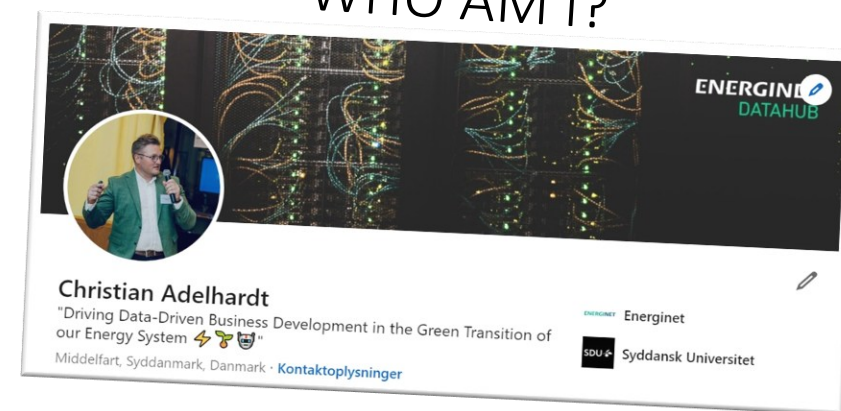


A TSO perspective on V2G, the potential, the challenges and the future developments in EU

*Christian Adelhardt,
Business Development, Energinet*

WHO AM I?



GREEN ENERGY FOR A BETTER WORLD

We safeguard the society's interests as we move to a 100% green energy system.

We are owned by the Danish Ministry of Climate, Energy and Utilities.

The Danish TSO with a workforce of around 2500 split between 7 locations.

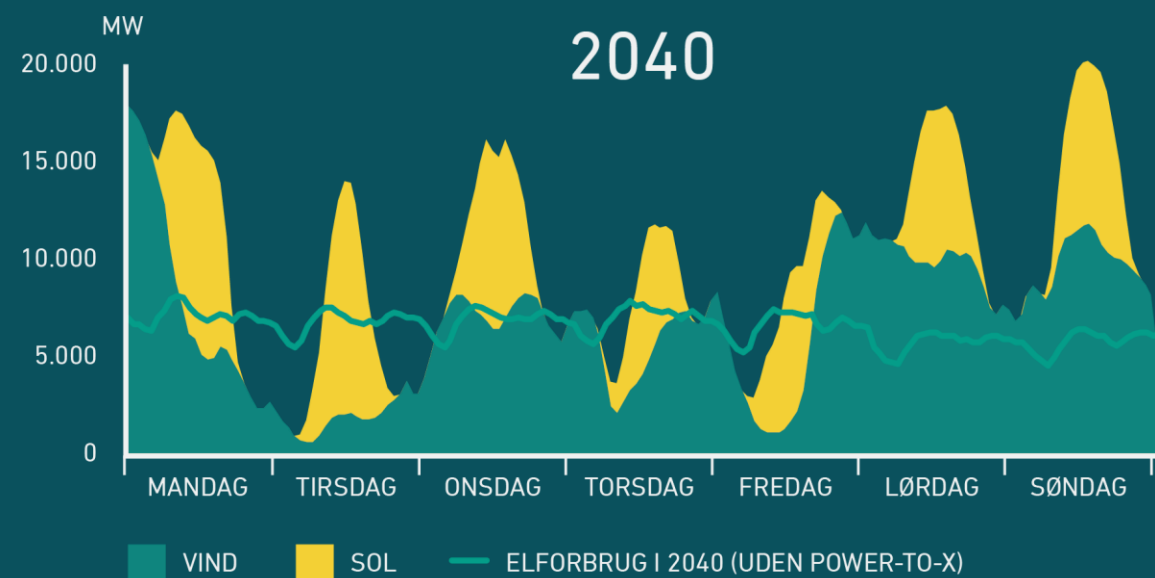
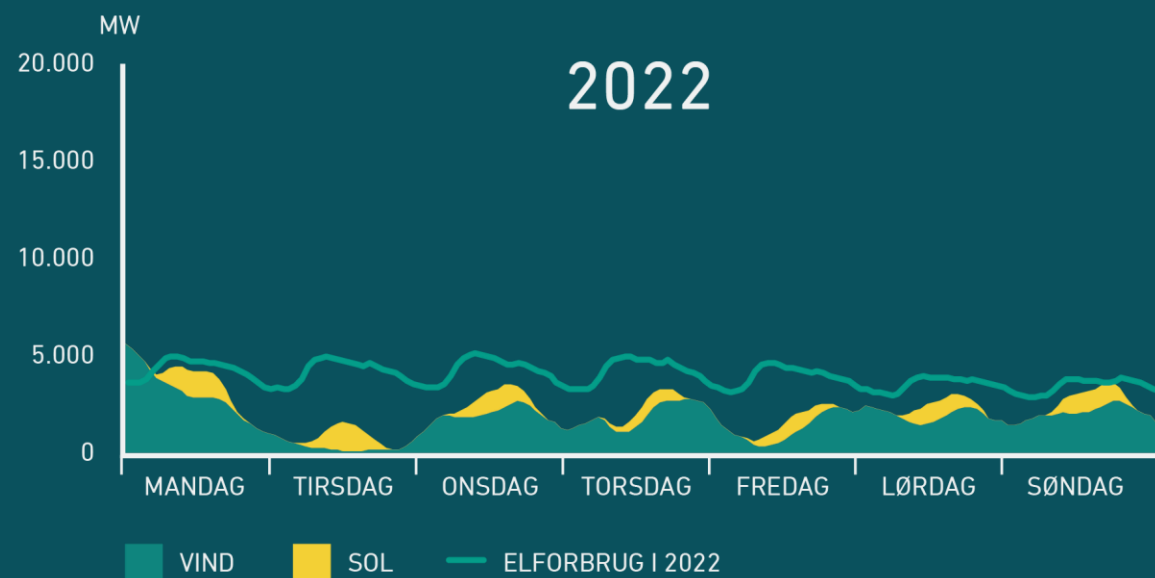


