

A photograph of a city street with tram tracks, a pedestrian bridge, and a blue hexagonal grid overlay. The scene is captured from a low angle, looking down the street. The tram tracks run down the center of the road. A pedestrian bridge crosses the street in the background. The sky is bright, suggesting a sunny day. The blue hexagonal grid is overlaid on the bottom half of the image, extending from the left edge towards the right.

Integrating Electromobility: Between potentials and challenges

Jakob Zahler

Research creates knowledge – knowledge creates practice



>70

Academics

Promoting young talented academics.



75

Years of experience

Transformation for society, politics
and the economy.



>1500

Projects & References

Independent scientific analyses.

Our work

The best of research and consulting

Transfer of scientific methods
and results into practice

Research



Consulting



Partner & Customers



In collaboration

- Joint projects
- Implementation, demonstration, Living Labs
- Accompanying research



We offer

- Studies & expert opinions
- On-site consulting
- Implementation support
- Training and guidelines

Focus on electromobility

Our projects: From research and pilot trials to widespread use!



Our projects support the path from research to practice.



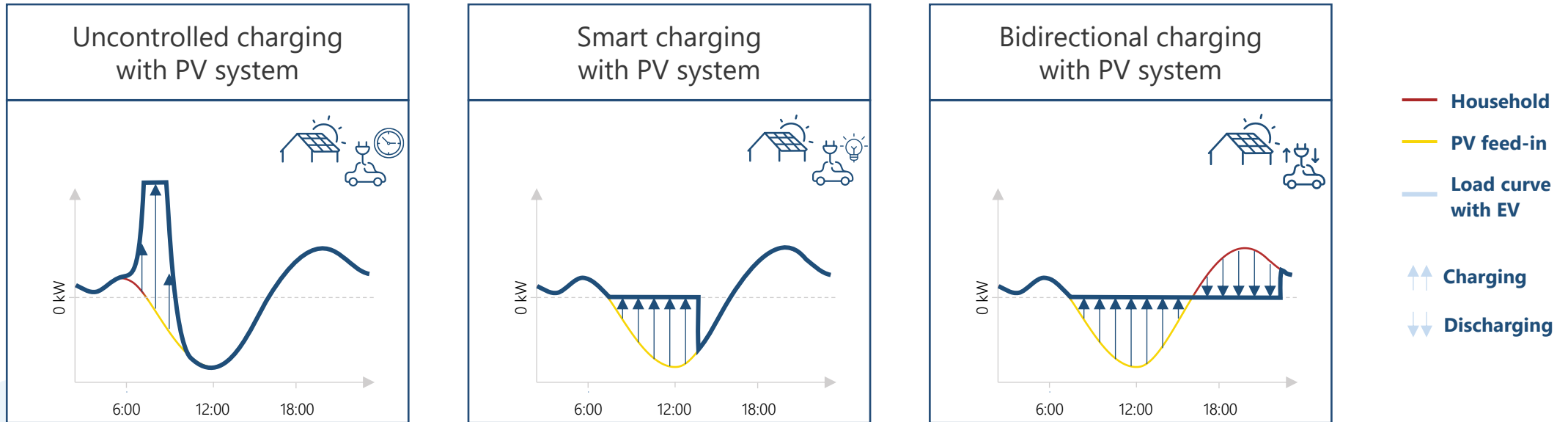
Our projects bring together key partners who map the entire value chain.



Project partners from the unIT-e² project

PV self-consumption optimization (V2H)

Bidirectional electric vehicles can significantly increase the benefits of a PV system



350 – 490 €/year savings



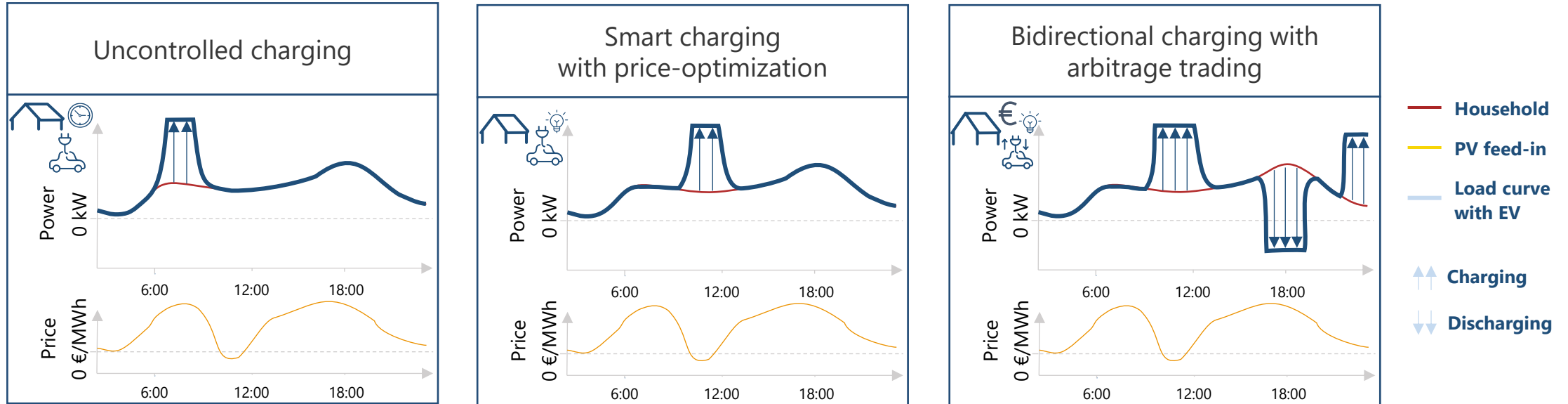
+ 30 - 35 % share of self consumption

- The vehicle takes over the task of home battery storage
- This means that less electricity has to be drawn from the grid and fed back into the grid
- Less than 20 additional full cycles per year

