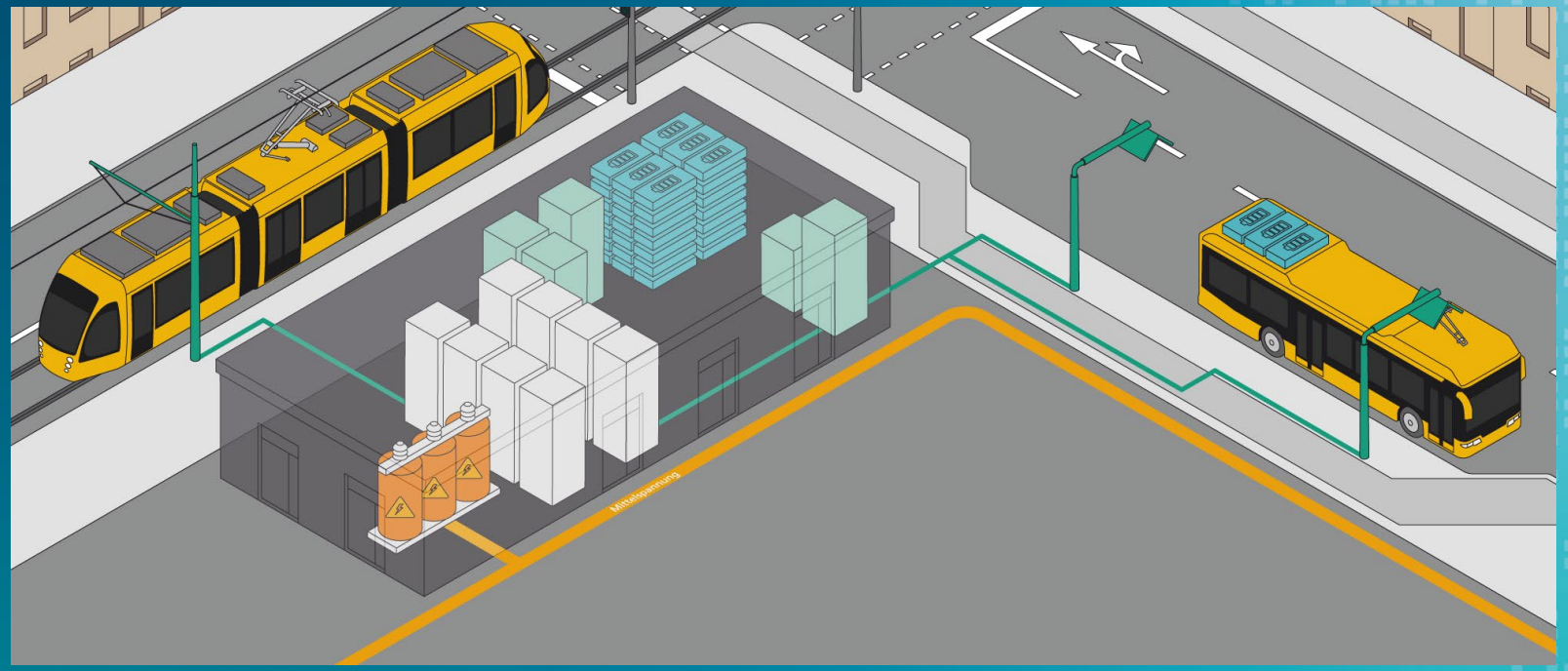


Implementing energy storage systems in public transport

Fraunhofer Institute for Transportation and Infrastructure Systems IVI

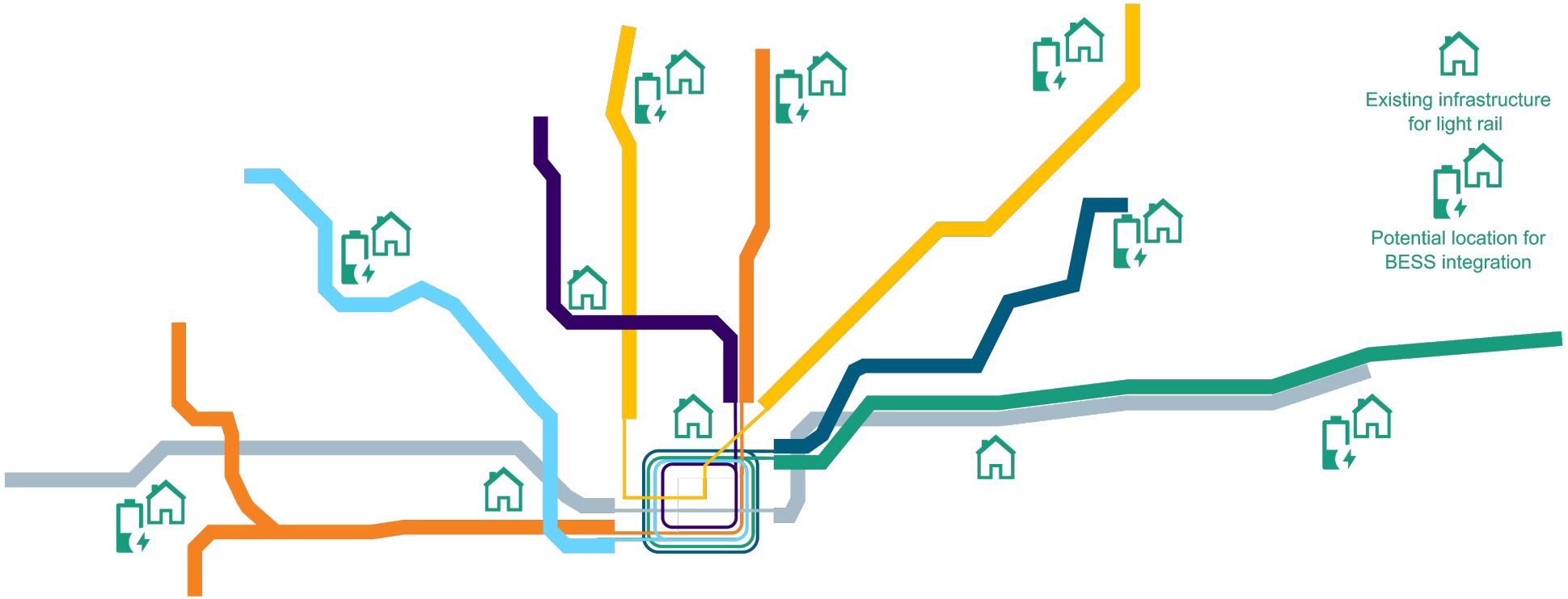
According to the EnEfG*, transport companies are required to investigate energy-saving measures and implement them if they have a positive economic effect. Battery energy storage systems (BESS) can provide a significant contribution to increasing energy efficiency given the right location within a light rail network.