WE ENSURE BALANCE
MINUTE BY MINUTE

The background image shows two men in a control room. They are standing in front of a large wall of digital displays. The central display is a map of Europe with a complex network of red and yellow lines representing power transmission routes. To the left of the map are several smaller screens showing various data visualizations, including line graphs and bar charts. To the right of the map are two large screens displaying detailed circuit diagrams or power system schematics. The men are pointing at the map, indicating they are actively managing the system. A teal semi-transparent banner is overlaid on the bottom left of the image, containing the text 'WE ENSURE BALANCE MINUTE BY MINUTE'.



PRODUCTION VS COMSUMPTION





V2G – ENERGY ON WHEELS

Are all the new charge points going to be our best friends or our worst enemies? **Telecom** some how had this change back in the 90's and beyond....



WELL-FUNCTIONING MARKETS

Energinet participates in the development of energy markets and market rules in Denmark, the Nordic countries and the EU.



BEFORE 2010

Marked
communication

TODAY 2025

DataHub as is

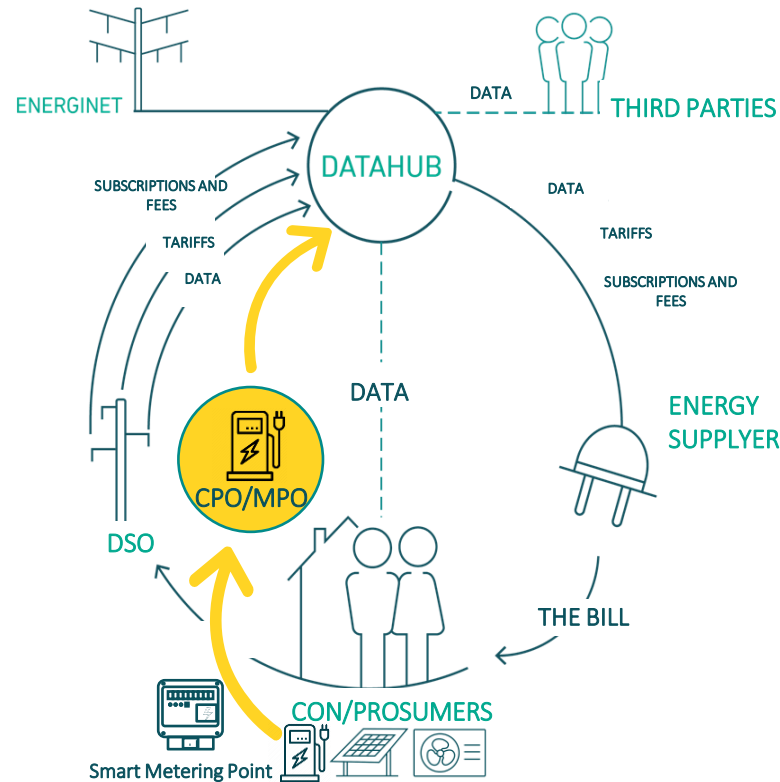
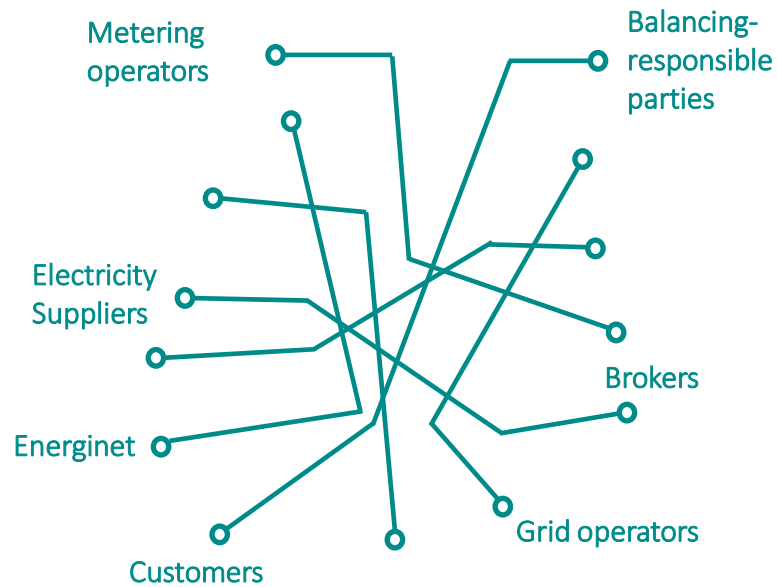
TOMORROW

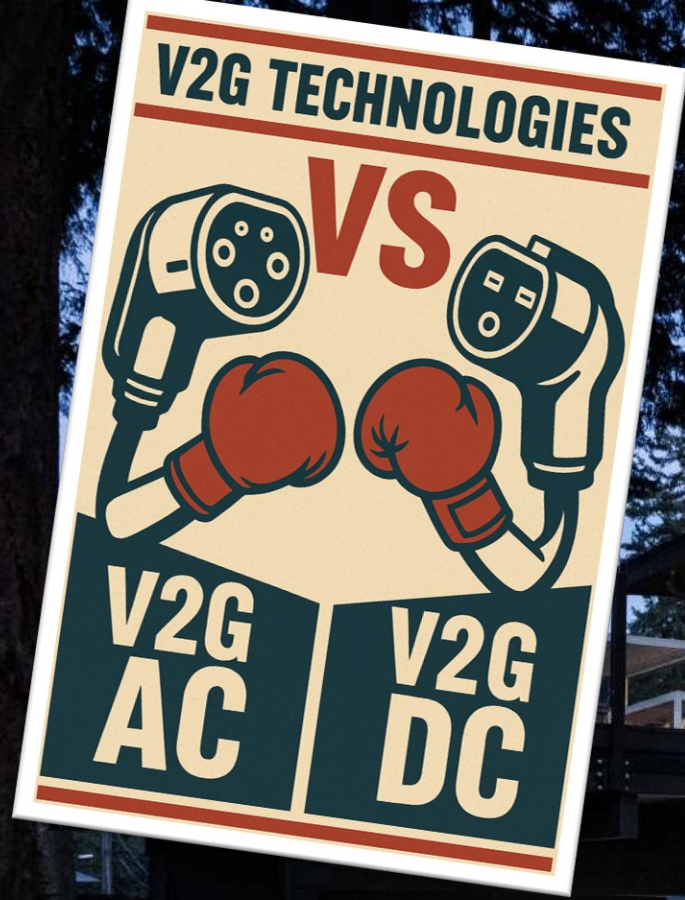
Current add-ons:
Imbedded metering

BEYOND

SELF-SOVEREIGN
IDENTITY?

Identification, authorization,
and delegation





METHODS WE USE AND OBSTACLES THAT WE (STILL) FACE!

It is essential to find appropriate solutions for a system design that fosters effective integration and collaboration between the mobility and energy sectors.