*Bidirectional charging means that more storage capacity is available

Intraday Arbitrage Trading (V2G)

Variable electricity tariffs become particularly attractive with bidirectional electric vehicles

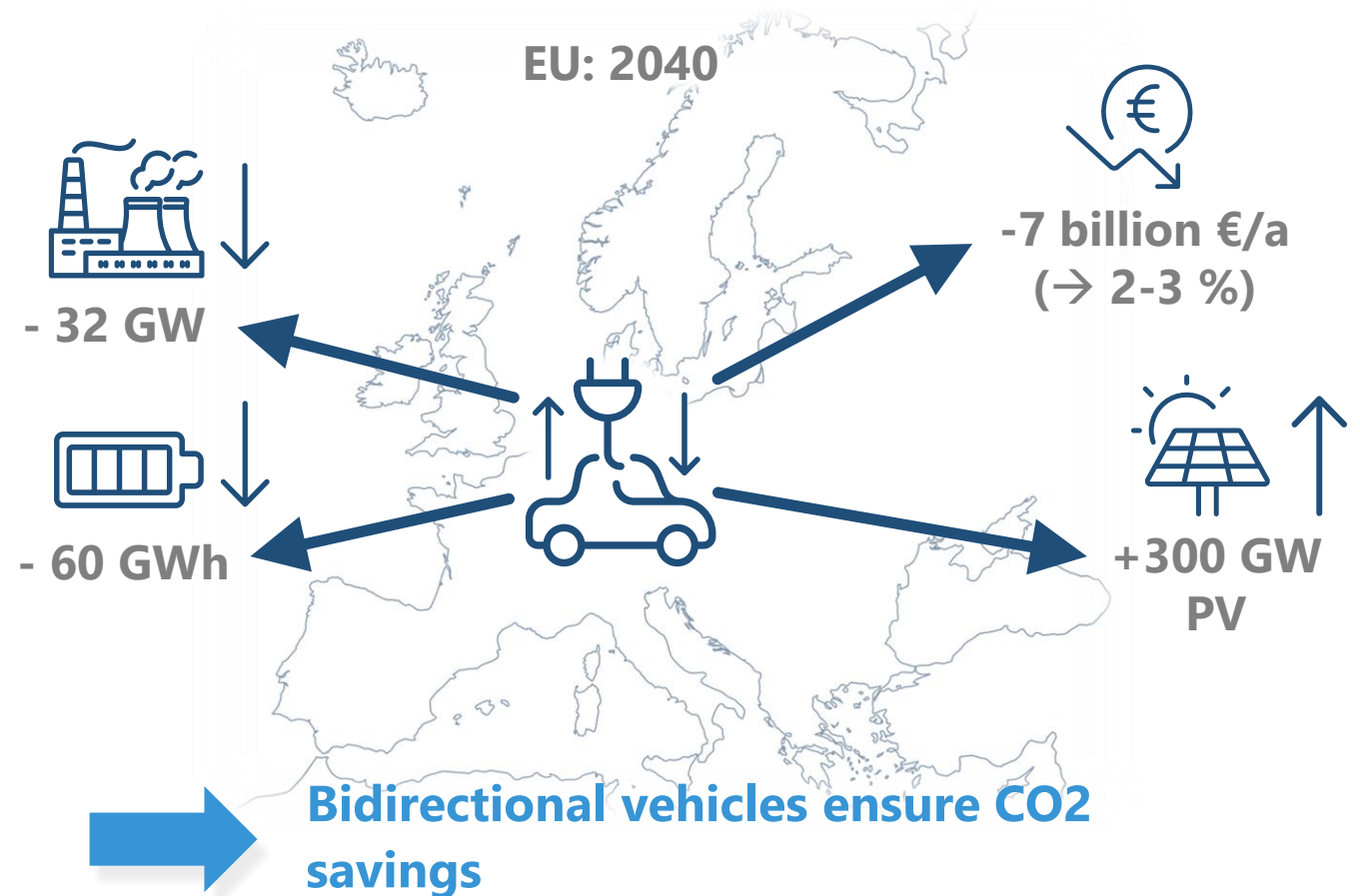
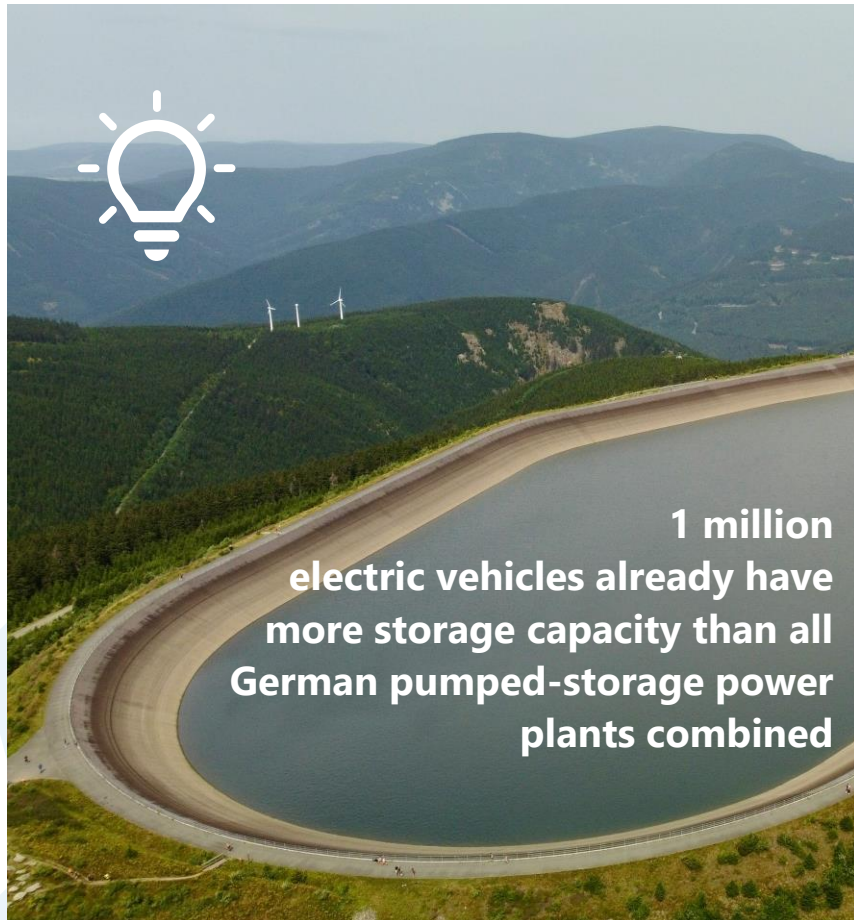


