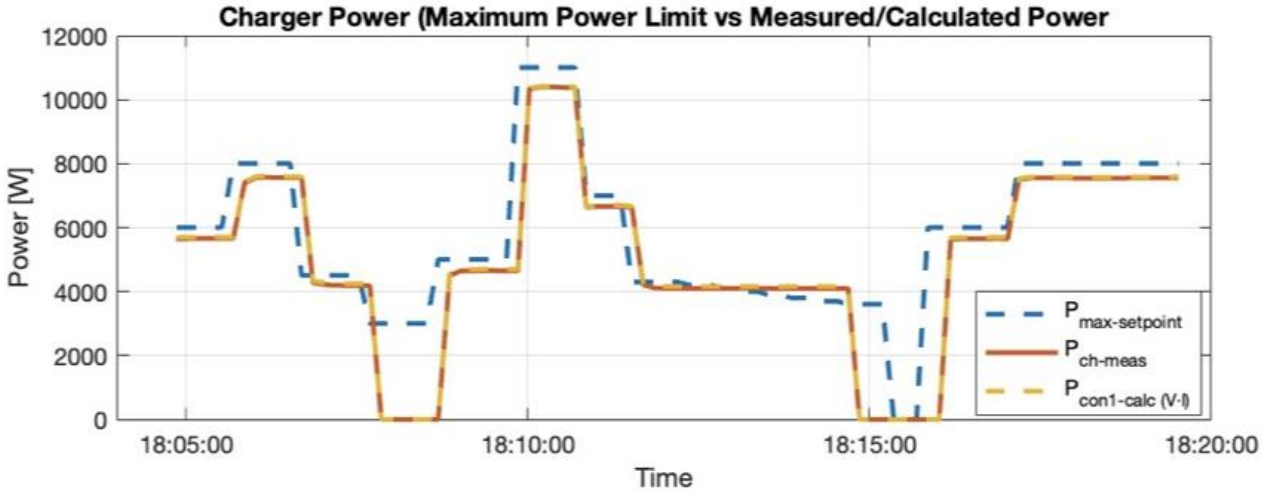
Key Development and Testing

- **Charging control:** Initial tests with the pilot charger (Autel AC Ultra) for enabling dynamic and real-time charging rate control functionalities



Autel AC Ultra (2 × 22 kW) at a test site

Measured charging power follows the set-point sent by our controller



Controllable

Charging power set in real time via Modbus & OCPP

10–20 s

Dynamic response to a new power limit set-point

Initial Results

- **Smart charging:** Simulation of a site with 4 chargers & Real-life test in a building with 1 charge

Simulation: charging site

4 chargers; PV + battery; V2G; 24 h

–65 % **PV-BSS-EV:** up to 65% lower cost (vs. charging without PV and BSS)

–24 % **V2G:** extra cost reduction of 24% with V2G on a busy site

[1] A. Kasis, H. Hnatova, and M. Ruhhütl, “Grid and charging/prosumer level management solutions,” ePowerMove project, Horizon Europe Grant Agreement No. 101192753, Deliverable D3.2, v1.0, Sep. 2026.

Real-life test: house in Nicosia

4 weeks; 5 kW PV + 7.5 kWh battery; 11 kW EV

- 29 % **PV-BSS-EV:** 29% lower cost (vs. charging on arrival & self-consumption mode)

- 25 % **PV-EV:** up to 25% lower cost without battery storage

[2] L. Hadjidemetriou, S. Philippou, A. Christofi, P. Nikolaou, P. Therapontos, S. Timotheou, "Cost-Optimal Scheduling of Electric Vehicle Charging and Battery Storage in Buildings,” in *Proc. IEEE ISGT Europe*, Budapest, 2026, pp. 1-5

Pilot Demonstration and Scale-up Impact Assessment

- **Next step:** live demonstration at the UCY campus pilot site in Nicosia (early 2027)