- ✓ Demonstrating the possibilities
- ✓ Preparing existing systematics
- ❓ Establishing new alliances
- ❓ Transforming through regulation

Coalition of the Willing on Bidirectional Charging from 2025

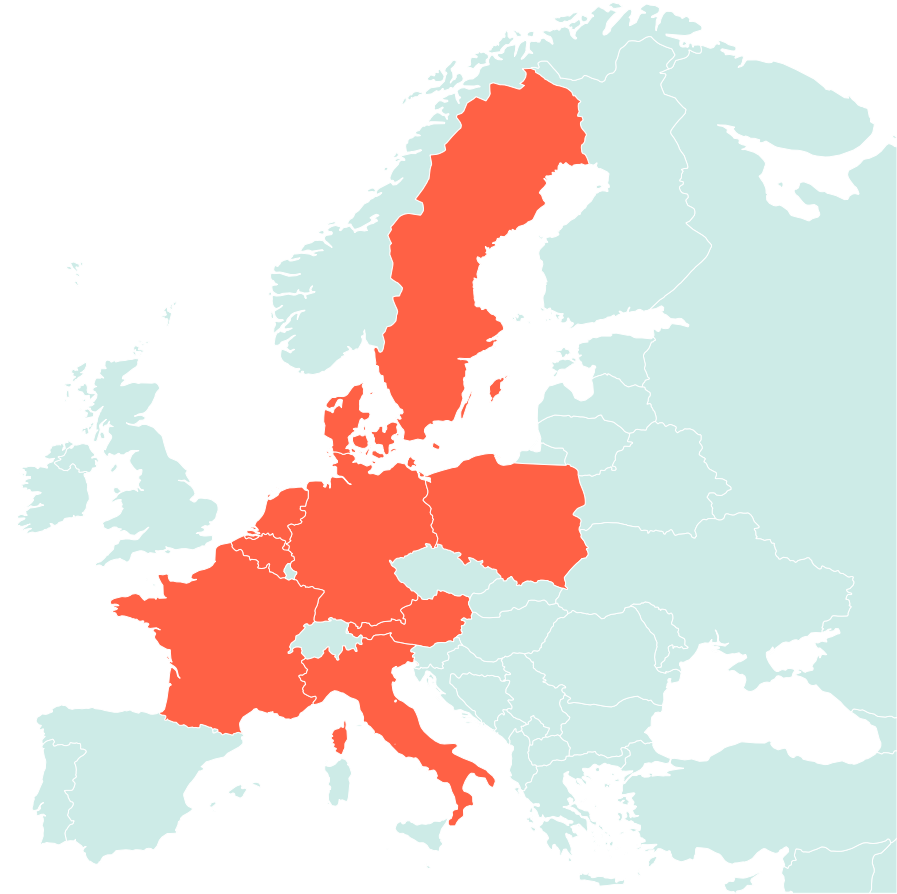
A cross-industry initiative

9 European countries coming together in this **Pan-European initiative**

150 Industry players covering the **whole value chain** in the e-mobility and energy ecosystem

1 Common goal: establishing a **level playing field** for bidirectional charging across Europe

4 Reports documenting the **results** of a year of intense work **now available**



Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de) Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de) Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de) Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de) Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de) Bundesministerium für Wirtschaft und Klimaschutz Federal Ministry for Economic Affairs and Climate Action [bmwk.de](https://www.bmwk.de)

Jaeckel

Kluttig

Habeck

Hofmann

Blohm

End-to-End Meeting of the coalition of the willing bidirectional charging
Welcome by Minister Dr. Habeck

