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Policy brief: Clean fuels and vehicles

Cleaner fuels and vehicles decrease local air pollution and greenhouse gas emissions, which in turn help improve quality of life for citizens. CIVITAS cities seek to explore innovations in these fields and share best practices.

The European Commission's 'Clean Vehicles Directive[1] (2009/33/EC)', which was adopted in April 2019, aims to promote clean mobility solutions in public procurement tenders and thereby raise the demand for, and the further deployment of, clean vehicles.

Photo credit: Stadtwerke Oberhausen

The proposal provides a definition for clean light-duty vehicles based on a combined CO2 and air-pollutant emissions threshold; for heavy-duty vehicles, it gives a definition based on alternative fuels. This is in line with the EC's energy union package, which plans action on the further decarbonisation of road transport in line with the 2030 climate and energy targets.

The ELIPTIC project[2], which finished in May 2018, aimed to develop new concepts and business cases to optimise existing electric public transport infrastructure and rolling stock, saving both money and energy. The project strengthened the role of electric public transport, leading to reduced fossil fuel consumption and improved air quality.

ELIPTIC focused on the use of existing electric public transport systems (including light rail, metros, trams and trolleybuses) for the electrification of multimodal mobility systems in urban, suburban, and a few more rural contexts.

The overall concept and main assumption underpinning ELIPTIC was that some of the financial costs linked with measures to accelerate electric vehicle take-up could be offset by interlinking the electricity grid used for public transport with the one for general public supply.

To achieve this goal, ELIPTIC analysed 20 concepts within 11 cities. These were Barcelona (Spain), Bremen (Germany), Brussels (Belgium), Eberswalde (Germany), Gdynia (Poland), Lanciano (Italy), Leipzig (Germany), London (UK), Oberhausen (Germany), Szeged (Hungary), and Warsaw (Poland).

[1] https://ec.europa.eu/transport/themes/urban/vhicles/directive_en
[2] www.eliptic-project.eu

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Policy recommendations

Interlinking the public electricity grid with the public transport operators grid

ELIPTIC suggests that existing public transport electric infrastructure could be used to support the next wave of transport electrification for both public and private users. However, reaching full electrification will require the integration of public electricity grids and those used by public transport operators.

Smarter grids and effective energy storage options will become central to designing future power systems for public transport. Innovative solutions that continuously monitor performance will allow operators to manage more than one grid, for example the public distribution grid in addition to their own.

Increasingly, operators of (electrified) public transport modes are becoming managers of electric grids and energy systems as well. Ideally, these interlink with the existing networks of other providers, as the success of shifting to such renewable energy sources relies upon increased grid capacity and flexibility.

However, this new role changes the scope of public transport provision and involves legislation and regulation that allows public transport operators to do so, whilst also ensuring equal access to the grid and other requirements to maintain network neutrality. Action should be taken to adapt existing regulatory frameworks to allow for the employment of new technical concepts that can drive the electrification of public transport.

Examples from the use cases include the restriction of distributing (commercially or otherwise) energy from the public transport grid (often itself subsidised) to third parties. As such, most cities are not allowed to provide grid access to taxis, vehicles used for public utilities (such as street cleaning), private individuals and commercial fleet operators.

Relaxing some regulations could help operators implement new technological solutions that ease the operation of their own electric vehicles, whilst also optimising power demand.

Extend the role of public transport operators

Currently, energy legislation focuses on the generation, consumption and transport of energy. However, the increasing share of renewable energy requires adequate governance mechanisms that incorporate the storage of energy and reverse flows, such as the recuperation of braking power.

Interlinking the grid used for public transport with that for general public supply will require the definition of the requirements for measuring electrical energy generated and consumed, as well as specific duties to report and inform. This might require a change in stakeholder understanding, as public transport companies will broaden their market towards generating and selling electricity.

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To support the development of future technologies in the fields of renewable energy supply, energy storage and electro-mobility, it is essential to provide **a coherent regulatory framework for the interface between the transport and (electrical) energy sectors.**

A cohesive and administratively "leaner" legal framework would be needed to facilitate decentralised generation and the sale of electrical energy. This would also help address the inconsistencies and uncertainties that hinder public transport companies from developing innovative electro-mobility concepts, including reselling energy to third parties.

Create a level playing field for all market actors

To encourage the implementation of innovative electro-mobility concepts, future regulations need to avoid putting at risk the benefits that public transport companies have enjoyed, such as subsidies and favourable tax rates.

Ideally, the process of interlinking grids would not involve additional administrative burdens or legal uncertainties. Otherwise, policies may end up having the opposite effect of that intended, as economic and legal risks exceed the benefits.

Due to the wide variety of market actors in public transport, the legal framework for increasing the electrification of public transport (inclusive of public road transport) has to be clear and straightforward.

Create a level playing field for all types of new technology

New technologies for generating and consuming electrical energy, alongside their new areas of application like electro-mobility and energy storage and recovery, have to be considered separately in the legal framework according to their function and special properties.

Operators of electric public transport modes are increasingly becoming the managers of their electric grid and their energy systems. With electric vehicles assuming a larger share of public transport trips, the operator's role in providing access to its grid will require further specialisation in and knowledge of this role, as well as the permission to do so.

It is particularly important to avoid legal uncertainties concerning single power generation and consumption events (peaks) in the legal framework for the electrical energy system.

This requires defining whether special duties (e.g. duties to measure, inform, report or pay levies) can or cannot be applied to the single technologies or procedures (e.g. by defining explicit exemptions for certain market actors from specific duties or by using clear terms and definitions).

The **increasing interactions between the transport and electrical energy sectors should also be considered reflected in the regulations governing electric grids** so that practical and appropriate solutions can develop on the market.

It is especially important to try and offer attractive marketing options for electrical energy fed back into public electrical grids by traction power supply systems. Such options promote

the meaningful use of recaptured energy and increase the utilisation of potential energy from traction power supply systems.

Tools and publications

In the document

- ELIPTIC Policy Recommendations, link

Further resources

- ELIPTIC Use Cases Brochure, link
- ELIPTIC D4.2 - Final Business Cases, link
- Electrification of Public Transport Toolbox, link