

The 6th Vienna Forum on European Energy Law

Electromobility

A Legal and Economic Perspective

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Foundation for Environmental Energy Law

www.stiftung-umweltenergierecht.de



CONTENT

Content

- **Decarbonisation of transport sector and electromobility**
- **Latest developments of electromobility in Europe**
- **National incentives for the purchase of electric vehicles and deployment of infrastructure**
- **Electromobility in the *Clean energy* package**
- **What is the European Battery Alliance?**



DECARBONISATION OF TRANSPORT SECTOR AND ELECTROMOBILITY

Electromobility and the decarbonisation of transport

- An **energy-efficient and decarbonised transport sector** is one of the objectives of the **Energy Union** (Transport represents more than 30% of final energy consumption in the EU)
- **COM: Clean power for Transport, COM(2013) 17 final**
→ *"No single fuel solution"*

Fuel	Mode	Road-passenger			Road-freight			Air	Rail	Water		
		short	medium	long	short	medium	long			inland	short-sea	maritime
LPG												
Natural Gas	LNG											
	CNG											
Electricity												
Biofuels (liquid)												
Hydrogen												

Table 1: Coverage of transport modes and travel range by the main alternative fuels

- **COM: European Strategy for Low Emission Mobility, SWD(2016) 244**
→ *"Electro-mobility [...] an important element of the energy transition"*

Challenge: To develop a consistent framework to connect ...

- **... mobility issues related to the electrification of transport ...**
 - **Incentivizing** market up-take of electric vehicles, bringing down the **costs** for **batteries** and enhancing their **range**.
 - **Mobilizing** development and deployment of the necessary **infrastructure**.
- **... with electricity issues ...**
 - Electromobility will create **more demand for electricity** (at least if additional demand is not levelized by higher energy efficiency).
 - Establishing electromobility as an **integral part of the electricity system**.
 - RES share of 50 % of total electricity consumption by 2030: Need to **use growing flexibility of supply and demand**.
- **... and industry policy issues.**
 - E.g. *European Battery Alliance*

