e-lobster

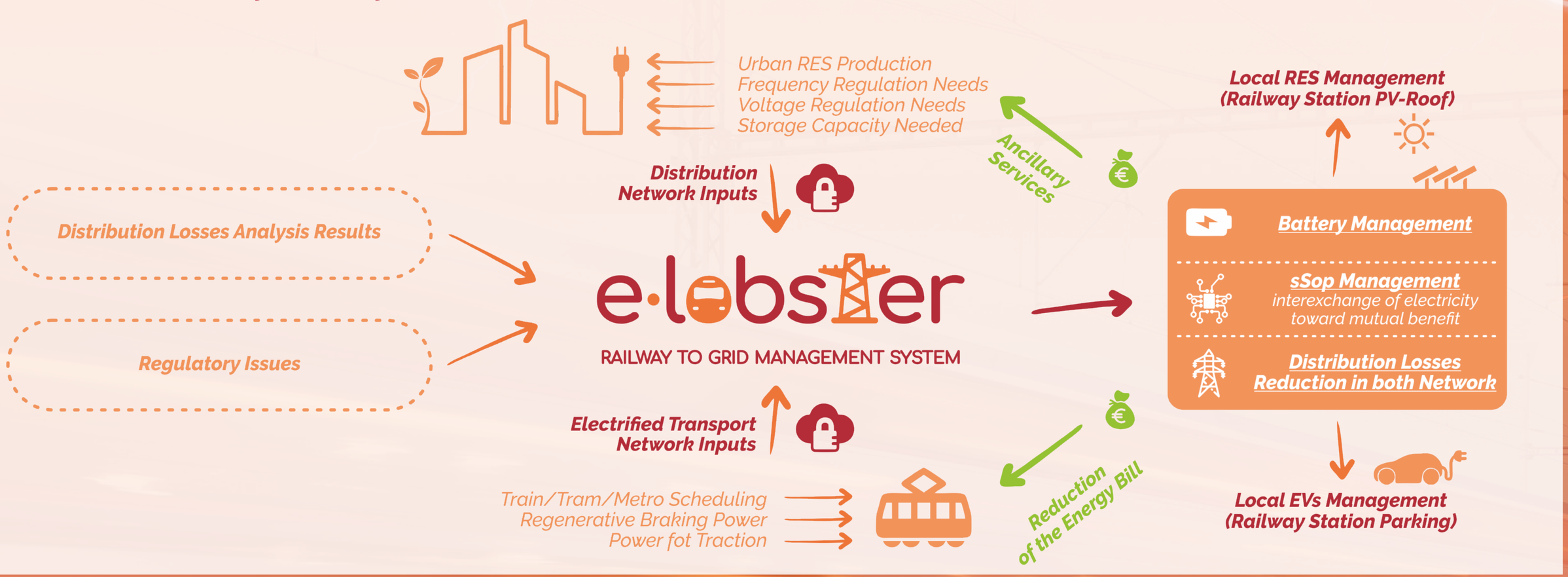
Electric LOsses Balancing through integrated STorage and power Electronics towards increased synergy between Railways and electricity distribution networks

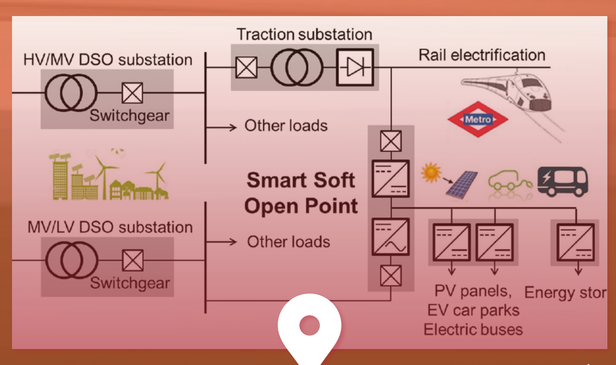
CONCEPT

European distribution networks and light-railway networks present common issues as they both have been developed as independent networks, relying on the resilience and robustness of existing power supplies. However, the progressive penetration of Renewable Energy Sources introduced an increasing degree of uncertainty on the direction of power flows and the power demand, which may have a very strong impact on the operation of distribution grids.

E-LOBSTER project is developing an innovative R+G (Railway to Grid) Management system which, combined with advanced power electronics, will be able to reduce electricity losses in both the power distribution network and the light railway network.

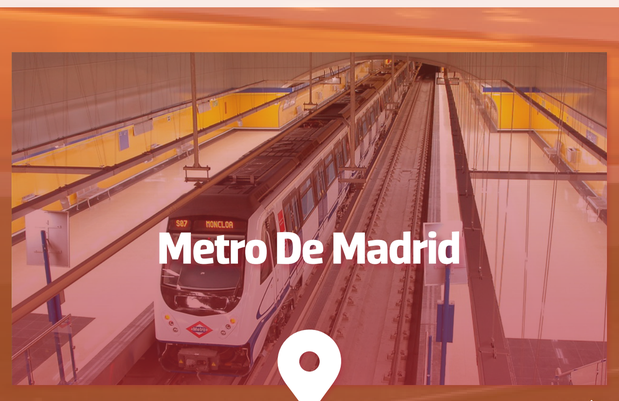
The system will be able to make the best use of the available energy on both the grids by increasing their mutual synergies and maximizing the consumption of local Renewable Energy Sources (RES) production through electric energy storages. The hardware and software control platform have been validated in the Smart Grid Laboratory of the Newcastle University and they will be demonstrated in real condition at TRL 6 in one substation of Metro de Madrid.





DESIGN

VALIDATION



DEMONSTRATION

DEPLOYMENT

OTHER CHALLENGES

Other specific challenges lie in the development and couplings of the various components (i.e. power electronics, electrical storage, EVs) which must be controlled with an efficiency-oriented approach for the minimization of distribution losses, taking into account:

- **The specific standards of these two sectors**
- **Real-time parameters from the local energy grids (e.g. electricity price, balancing requests, ancillary services, local electrical demand, risks of local shortage or problems on the quality of supply)**
- **Environmental constraints**
- **Suitable new business models are needed to foster the replication all around Europe**

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