Fraunhofer IVI has many years of expertise and the tools for identifying potential locations and dimensioning the associated facilities.

* Energy Efficiency Act, source: https://www.bundesregierung.de/

Implementing energy storage systems in public transport

Braking energy recuperation



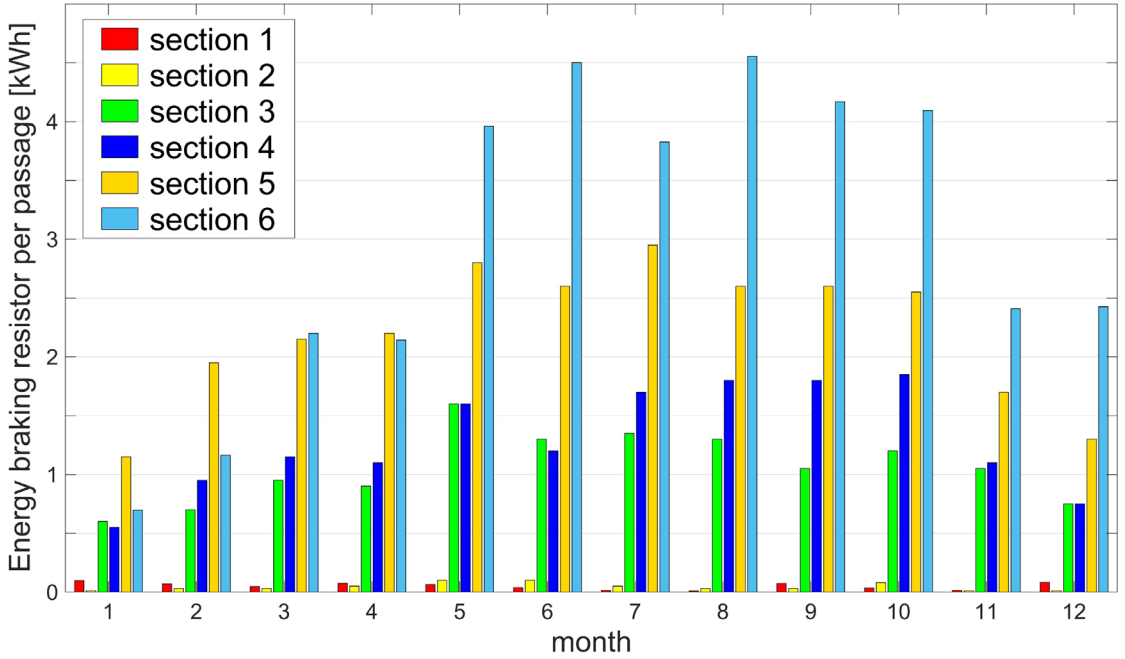
In addition to the energy exchange between vehicles, the recuperation of braking energy is possible in light rail networks with varying levels of potential. This requires the use of BESS.