Install

16 V2G charging points in UCY campus

Integrate

Platform & controllers with chargers/PV/battery

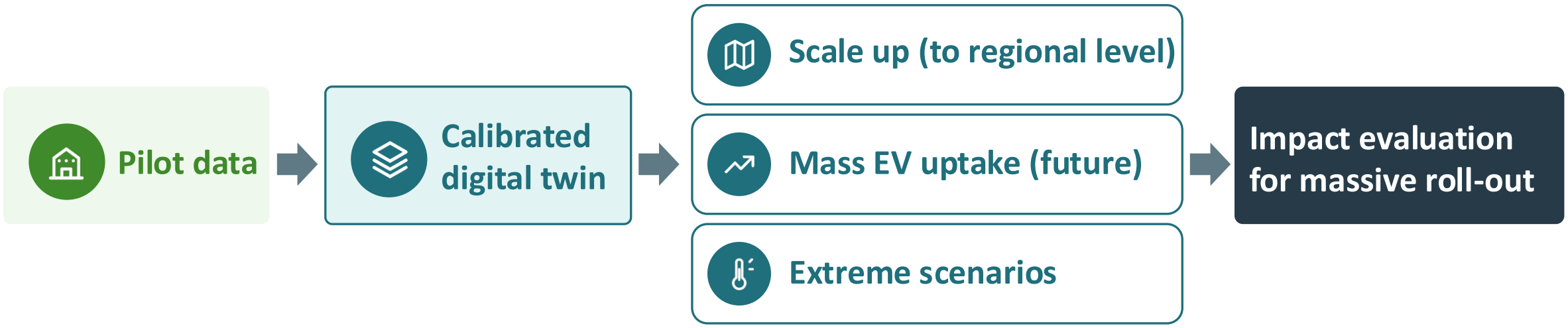
Real users

Staff & students via the app, with incentives

Evaluate

Charging cost, solar use and grid limits

- **Scale-up impact assessment:** digital twins calibrated with pilot data



Οργανωτές

ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΜΕΤΑΦΟΡΩΝ, ΕΠΙΚΟΙΝΩΝΙΩΝ ΚΑΙ ΕΡΓΩΝ

ΤΜΗΜΑ ΔΗΜΟΣΙΩΝ ΕΡΓΩΝ

Συνδιοργανωτές

ΚΑΛΑΘΟΣ ΒΙΩΣΙΜΗΣ ΚΙΝΗΤΙΚΟΤΗΤΑΣ

University of Cyprus

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Σύλλογος Συγκοινωνιολόγων Κύπρου

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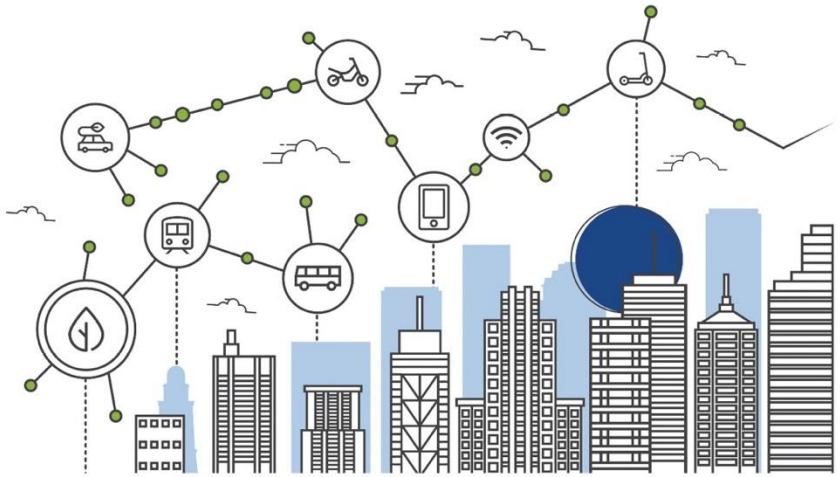
ΕΤΕΚ ΕΠΙΣΤΗΜΟΝΙΚΟ ΤΕΧΝΙΚΟ ΕΠΙΜΕΛΗΤΗΡΙΟ ΚΥΠΡΟΥ

ePowerMove

This work is supported by the Horizon Europe Research and Innovation Programme under grant agreement No 101192753 (ePowerMove)

Funded by the European Union



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Ευχαριστώ για την προσοχή σας!

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