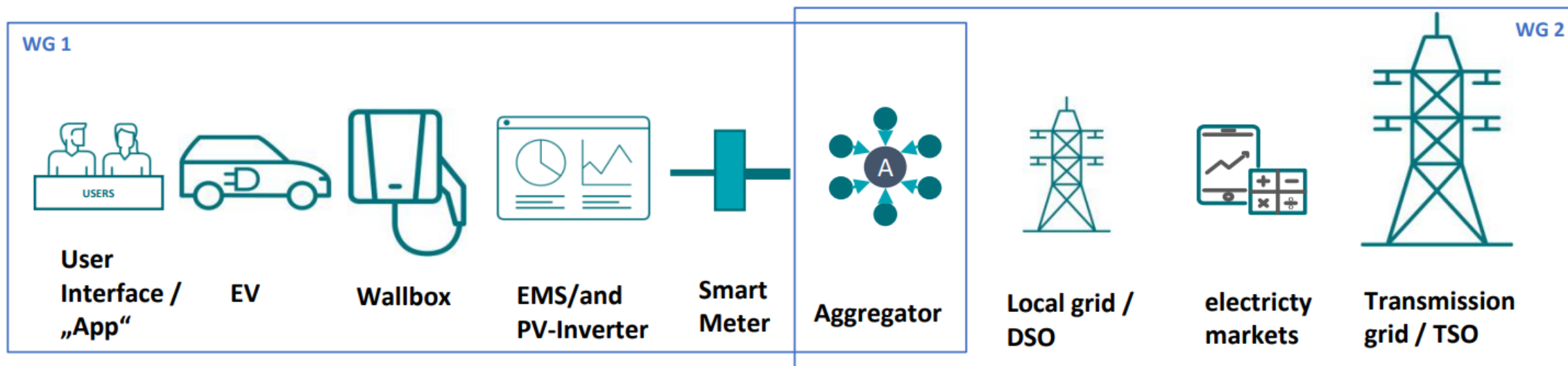
JOINT REPORT

by European Working Group 1 “Car Charging and Aggregators”
and European Working Group 2 “Energy and Grid Topics” in the
“Coalition of the Willing on Bidirectional Charging from 2025”

Why V2G for the consumer, the industry and the grid?

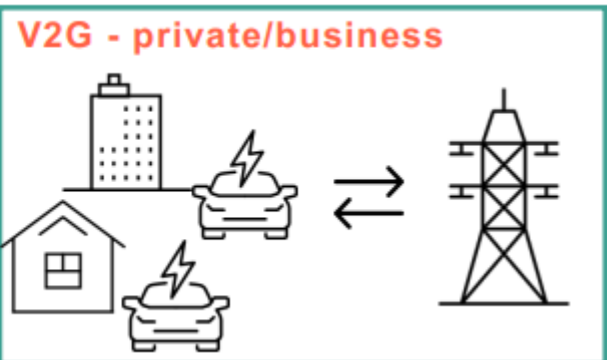
Main take aways?

- We need data sharing
- We need standards
- We need a level playing field





- Energy Communities and V2G is coming up.
- 



WHAT IS NEXT?

The industry is accelerating,
while regulation keeps a close watch



Working simultaneously...

Sustainable Transport Forum sub-group on governance, standards and data (STF)

Data for Energy, sub-group on flexibility, smart and bidirectional charging (D4E)

Coalition of the Willing on bidirectional charging (CoW)

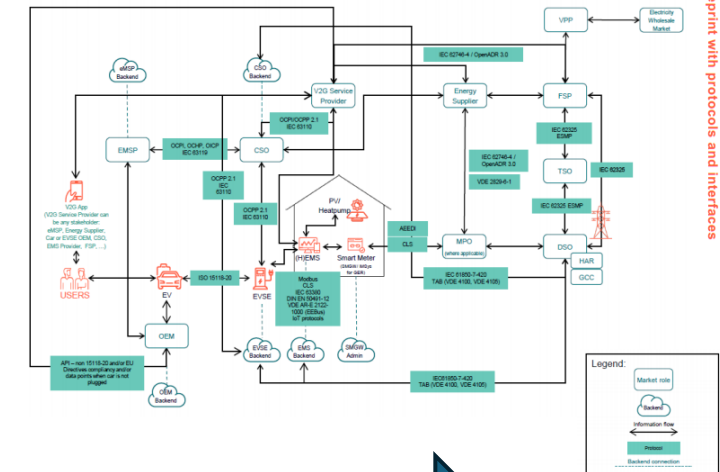
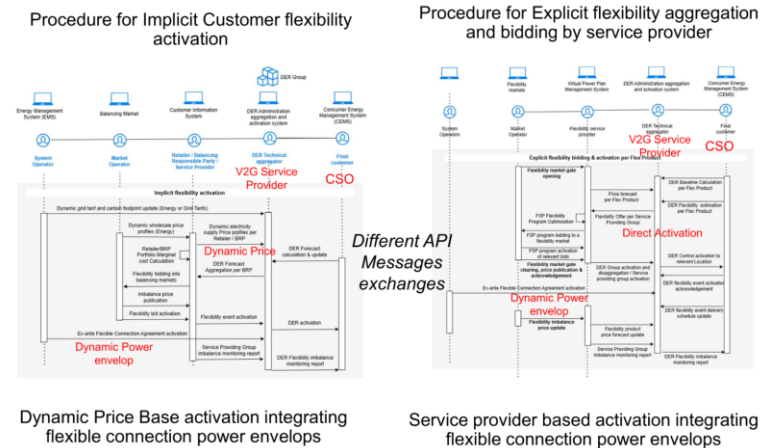
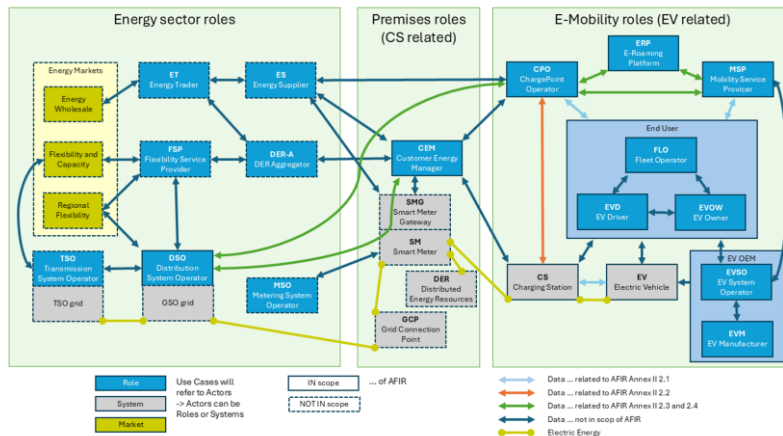