Implementing energy storage systems in public transport

Braking energy recuperation

Determining potential: a service of Fraunhofer IVI

- Equipping trams with certified loggers
- Recording the site-specific recuperation potential
- Data evaluation
- Dimensioning of stationary storage systems
- Profitability analysis



Implementing energy storage systems in public transport

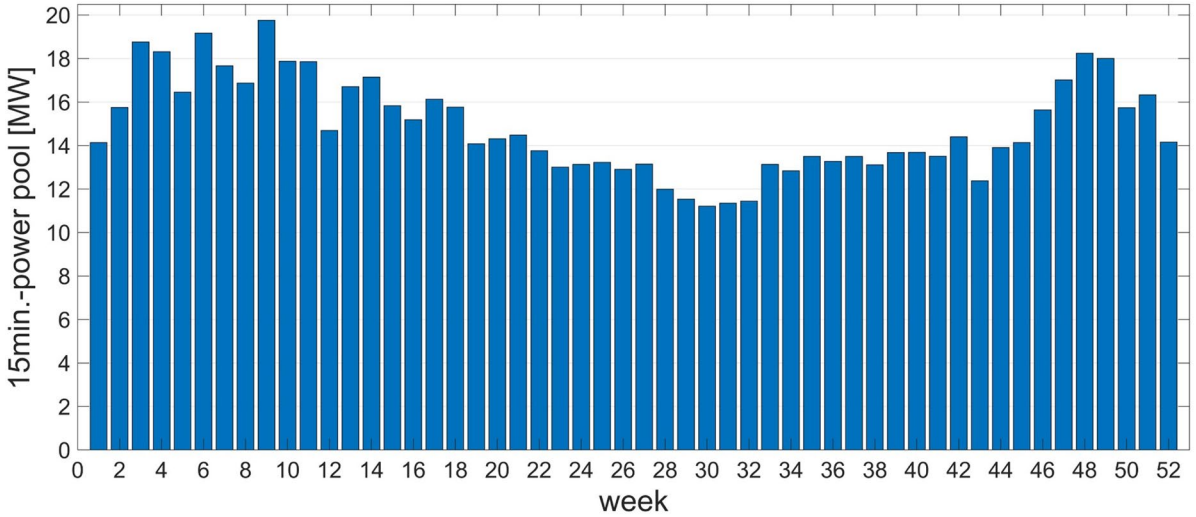
Additional amortization paths

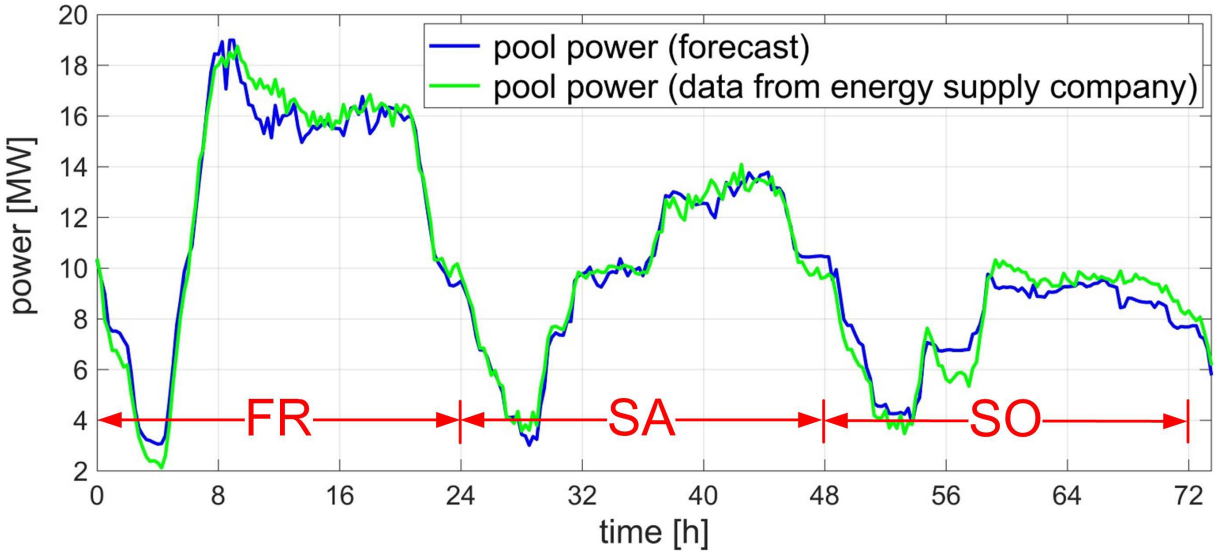
Reduction of grid charge through peak shaving