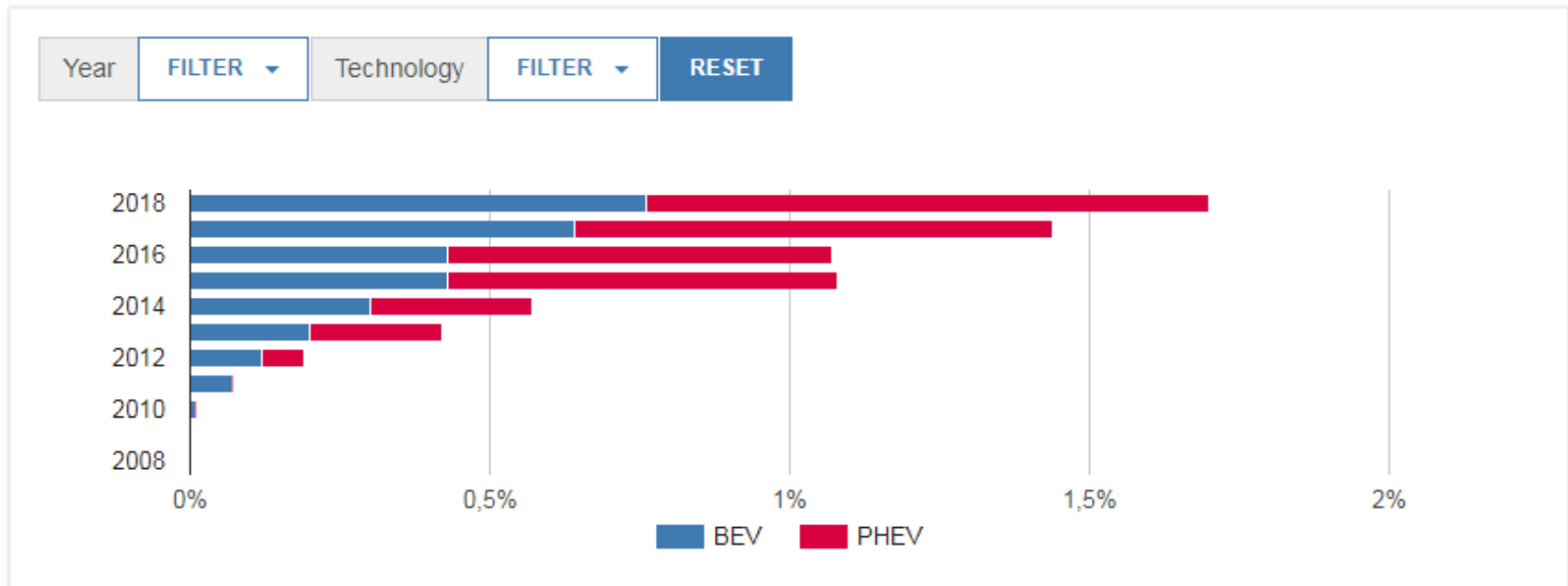


LATEST DEVELOPMENTS OF ELECTROMOBILITY IN EUROPE

Statistics on electric vehicle market share

Source: European Alternative fuel observatory, www.eafo.eu/

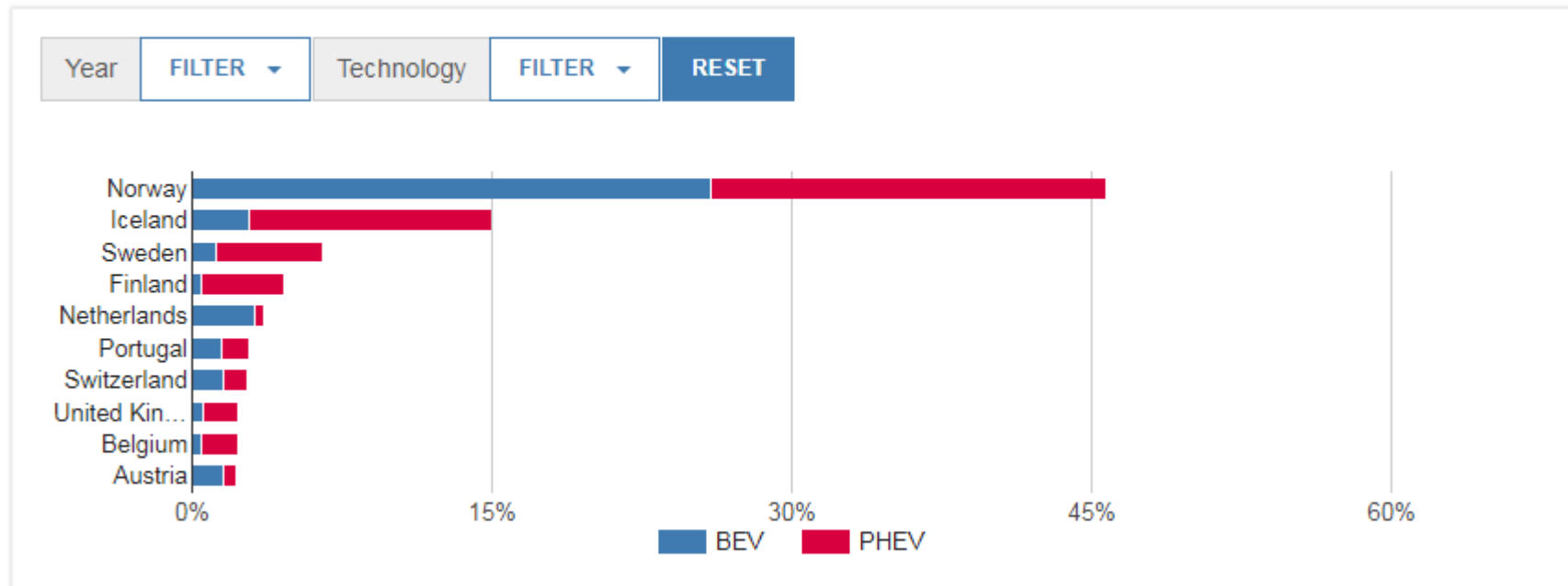
PEV (M1) market share in the European Union



Statistics on electric vehicle market share (II)