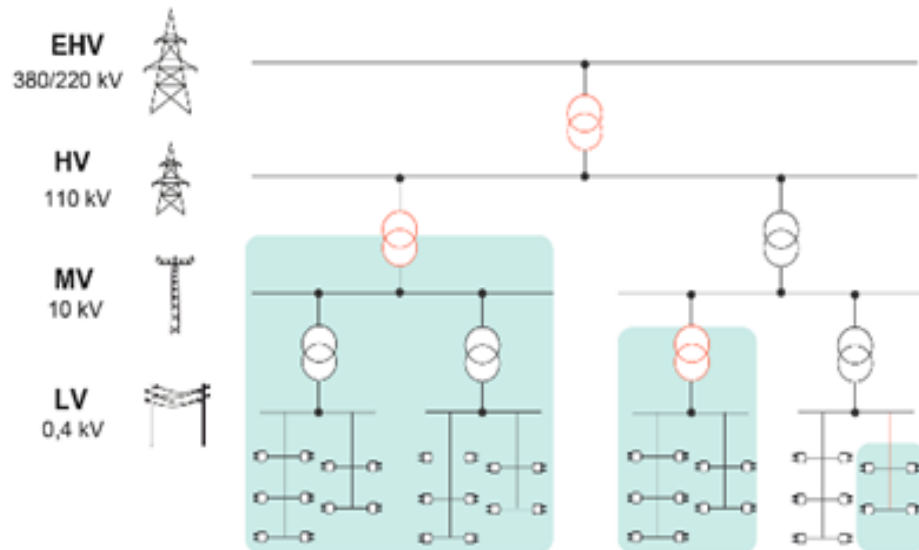
Figure 3: Blueprint with protocol and interface

Blueprints - Definitions - Responsibilities - Roles – Usecases - Interfaces

POWER FROM THE EDGE OF THE GRID

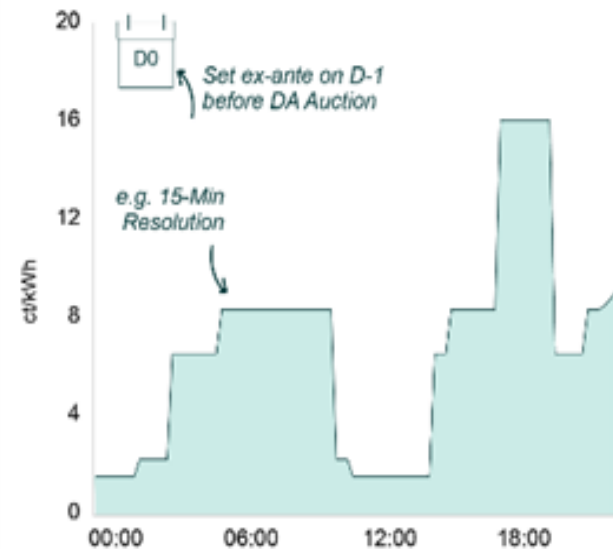
A coordination goal from the grid - OBS Draft from CoW 2025 report.