- Storage is utilized only a few days a year
- In locations with high potential for recuperation
- Prerequisite: sufficiently accurate forecast of daily loads for the following day (Fraunhofer IVI expertise)

Grid services (FCR), electricity trading

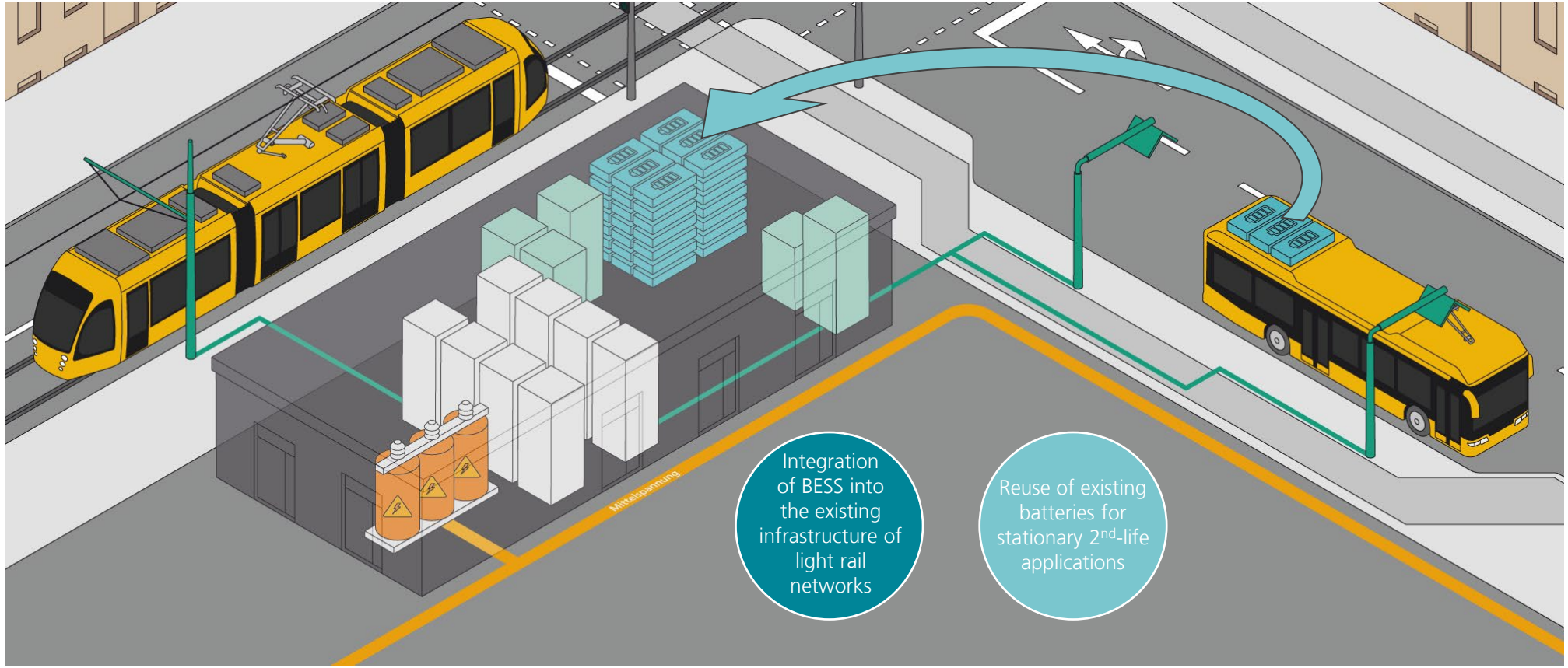
- Outside the operating periods of peak shaving and braking energy recuperation





Implementing energy storage systems in public transport

GUW+ energy supply concept



Implementing energy storage systems in public transport

Services provided by Fraunhofer IVI

Fraunhofer IVI supports BESS manufacturers and transport companies in carrying out the necessary preliminary investigations for integrating storage systems by providing services and expertise in the following:

- Site-specific determination of braking energy potential in a light rail network (equipment for measuring vehicle(s) potentials and use of own evaluation routines)
- Determining the potential for reducing the grid fee
- Dimensioning the stationary storage technology
- Evaluation of investments according to DIN 17463

References

- DVB AG, ÜSTRA AG

Thank you for your attention!

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