
THE WAY FORWARD

Release of the Report: A critical review – Smart Electric Vehicle Charging Strategies and Technologies



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- Goals and benefits of the study
- Stakeholder addressed
- Outlook on future trends in electromobility and smart charging



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What are the goals of the project

Goals of the project

- A detailed and comprehensive global **review on different smart charging strategies** for EVs
- Performing concrete **simulations** on smart charging strategies for EVs while considering different scenarios/use cases **with the grid data** provided by the DISCOM
- **Evaluation** of smart charging strategies and their impact on grid infrastructure
- **Recommendations for policies & regulations** for smart charging strategies for EVs and their integration with distribution grid
- Preparation of comprehensive and concrete **guidelines** for smart EV charging in India
- Recommendations on available products

Expected impact

- **Improvement of the overall environment (technical, policy, regulatory) related to EV charging infrastructure, smart charging strategies and consumer response**

Stakeholder and benefit from the project results

Recommendations for **smart charging strategies** and **infrastructure components** for various **stakeholders**

- State Governments in India,
- planning and regulatory agencies
- DISCOMs (distribution system operators)
- transmission system operators,
- and other stakeholders (EV, charging infrastructure industry)

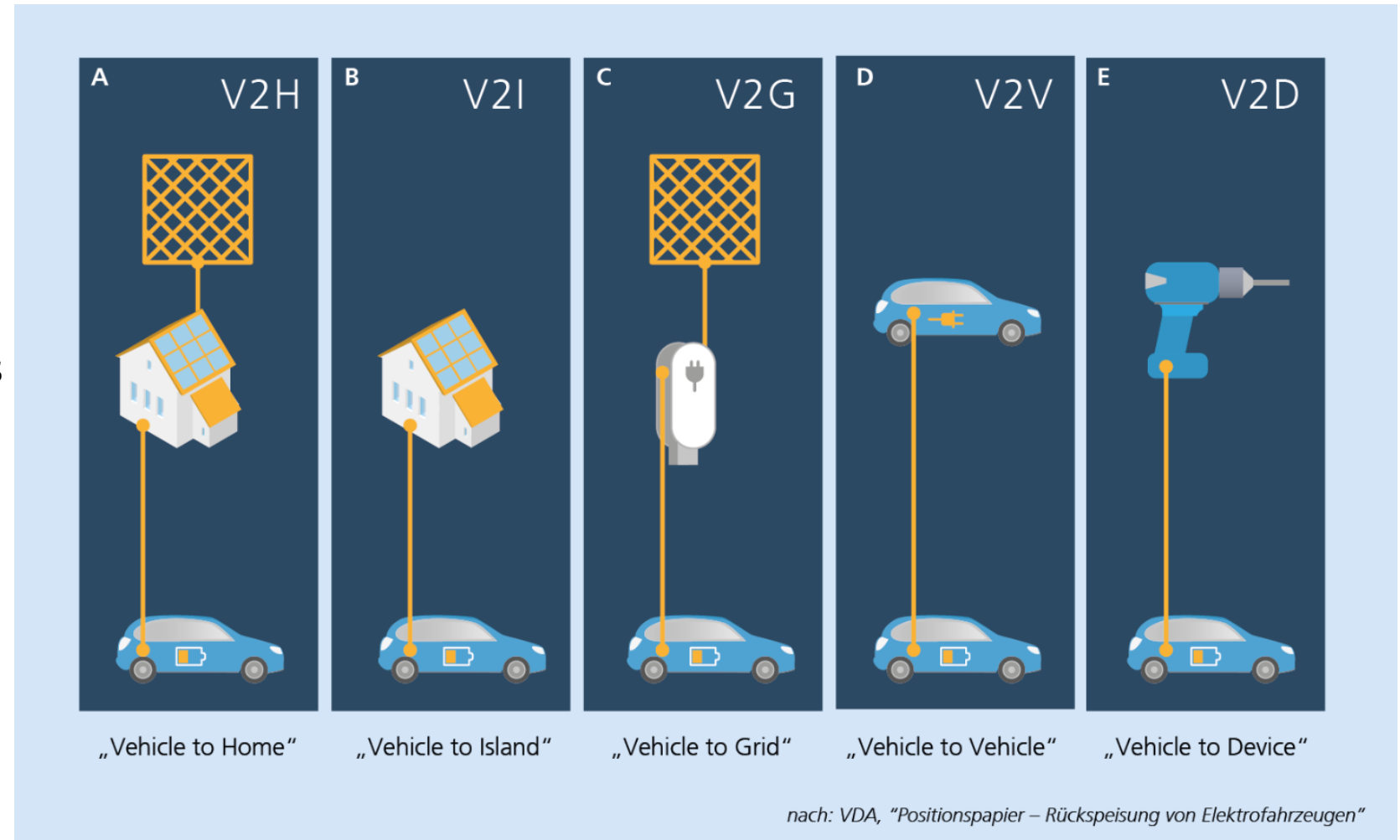
Scope of the current study

- Smart charging considering both
 - the requirements of the power system and
 - the needs of the vehicle users
- Public charging stations mainly and home charging stations to some extent
- Only unidirectional power flow