Source: European Alternative fuel observatory, www.eafo.eu/

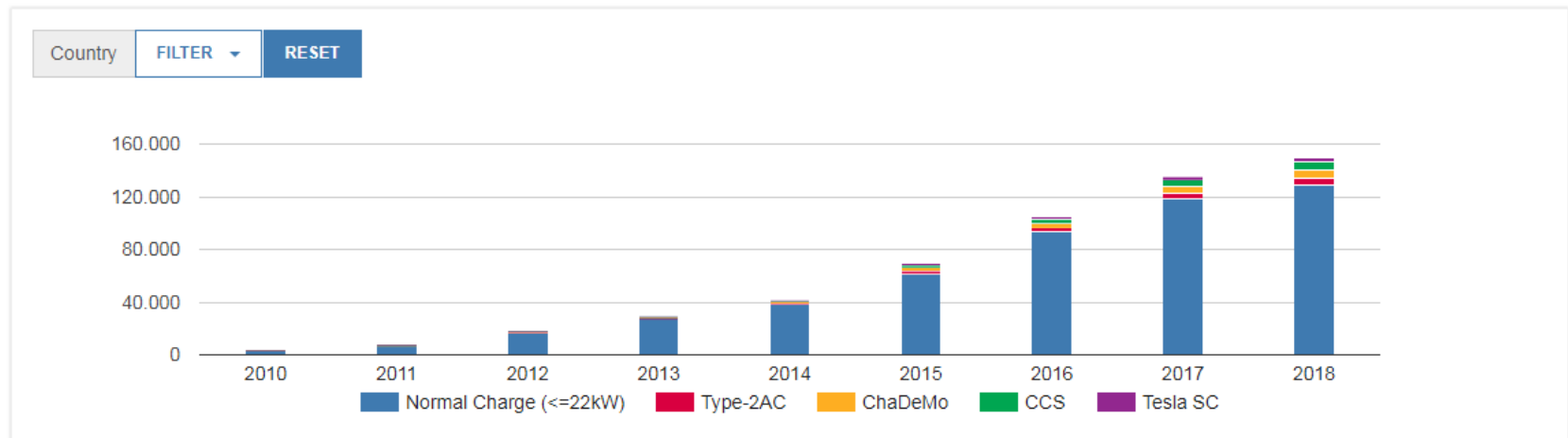
Top 10 PEV (M1) market share Countries in Europe



Statistics on electric vehicle infrastructure

Source: European Alternative fuel observatory, www.eafo.eu/

 Total number of PEV charging positions





NATIONAL INCENTIVES FOR THE PURCHASE OF ELECTRIC VEHICLES AND DEPLOYMENT OF INFRASTRUCTURE

Incentivizing and mobilizing on national level

- **Clean Vehicles Directive 2009/33/EC** (in review)
- **Directive 2014/94/EC on deployment of alternative fuels infrastructure:** *“appropriate number of recharging points accessible to the public are put in place by 31 December 2020”*
- **Direct incentives in 33 countries (EU-MS + EFTA + Turkey)**

Category of Incentives	Number of countries
Direct Purchase Subsidies	18
Tax incentives, inter alia ...	
... <i>Ownership Tax Benefits</i>	24
... <i>VAT Benefits</i>	4
Local Incentives	15
Infrastructure Incentives	10

Source: www.eafo.eu/incentives-legislation

Example: German support and State Aid law issues

- **Incentives for using electric vehicles in Germany**
 - **Purchase grant** (environmental bonus), paid towards new vehicles; total funding is limited to 1.2bn €
 - **State aid:** On 16 June 2016, COM confirmed that the environmental bonus poses no state aid issues and can be fully implemented.
- **Funding Guidelines for Electric Vehicle Charging Infrastructure**
 - Measure promotes installation of **charging points** (€300 Million)
 - Eligibility condition: **electricity required for the charging process must come from RES (also from self-generated RES on site)**
 - Confirmed: COM, SA.46574 (2016/N), based on **Art. 107 para. 3 (c) TFEU**
- **Incentives for acquisition of electric buses for public transport**
 - Project-specific non-repayable investment grant (150 buses, €70 Million)
 - Confirmed: COM, SA.48190 (2017/N), based on **EEAG**



ELECTROMOBILITY IN THE CLEAN ENERGY PACKAGE

Infrastructure and use of renewable electricity

- **Art. 8 para. 2 Energy performance of buildings directive (EPBD):**
 - Obligation to install **recharging points** and **pre-cabling** for later installation of more recharging points
 - Different requirements for (1) **non-residential** or **residential** buildings and (2) **new/renovated** or **existing** buildings
 - Exemptions foreseen for **SMEs** and certain **cost thresholds**.
- **Renewable Energy Directive (RED II):**
 - **Art. 21 para. 1:** Renewable **self-consumers**, individually or through aggregators, are entitled to generate renewable electricity, including for their **own consumption, store or sell** their excess production [...]
 - **Art. 25 para. 1:** Share of renewable electricity **shall** be considered to be **four times** its energy content when supplied to the **road transport** sector and **may** be considered to be **1,5 times** its energy content when supplied to the **rail transport sector**.