Spatial Granularity



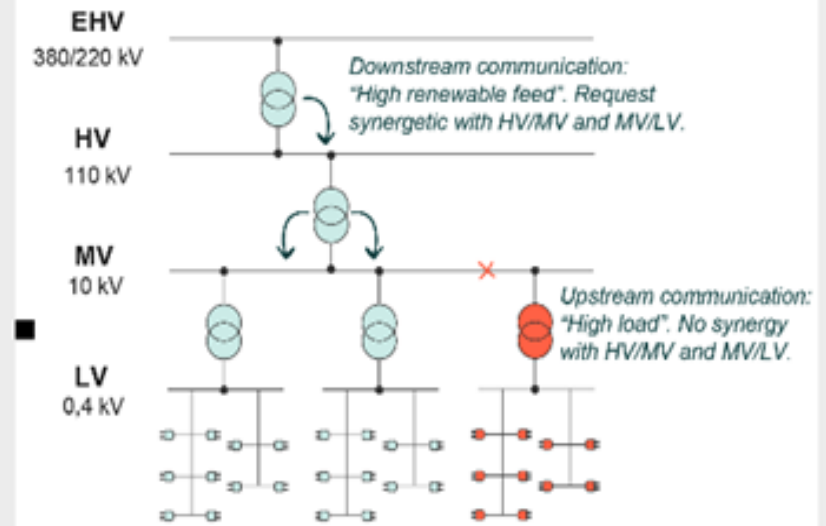
Congestion occurs locally on different voltage levels (red). Therefore, predictive measure can be implemented at different levels of spatial granularity (shaded green), such as high-to-medium voltage, medium-to-low voltage or on the level of individual feeders.

Temporal Granularity



Congestion varies depending on the time of day. Therefore predictive measures have to match this dynamic in temporal resolution. Ideally, schemes are published on D-1.