150 – 690 €/year savings

- The vehicle can earn money by trading electricity while it is parked
- Important influencing factors are price fluctuations on the electricity exchange and regulation
- Depending on the conditions, more than 20 additional full cycles per year can occur-> clarify warranty conditions

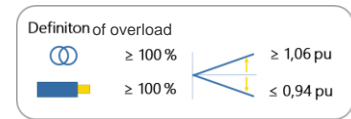
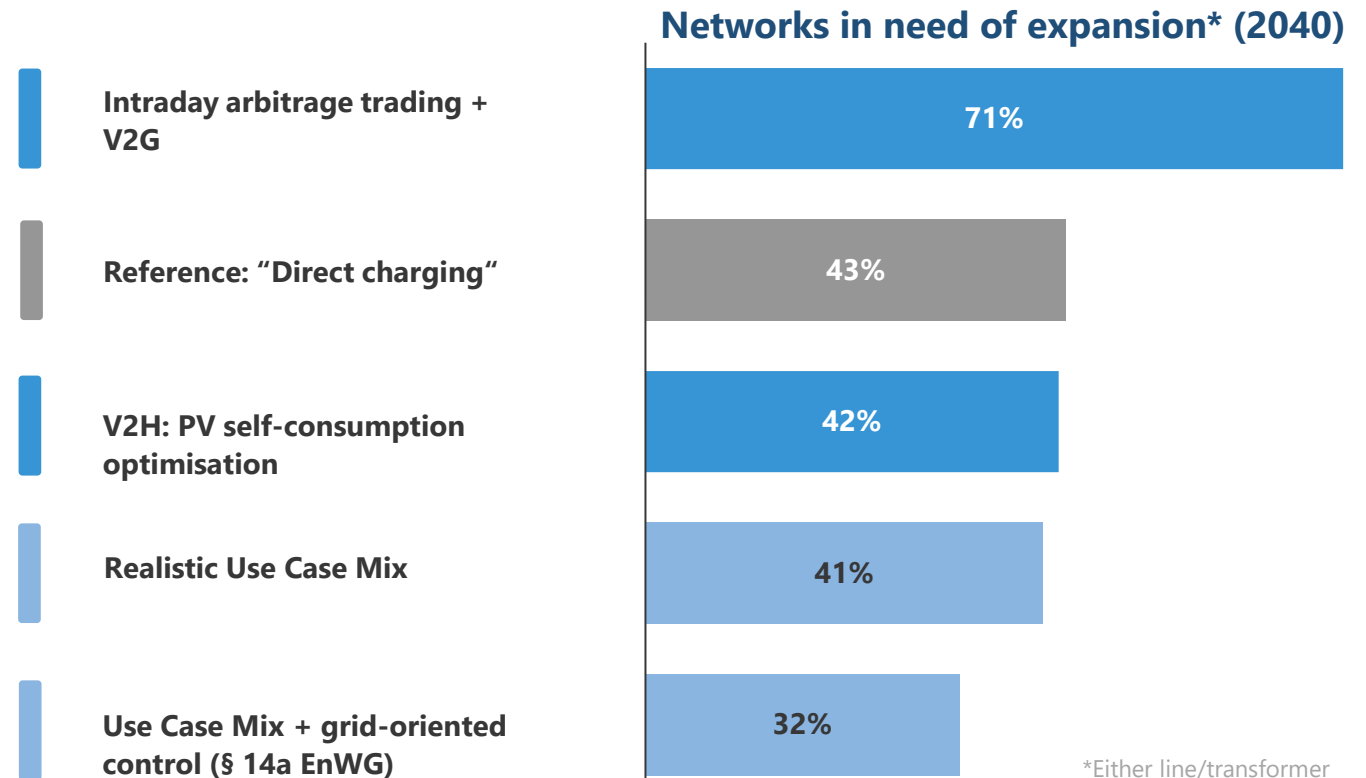
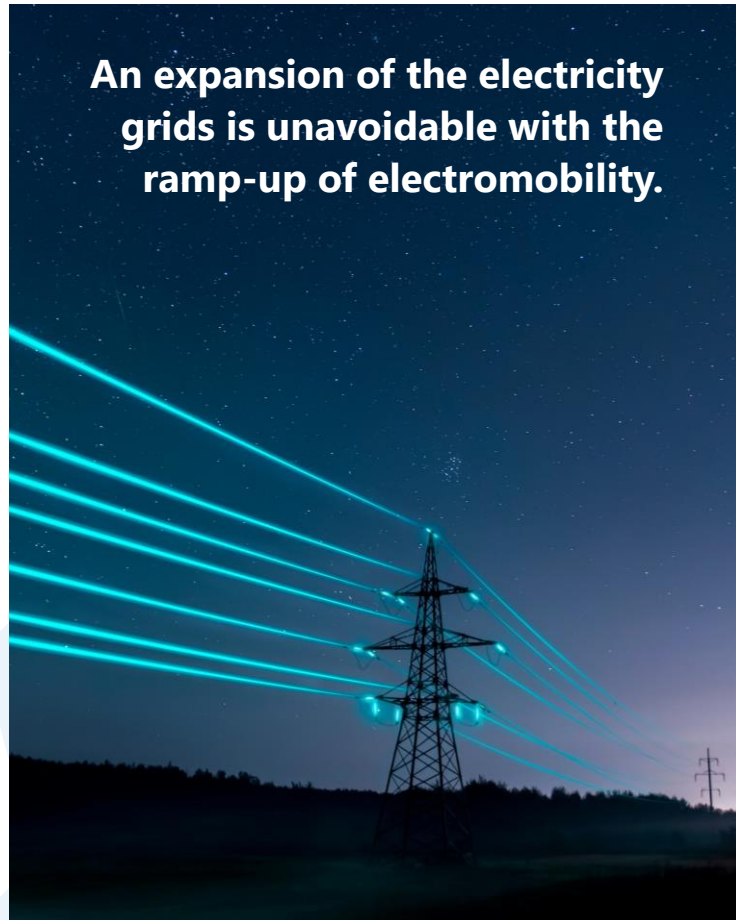
Effects of bidirectional charging on the electricity system

