

Policy Views of Sustainable Integrated Solution for Increased Synergy between Light Railways and Electrical Distribution Network

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Abstract : The EU has set itself a long-term goal of reducing greenhouse gas emissions by 80-95% of the 1990 levels by 2050 as set in the Energy Roadmap 2050. This paper reports on the European Union H2020 funded E-Lobster project which demonstrates tools and technologies, software and hardware in integrating the grid distribution, and the railway power systems with power electronics technologies (Smart Soft Open Point - sSOP) and local energy storage. In this context this paper describes the existing policies and regulatory frameworks of the energy market at European level with a special focus then at National level, on the countries where the members of the consortium are located, and where the demonstration activities will be implemented. By taking into account the disciplinary approach of E-Lobster, the main policy areas investigated includes electricity, energy market, energy efficiency, transport and smart cities. Energy storage will play a key role in enabling the EU to develop a low-carbon electricity system. In recent years, Energy Storage System (ESSs) are gaining importance due to emerging applications, especially electrification of the transportation sector and grid integration of volatile renewables. The need for storage systems led to ESS technologies performance improvements and significant price decline. This allows for opening a new market where ESSs can be a reliable and economical solution. One such emerging market for ESS is R+G management which will be investigated and demonstrated within E-Lobster project. The surplus of energy in one type of power system (e.g., due to metro braking) might be directly transferred to the other power system (or vice versa). However, it would usually happen at unfavourable instances when the recipient does not need additional power. Thus, the role of ESS is to enhance advantages coming from interconnection of the railway power systems and distribution grids by offering additional energy buffer. Consequently, the surplus/deficit of energy in, e.g. railway power systems, is not to be immediately transferred to/from the distribution grid but it could be stored and used when it is really needed. This will assure better energy management exchange between the railway power systems and distribution grids and lead to more efficient loss reduction. In this framework, to identify the existing policies and regulatory frameworks is crucial for the project activities and for the future development of business models for the E-Lobster solutions. The projections carried out by the European Commission, the Member States and stakeholders and their analysis indicated some trends, challenges, opportunities and structural changes needed to design the policy measures to provide the appropriate framework for investors. This study will be used as reference for the discussion in the envisaged workshops with stakeholders (DSOs and Transport Managers) in the E-Lobster project.

Keywords : light railway, electrical distribution network, Electrical Energy Storage, policy

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