IEM Directive (still in Trialogue)

- **Art. 32 para. 2: Tasks of DSOs in the use of flexibility**
 - **Network development plan** shall contain the planned investments [...] with particular emphasis on the main distribution infrastructure which is required in order to connect new generation capacity and **new loads including re-charging points for electric vehicles.**
- **Art. 33 para. 1: Integration of electro-mobility into electricity network**
 - Regulatory framework to facilitate the **connection of** publicly accessible and private **recharging points to the distribution networks.**
 - DSOs have to cooperate on a non-discriminatory basis with any undertaking that owns, develops, operates or manages **recharging points** for electric vehicles, including **connection to the grid.**



WHAT IS THE EUROPEAN BATTERY ALLIANCE?

COM strategy to develop battery 'ecosystem' in Europe

- **COM:** Europe could capture a battery market of up to **€250 billion a year from 2025 onwards**. Covering the EU demand alone requires at least 10 to 20 'gigafactories'.
- EU battery 'ecosystem' **aims to:**
 - secure access to **raw materials** for batteries.
 - support a full **competitive value chain** in Europe.
 - strengthen **industrial leadership** and a **highly skilled workforce**.
 - support the **sustainability** of EU battery cell manufacturing industry.
 - ensure **consistency** with broader EU regulatory and enabling framework.
- **COM** is promoting a **cross-border and integrated European approach** and developing with interested EU countries, EIB, industrial stakeholders and innovation actors **key actions** to achieve the objectives of the *European Battery Alliance*.

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At a glance: My CV

Fabian Pause, LL.M. Eur.



- **1995-2001**

Law studies, Universities of Würzburg and Madrid (UAM)

- **2003-2007**

Rechtsanwalt (Lawyer) in Law firm, Würzburg

- **2007-2011**

Research Associate, Research Centre for Environmental Energy Law, University of Würzburg; Master in European Law

- **Since 2011**

Vice-Chairman of the Foundation Board and Head of Department

Stiftung Umweltenergierecht - Foundation for Environmental Energy Law

At a glance: Foundation for Environmental Energy Law

- **1st of March 2011**: Founding date of the Foundation
- Non-profit, independent and non-university research institution
- Our guiding question:
 - How do we have to change the legal framework in order to achieve the energy and climate policy objectives?**
- Four **research clusters** with mutual interactions:
 - Renewable Energies and Energy Industry Law
 - Energy Efficiency and Reduction Law
 - Energy Installations and Infrastructure Law
 - European and International Environmental Energy Law and Comparative Law
- **18 legal experts** working on diverse research projects (financed by public research grants, public research contracts and donations)
- Budget in 2017: 1.3 Mio €

Glossary

- **PEV = Plug-in electric vehicle**

Any motor vehicle that can be recharged from an external source of electricity, such as wall sockets, and the electricity stored in the rechargeable battery packs drives or contributes to drive the wheels.