As daily storage units, bidirectional vehicles ensure improved integration of renewable energies



Impact of bidirectional charging on the electricity grid

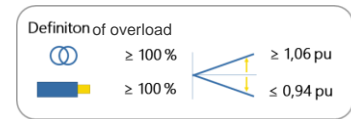
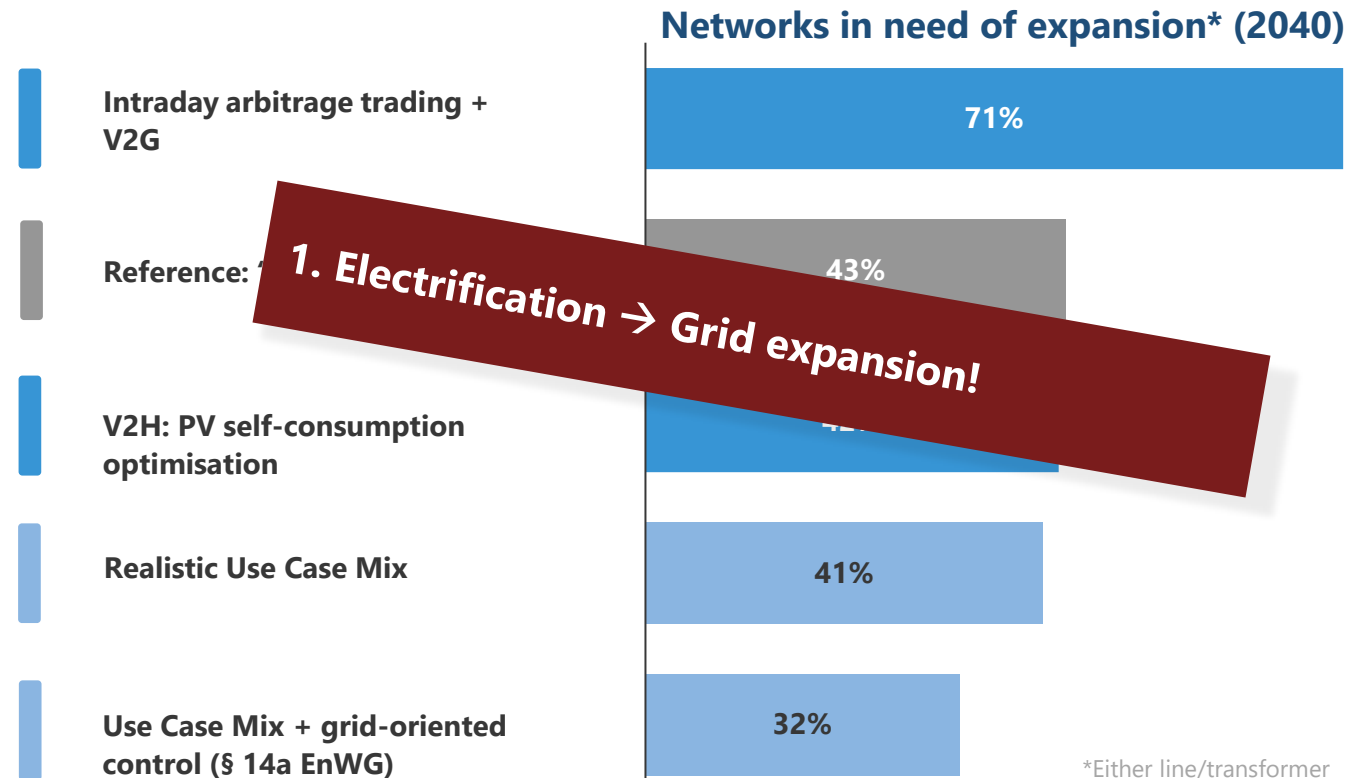
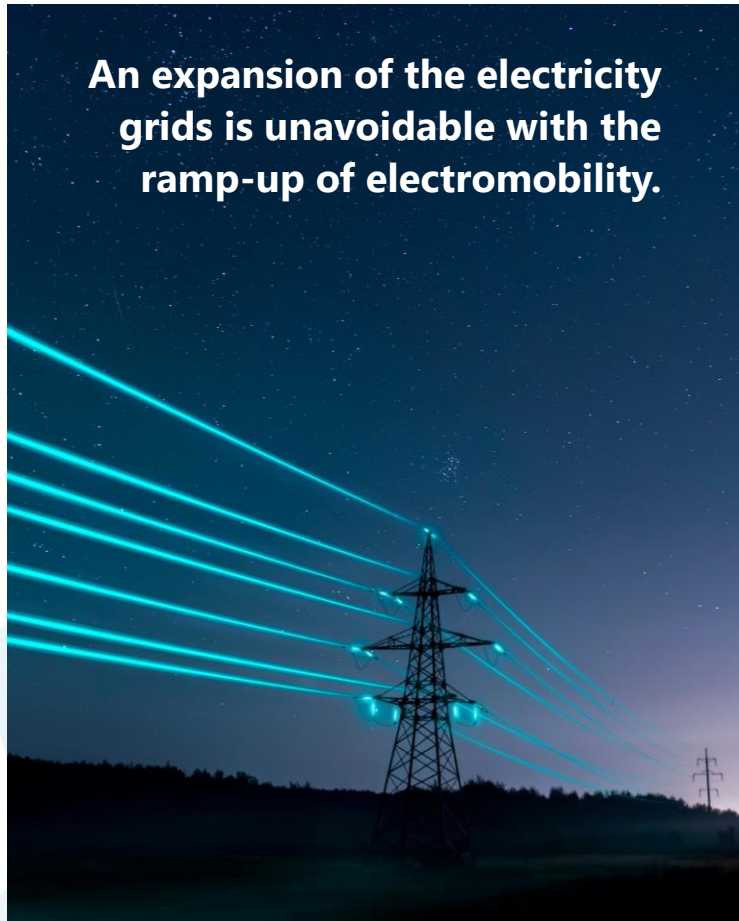
The stress on the grid depends heavily on the mode of operation; bidirectional vehicles can support the grid