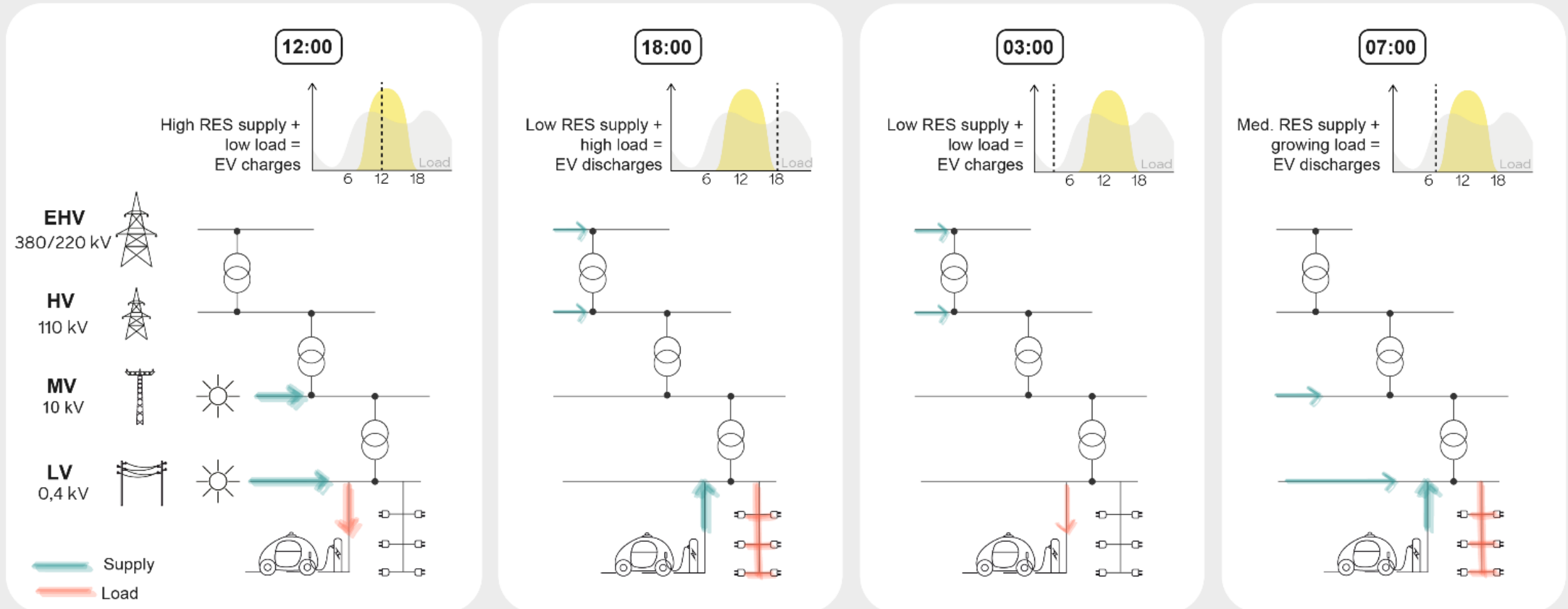
Integration across Voltage levels



Flexibility needs are aggregated across voltage levels, whereby lower levels overrule requirements of the respective upstream level. Only synergetic demand is clustered across voltage levels when calculating incentives.


POWER FROM THE EDGE OF THE GRID

A coordination goal from the grid - OBS Draft from CoW 2025 report.



2025 – THE V2G YEAR!

ENERGINET



Giovanni Palazzo • 1.
Global SVP Charging & Energy // CEO of Elli // Chair Electrify America
12t •

The future of smart energy starts at home... big time

At IAA Mobility 2025, **Elli** proudly launched its first pilot project for bidirectional charging in private households - revealed during the **Volkswagen Group** Technology Day Tech Talk!

Your EV, your energy source:
Bidirectional charging means your electric vehicle can now power your ho enabling true energy independence. With the first phase of our Managed Network, EV batteries and storage systems become system-relevant energy bridging mobility and energy.

Pilot Highlights:
 Home-powered by EV: Seamlessly manage energy flows between grid and home via the Elli Charging app.
 Advanced tech: Featuring an 11kW DC charger by **CUBOS**, integrated modular software platform.
 Energy transition support: Future integration into Elli's Managed Battery to optimize renewable energy and enable energy trading across Europe.

Join the pilot starting December 2025
Available to Volkswagen Group customers and **Otovo** solar system clients Germany. Participants receive a DC bidirectional charger and firsthand experience smart home charging

Apply now:
<https://lnkd.in/gVZQUZY>

[#IAAMobility2025](#) [#TechDriver](#) [#BidirectionalCharging](#) [#SmartEnergy](#)
[#VolkswagenGroup](#) [#Elli](#)

Vis oversættelse





Manfred Przybilla • 1.
CEO Ambibox / DC Technology
2d • Redigeret •

MG Bidirectional Charging

Sales start this Friday

For anyone who wants to use their MG and Maxus vehicles bidirectionally, we now offer the BiDi feature together with our wallbox. We are currently using the vehicles in several pilot projects. Anyone who wants to use their car as a power bank can order our Bidi wallbox from our website starting Friday.

Our wallbox has also been approved by the manufacturer for Volkswagen's MEB vehicles under the Skoda, Seat, VW, and Buzz brands, as well as Ford. The grid codes are compliant throughout Europe, with the UK starting in January 2026. The retail price starts at €2,995 for end customers in 2026, plus country-specific sales tax, minus tax breaks and subsidies.

[#ambibox](#) [#BiDi](#) [#V2H](#) [#V2G](#) [#V2B](#)

Vis oversættelse



Du og 160 til 23 kommentarer • 15 genopslag




Alexander Gaytandjiev • 1.
Senior Business Manager bei E.ON impulse GmbH
1d • Redigeret •

This is the real kick-off for bidirectional charging in Germany.

Together with **BMW Group**, **E.ON** launched the first series **#V2G** pro... mere

Vis oversættelse



Octopus Energy
311.694 følgere
2md. •

The car's out of the bag Live at the [#EnergyTechSummit](#), **Greg Jackson** launches Britain's first EV vehicle-to-grid bundle with **BYD**. ... mere

Vis oversættelse






Robin Berg • 1.
Founder & CEO at We Drive Solar & LomboXnet
[Besøg mit websted](#)
2md. •

In this fantastic video **Imogen Bhogal** explains very clear what is happening in Utrecht, why it happens in Utrecht and why not yet all over ... mere

Vis oversættelse



Everything Electric
19.036 følgere
2md. •

NEW, NOW

Imogen travels to the beautiful city of Utrecht. Known as the world's first bidirectional city, they have just launched the largest vehicle-to-grid car sharing system in the world...with Renault 5's!!
<https://buff.ly/nWaVYz>

Vis oversættelse

