



SUCCESS CASE 18.2026

V2G

ROLL OUT AND SCALE UP OF INTEROPERABLE V2G



Dutch DSO Stedin demonstrates a practical pathway to accelerate renewable integration by combining grid-edge flexibility, electric mobility, and digital control. In collaboration with Renault and We Drive Solar, Stedin implemented a Vehicle-to-Grid (V2G) use case that transforms electric vehicles from passive loads into active energy assets.

THE CHALLENGE

The city of Utrecht is experiencing one of the most acute grid congestion challenges in the Netherlands. Rapid electrification, combined with a very high penetration of distributed renewables, is pushing the local electricity network beyond its traditional design limits. Approximately 40% of households have rooftop solar PV, creating strong midday feed-in peaks and reverse power flows on low- and medium-voltage grids. At the same time, the accelerated phase-out of natural gas - driven by the Groningen gas field earthquake impacts, the geopolitical shock of the Russian invasion of Ukraine, and national climate targets - has triggered a rapid uptake of electric heat pumps, adding substantial winter peak demand.

Conventional grid reinforcement strategies - new cables, larger transformers, and substation upgrades - are necessary but insufficient. They face long permitting timelines, spatial constraints in dense urban areas, and rising costs. More importantly, they do not address the growing mismatch between variable renewable generation and local demand profiles. As a result, even with planned investments, connection backlogs for new loads and generation are increasing, and curtailment risks are emerging.

THE SOLUTION

This context required a complementary approach: unlocking flexibility within the existing infrastructure. Distributed energy resources, particularly electric vehicles with bidirectional charging capability, can provide controllable capacity that absorbs solar overproduction, mitigates peak demand, and supports local grid stability. By shifting from a purely asset-based expansion model to a flexibility-driven system, Utrecht can integrate higher shares of renewables without waiting for long-lead network reinforcements.

MAIN ACHIEVEMENTS:

+500 bi-directional vehicles, supporting the congested grid with tangible flexibility (fig 1. next page).

On a broader scope: The cross-sector collaboration between automotive and energy makes this unique and a good example of European cooperation, truly in the spirit of the Draghi report on European competitiveness through innovation.



KEY SUCCESS FACTORS

Key achievements include the successful deployment of a multi-vehicle V2G fleet with commercially available hardware, real-time participation in flexibility markets, and validated interoperability between automotive, charging, and grid systems.

The project demonstrated measurable CO₂ reduction through increased renewable utilization, improved local grid stability, and new revenue streams for EV assets.

Importantly, it proved that V2G can be scaled using standard interfaces and replicable operational processes, lowering the barrier for broader adoption. By integrating transport electrification with power system needs, it provides a blueprint for sector coupling at scale.

The joint implementation showcases how cross-industry collaboration can unlock distributed flexibility and support a resilient, renewable-dominated energy system.

WAY FORWARD

Quantitative: ambition to scale up to 10.000 bi-directional vehicles

Qualitative: have more vehicle brands available, creating an open market. Unlock V2H for households. Coordination flexibility via GOPACS platform

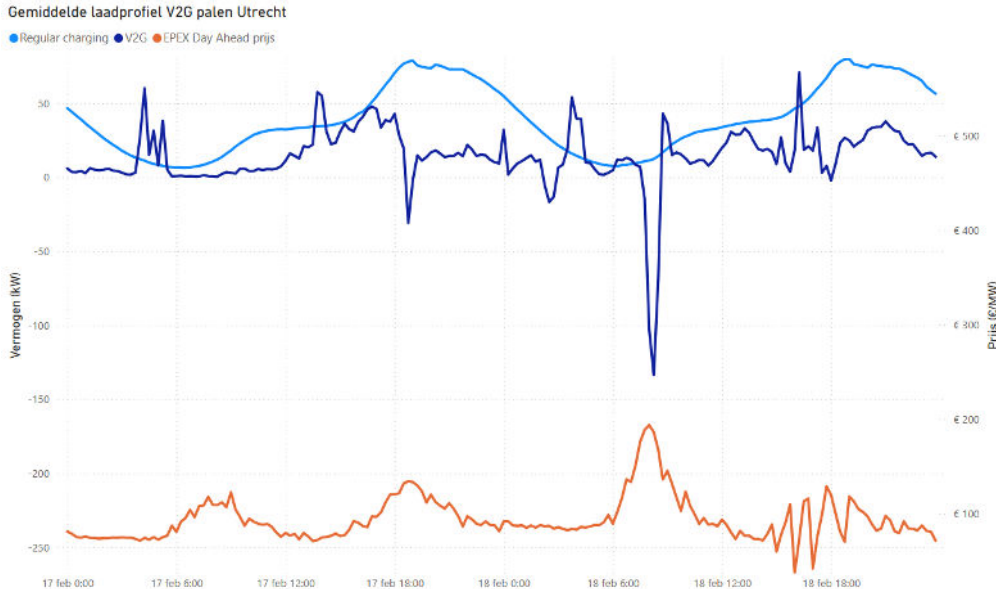


FIG. 1. IMPACT OF V2G BASED ON FIRST BATCH OF 100 VEHICLES IN FEBRUARY 2026. JULY 2026: OVER 500 V2G VEHICLES AVAILABLE