*Either line/transformer overloaded or voltage outside the limit values. No direct statement about the extent of the expansion requirement in the grids.

Impact of bidirectional charging on the electricity grid

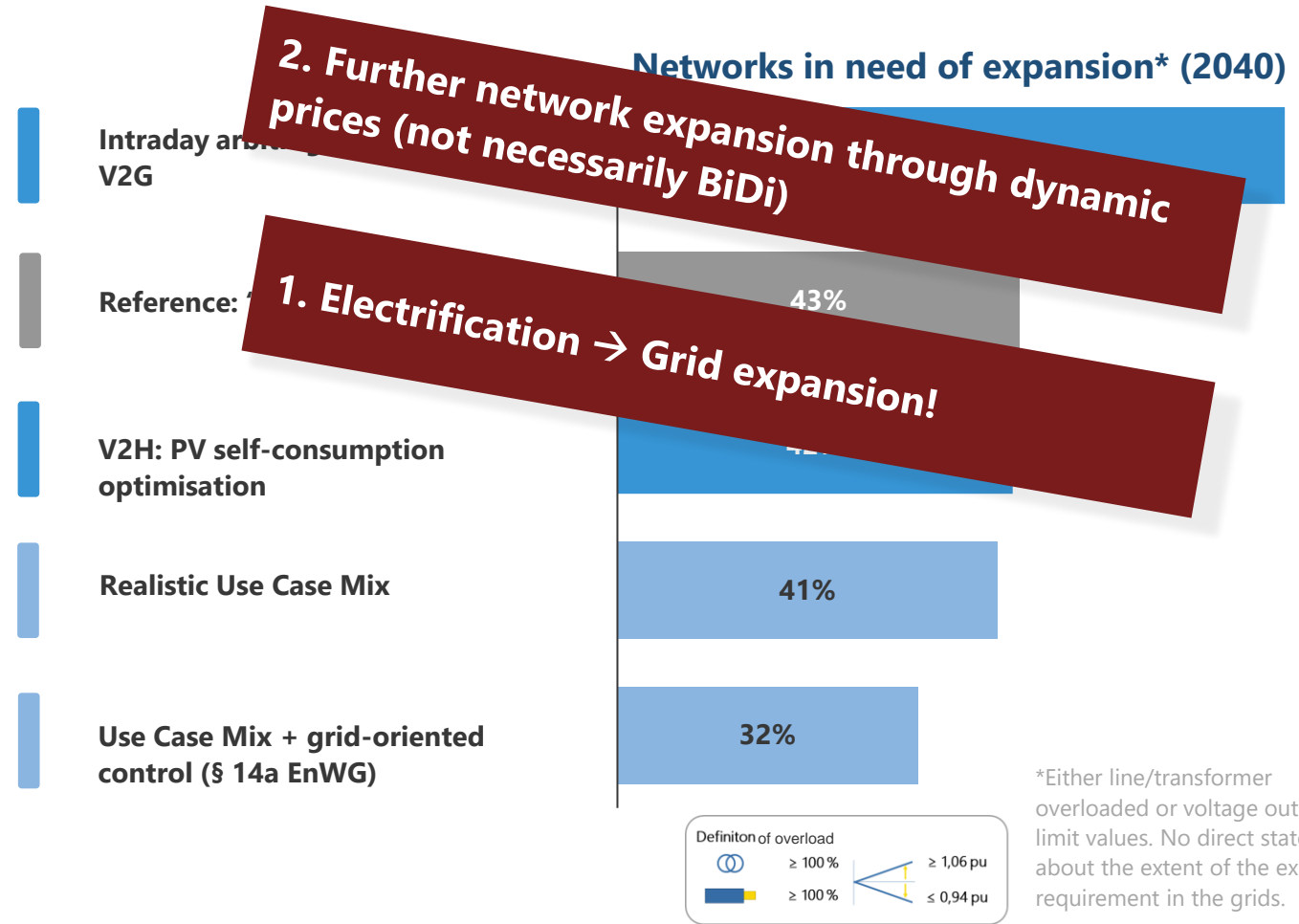
