



reev Smart Guide

Load management and
energy storage for efficient
charging processes

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With the increasing spread of electric vehicles (EVs), the demand for high-performance charging solutions is also growing rapidly. Load management and energy storage systems play a crucial role here: they optimise charging processes, reduce the load on the power grid and promote sustainable energy use. According to the European Environment Agency, intelligent load management could reduce the grid load by up to 25 %. This white paper highlights the relevance of these technologies, shows their practical implementation and presents successful practical examples.

1. The growing importance of electromobility

The electrification of road transport is a central component of the EU's CO₂ reduction strategy. According to forecasts by the European Commission, there could be up to 40 million electric vehicles on Europe's roads by 2030. To meet this demand, over 6 million charging points would be required - there are currently only around 500,000, which is a huge challenge for the existing electricity infrastructure.

This is because conventional power grids are not designed to cope with peak loads that occur when several vehicles are charged at the same time. This can result in overloads, power outages and higher costs. The combination of intelligent load management and energy storage can provide a remedy here.



2. Functionality and types of load management systems

Energy management systems (EMS) control the distribution of the available charging power in such a way that grid overload is prevented. This is particularly important in apartment blocks, commercial properties and large charging parks. There are three main approaches:

Static load management:

The charging power is distributed evenly across all charging points.

Dynamic load management:

Distribution takes place in real time and adapts to current consumption.

Prioritised load management:

Certain users or vehicles are given priority for charging.

The advantages:

- Optimised network load distribution
- Avoidance of expensive power peaks
- Maximised use of solar power and other renewable energies

3. The role of energy storage systems in the charging process

Energy storage systems are crucial for flexibilising electricity consumption. They store surplus energy when demand is low and release it again during peak loads. According to BloombergNEF, the market for battery storage could grow to 400 GWh by 2030.

Important storage technologies:

battery storage systems (BESS)

Lithium-ion batteries are leading the way here.

Vehicle-to-grid (V2G)

Electric cars become mobile energy storage units.

The economic advantages:

- Reduced electricity costs through load shifting
- More stable power grid
- Potential revenue from the provision of balancing energy

4. Challenges and solutions

Despite the many advantages, there are a few hurdles to overcome during implementation:

- High investment costs for technology and installation
- Different regulatory requirements in Europe
- Complex integration into existing networks
- Shortage of skilled labour in the electrical engineering sector

Possible solutions:

Targeted funding programmes, standardised EU directives and comprehensive training for installers and facility managers.