Pictures: N. Henze

- **Bi-directional charging & discharging**
 - loads supplied by EV battery
 - EV battery integrated as storage in home energy management systems
 - **Grid support** (ancillary services with power injection to grid from EV batteries)



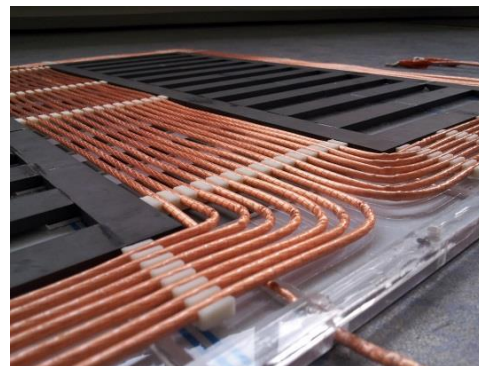
Future trends in electro mobility

(beyond the scope of the study)

■ Wireless charging



Source:
<https://www.electrive.net/2019/02/11/qualcomm-plattform-halo-kuenftig-unter-witricity-dach/>



Source: Fraunhofer IEE

■ Electric Highways – Trucks powered by overhead lines

Electric road system (ERS)



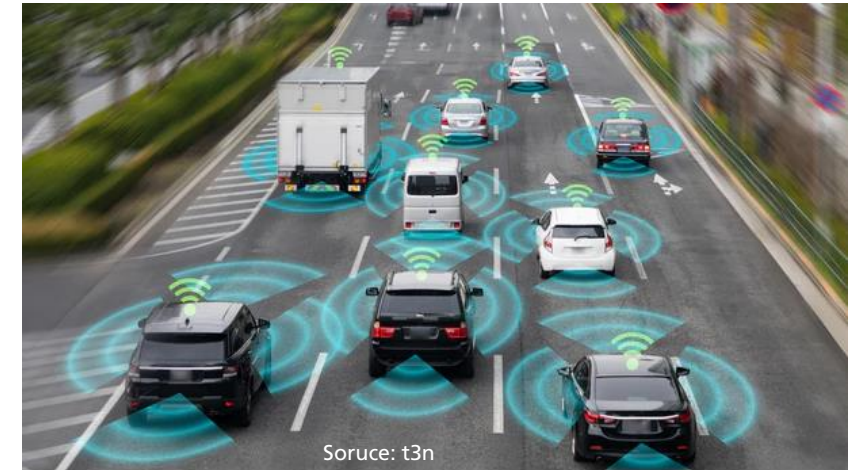
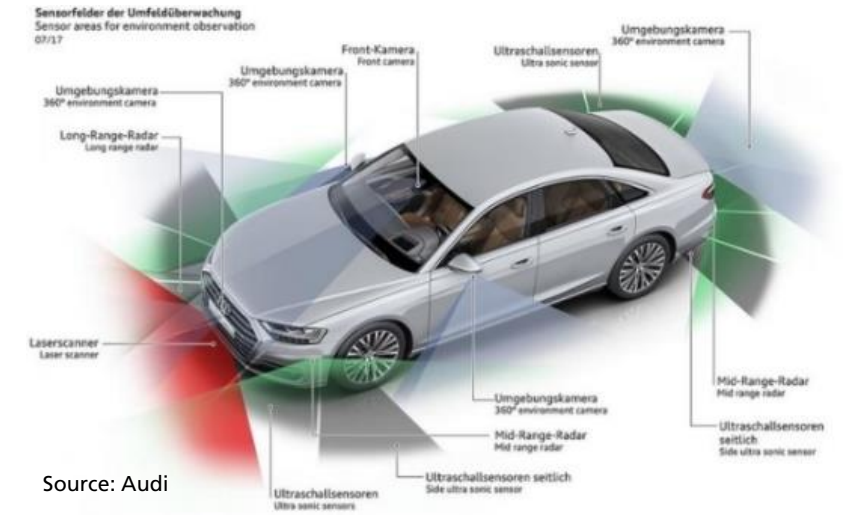
Source:
<https://www.autozeitung.de/elektro-lkw-schweden-130948.html>

Future trends in electro mobility

Artificial Intelligence

- Autonomous driving – self-driving cars
- charging schedules generated by AI taking into account
 - Battery characteristics
 - EV using periods
 - Local energy demand and generation (Smart Home)
 - Electricity tariffs etc.
 - Digital twins representing the infrastructure behavior

(beyond the scope of the study)



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Thank you for your interest and participation



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