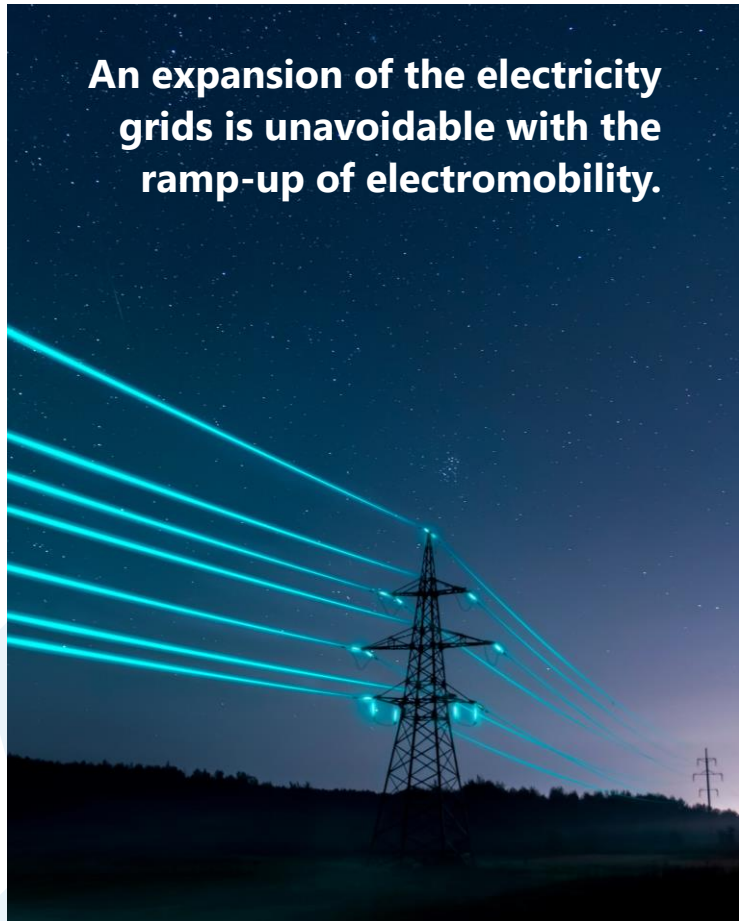
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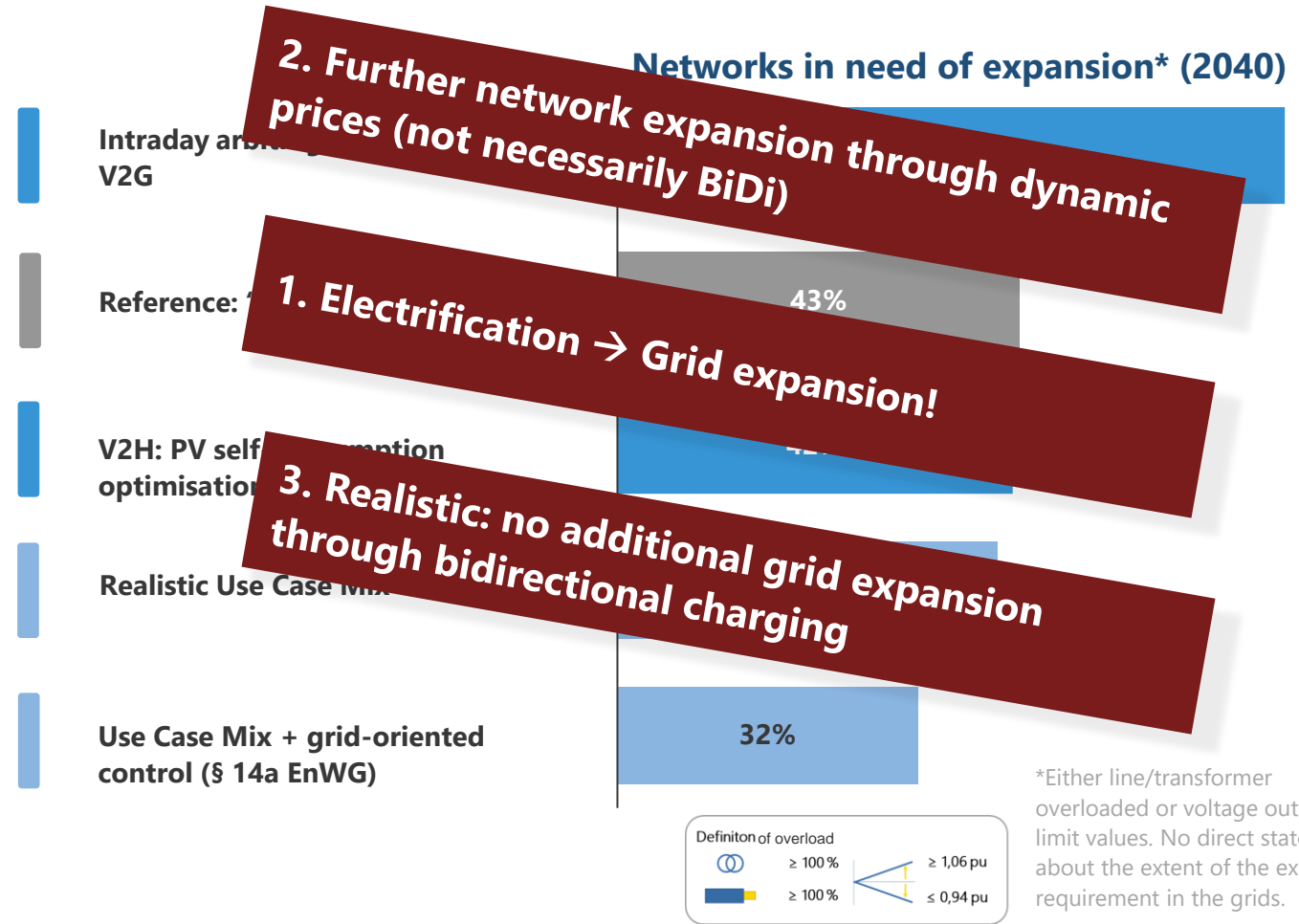
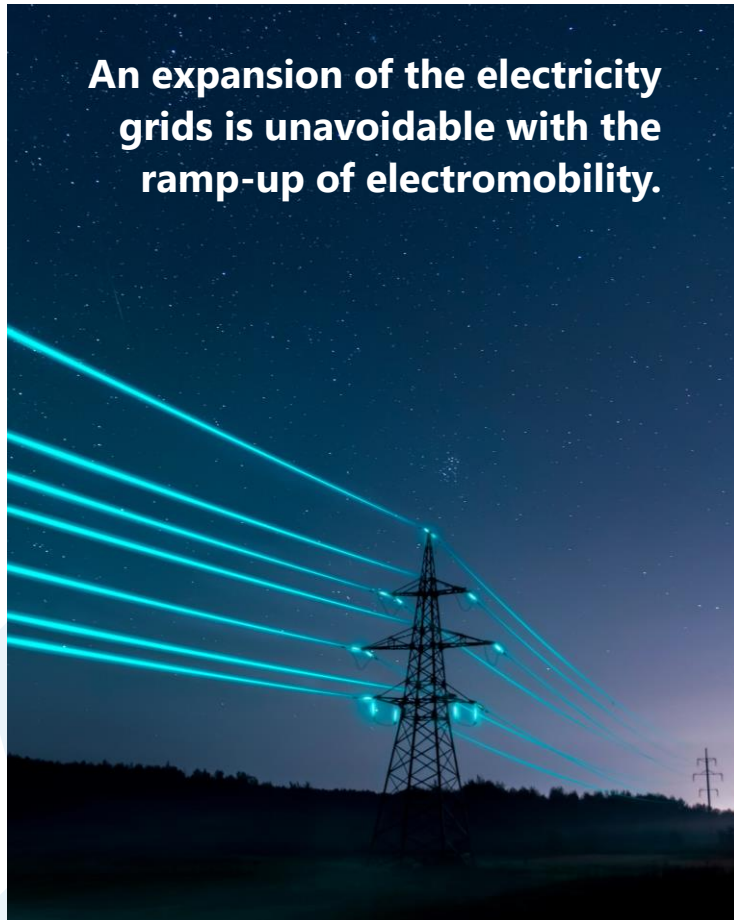
Impact of bidirectional charging on the electricity grid