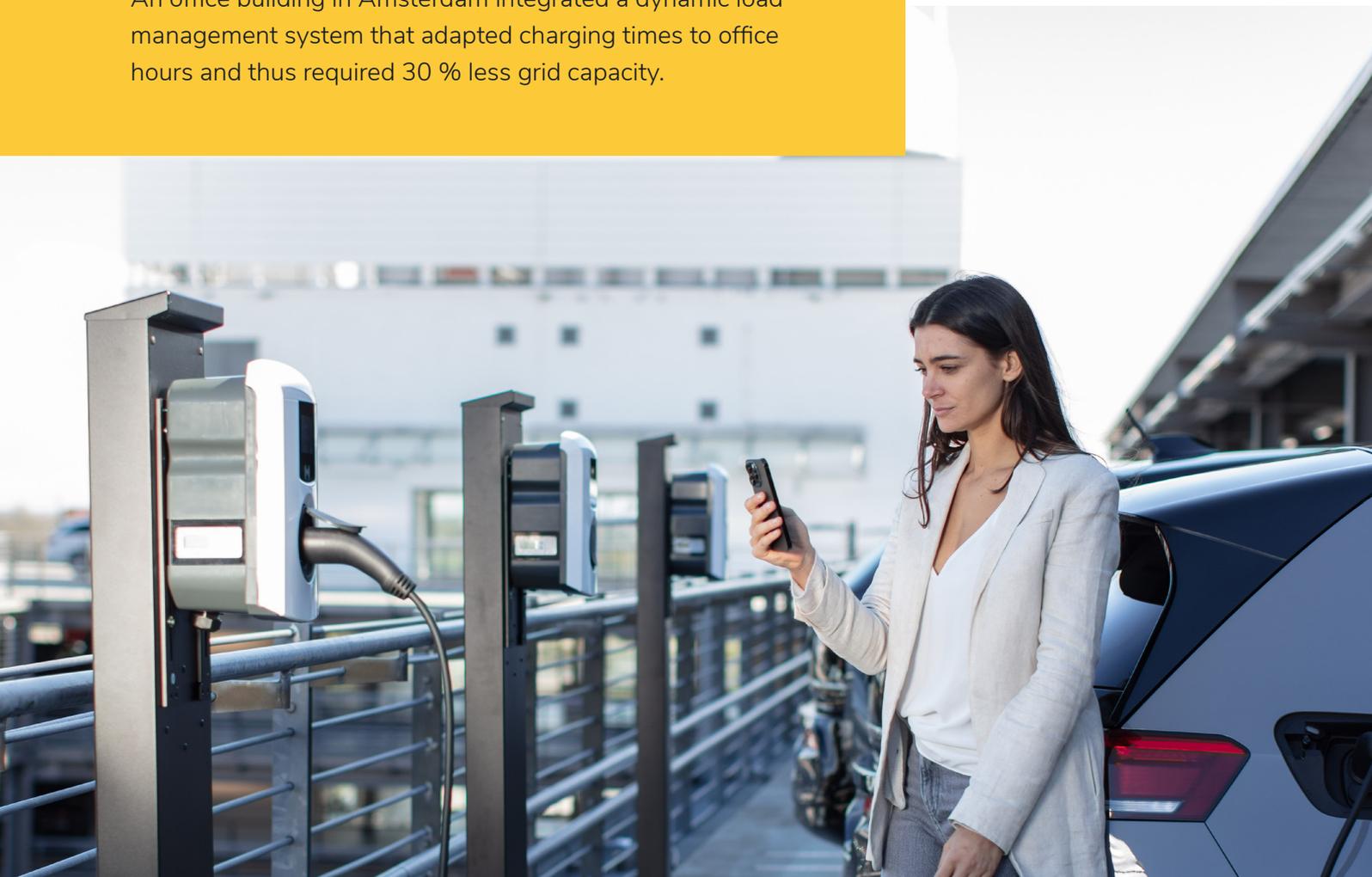
5. practical examples from everyday life:

Example 1: Residential complex in Germany

An apartment block in Berlin installed an EMS with a battery storage system, which reduced the peak load by 40 % and significantly lowered energy costs.

Example 2: Commercial property in the Netherlands

An office building in Amsterdam integrated a dynamic load management system that adapted charging times to office hours and thus required 30 % less grid capacity.



6. reev as a holistic solution

reev offers an innovative software solution for intelligent load management and seamless integration of energy storage systems. The most important advantages of reev:

- **Dynamic and static load management**
to maximise energy efficiency
- **Scalable solutions**
for residential buildings, businesses and charging parks
- **Compatibility with renewable energies**
for the sustainable use of electricity
- **Monitoring and billing systems**
for transparent energy utilisation
- **Plug-and-play integration**
with existing power grids and photovoltaic systems