- **BEV = Battery electric vehicle**

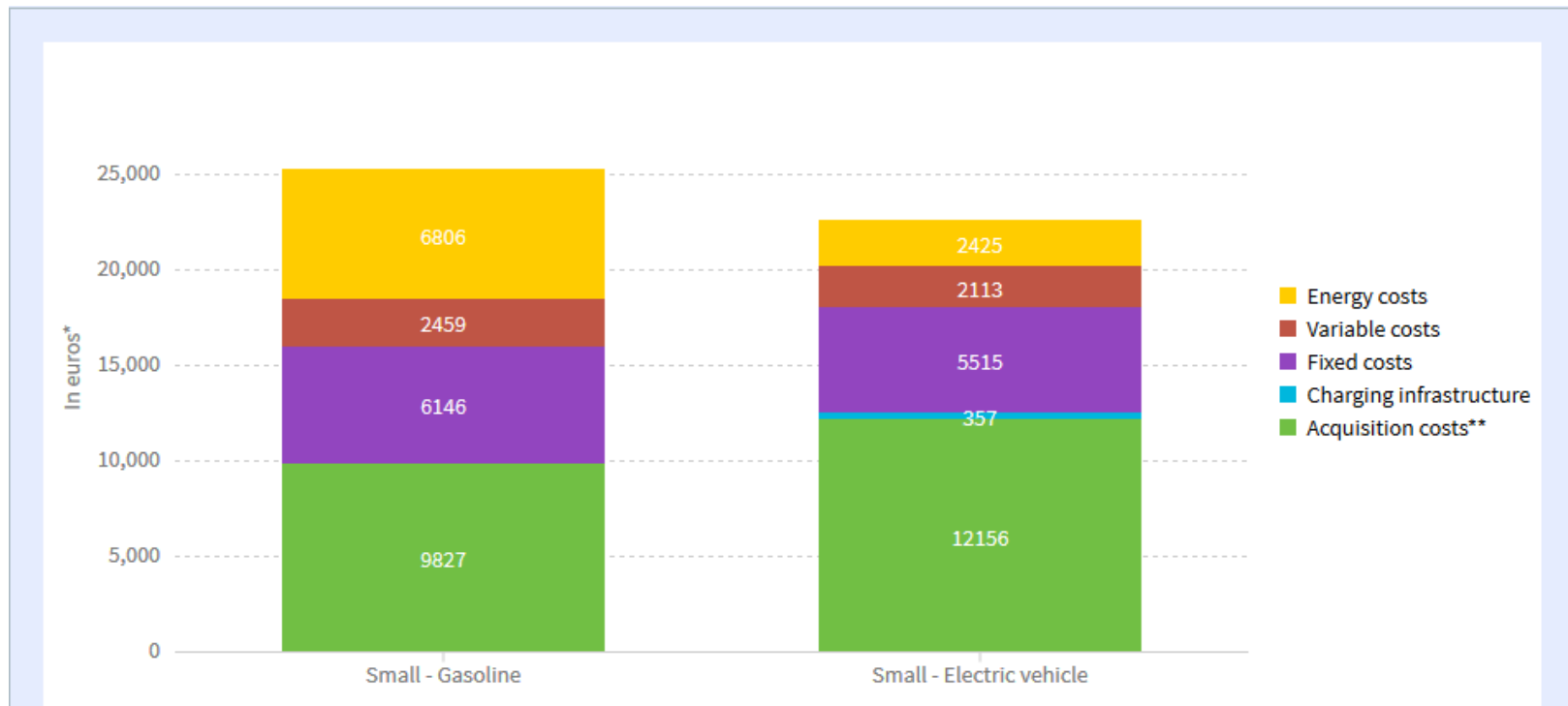
Also known as all-electric vehicle, BEV's has all its power from its battery packs and thus has no internal combustion engine, fuel cell, or fuel tank.

- **PHEV = Plug-in hybrid electric vehicle**

PHEV shares the characteristics of both a conventional hybrid electric vehicle, having an electric motor and an internal combustion engine (ICE), and of an all-electric vehicle, having a plug to connect to the electrical grid.

Source: <http://www.eafo.eu/content/glossary>

Example: Small car in the city



This graph shows the breakdown of the cost positions for a vehicle.





* Discounted to the year of acquisition.

** Acquisition costs - residual value - subsidy

Source: <http://emob-kostenrechner.oeko.de/#/>

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Example: Small car in the city

Overall results	 Small - Gasoline	 Small - Electric vehicle
Total cost of ownership	25,239€	22,566€
CO ₂ emissions (use phase)	13.832t CO ₂	4.094t CO ₂
The CO ₂ values refer to the current electricity mix in Germany.		
Details	 Small - Gasoline	 Small - Electric vehicle
Basis price of vehicle	12,279€	21,194€
Direct subsidy	0€	-4,000€
Charging infrastructure	0€	357€
Energy costs	6,806€	2,425€
Lubricant	149€	0€
Maintenance	2,310€	2,113€
Main inspection and exhaust analysis	348€	209€
Insurance	5,306€	5,306€
Vehicle tax	492€	0€
Residual value	-2,452€	-5,038€

Source: <http://emob-kostenrechner.oeko.de/#/>

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