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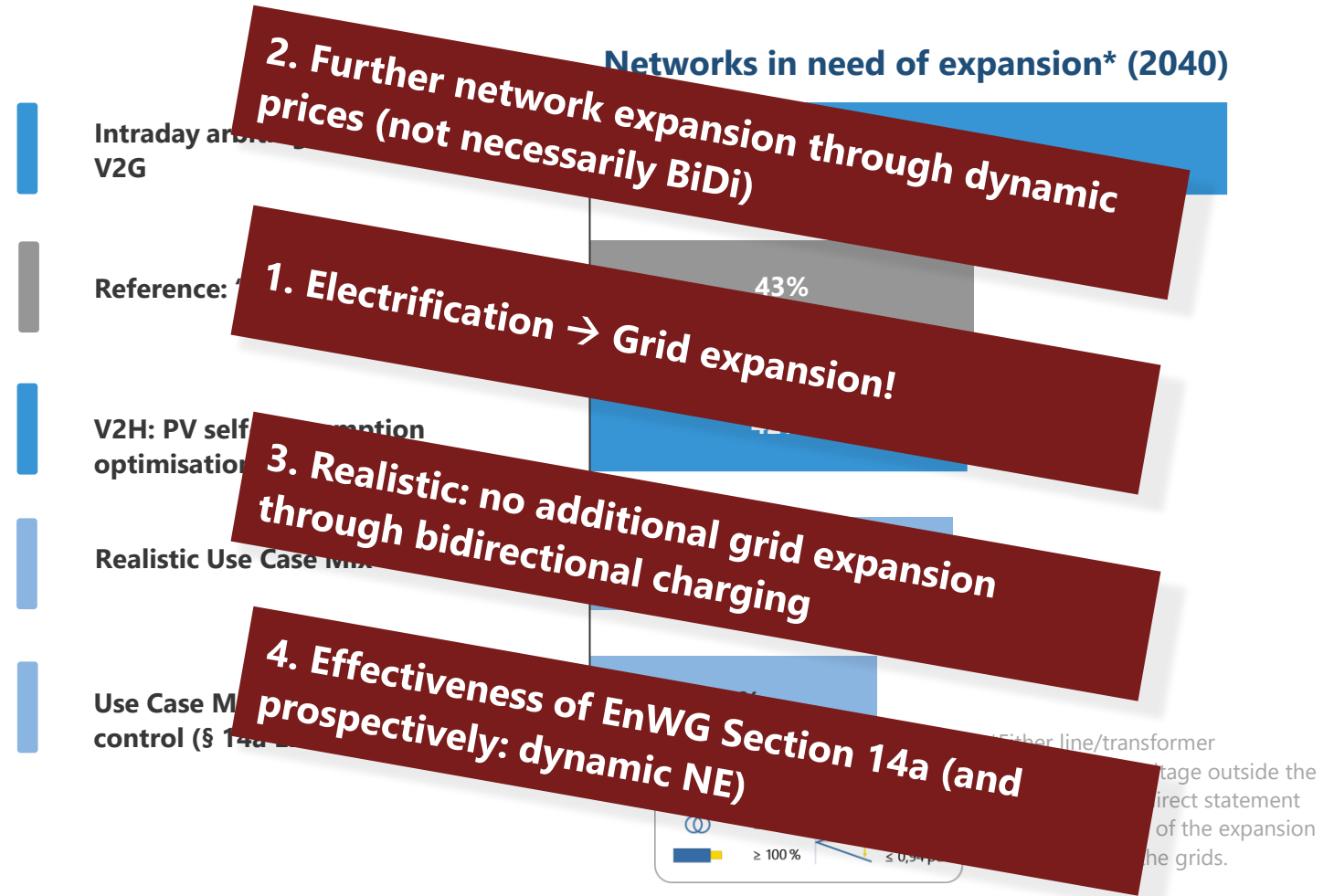
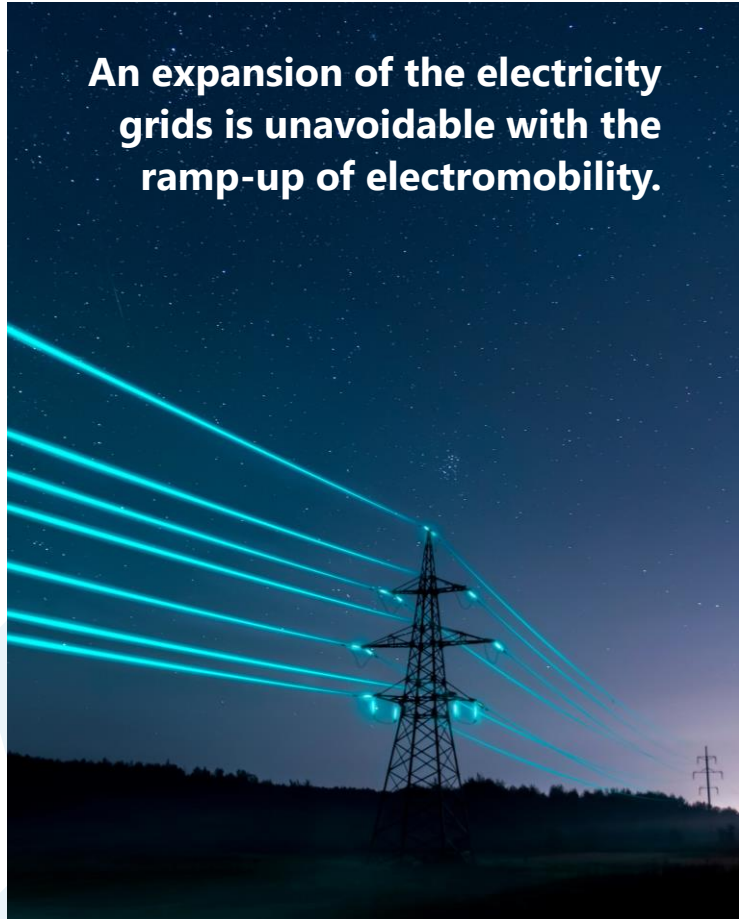
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§14a EnWG: short-term avoidance of overloads in the low-voltage grid due to new loads