7. Conclusion: Shaping the future now

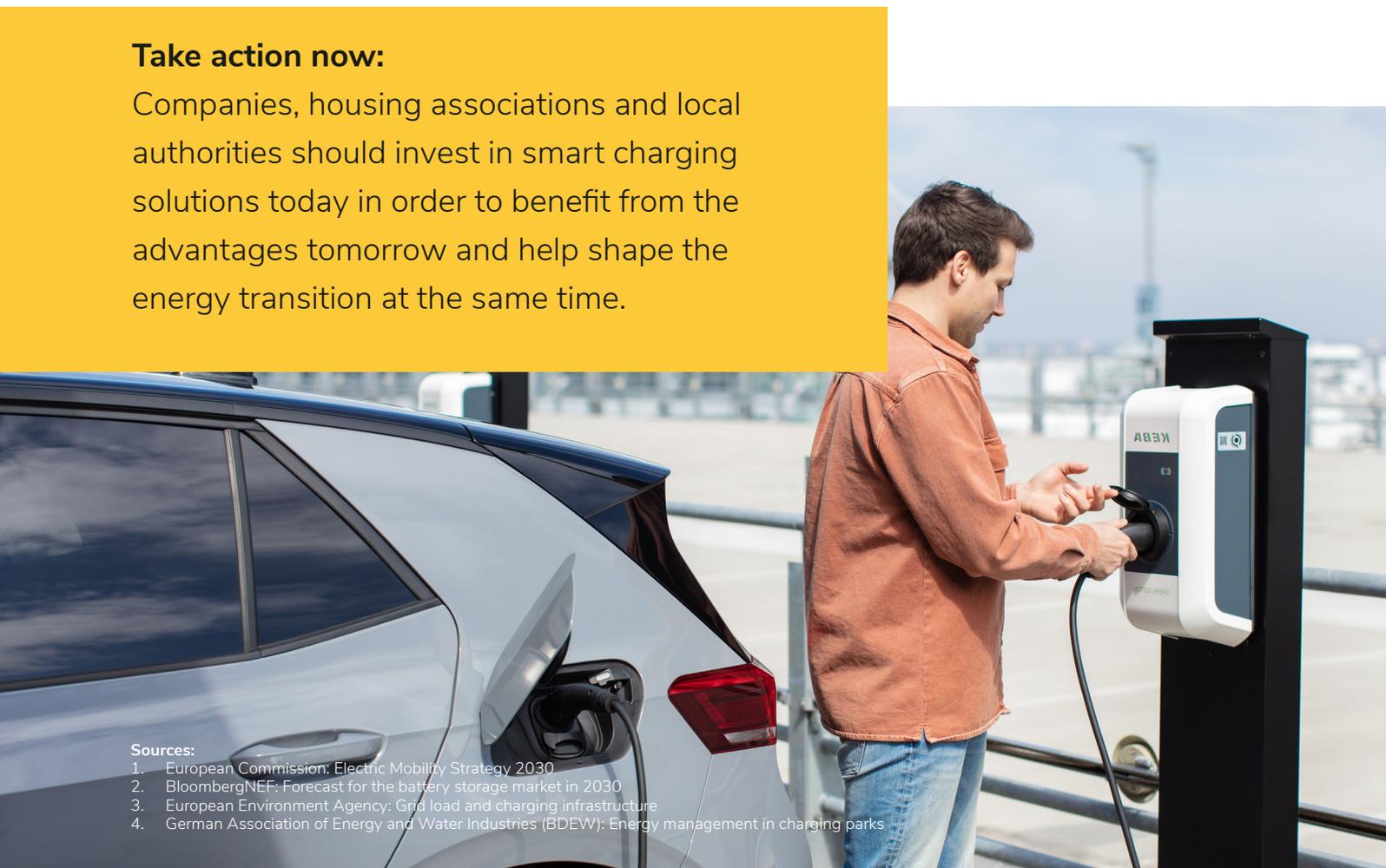
The combination of load management and energy storage is essential for a sustainable, cost-efficient charging infrastructure. Technologies such as V2G, AI-supported load management and modern battery storage systems will become increasingly important in the coming years.

Take action now:

Companies, housing associations and local authorities should invest in smart charging solutions today in order to benefit from the advantages tomorrow and help shape the energy transition at the same time.

Sources:

1. European Commission: Electric Mobility Strategy 2030
2. BloombergNEF: Forecast for the battery storage market in 2030
3. European Environment Agency: Grid load and charging infrastructure
4. German Association of Energy and Water Industries (BDEW): Energy management in charging parks



If you have any questions or require further information, we will be happy to help.

Contact us and find out how your company can benefit from intelligent charging infrastructure.

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