The field tests in unIT-e² show: Control technically feasible without noticeable loss of convenience for customers

Nevertheless: Fundamental revision of the grid fee system by the BNetzA necessary

unIT-e² recommends: Introduction of a capacity price component and the optional dynamization of price components



Where are we with bidirectional charging?

Insights, disillusionment, confidence: from pilot tests to real operation!



V2H

V2H use cases can be realized on a large scale within the next few years.

V2G

V2G use cases will prevail if the right political framework conditions are created.

What is the problem (still)? Why don't we all charge bidirectionally?



Availability of BiDi-EVs



(Additional costs for BiDi-Hardware)



Political framework conditions



European wide standardized data exchange

If there is political will and the car/charging station manufacturers do their homework: Solvable in a few years!

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Get in touch with us to show how it can work in the core countries FRANCE and GERMANY !

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Fitting publications

Information and prospects of bidirectional charging

Summary report BCM project



[Link](#)

ADAC study on bidirectional charging



[Link short](#)



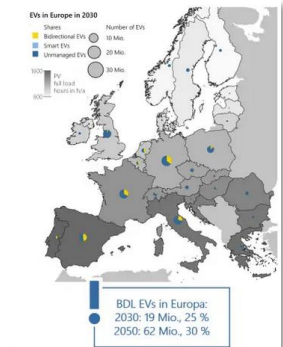
[Link long](#)

Agora study on household flexibilities



[Link](#)

More publications and information online



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