I-CVUE

Incentives for cleaner vehicles in urban Europe


FIER
Automotive
IRU
PROJECTS
energy
saving
trust
EVU
DLR
RACC
Transport
for London
BOSCH
Coventry
University
AUSTRIAN ENERGY AGENCY

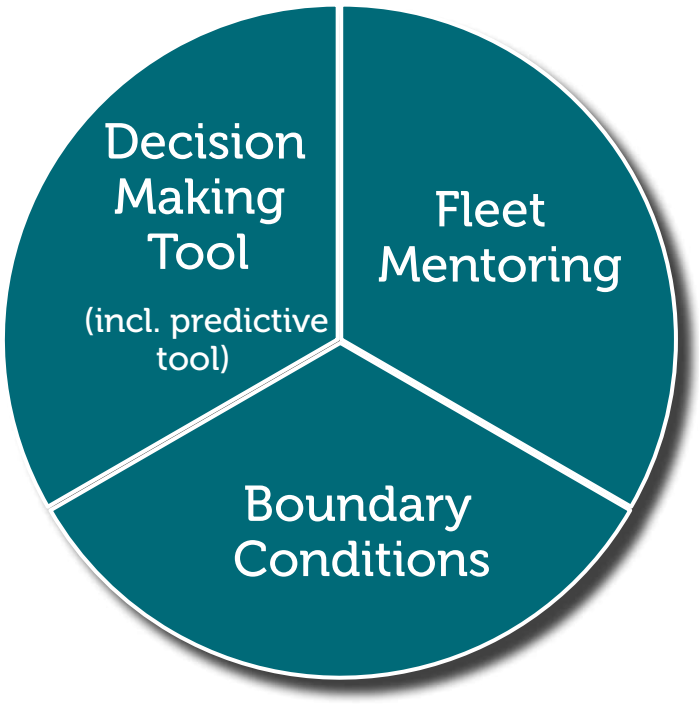
Our ambitions

Aim

- Support the uptake of plug-in vehicles across Europe
- Reduce CO2 & other hazardous emissions in urban environments
- Increasing the number of electric vehicles in fleets

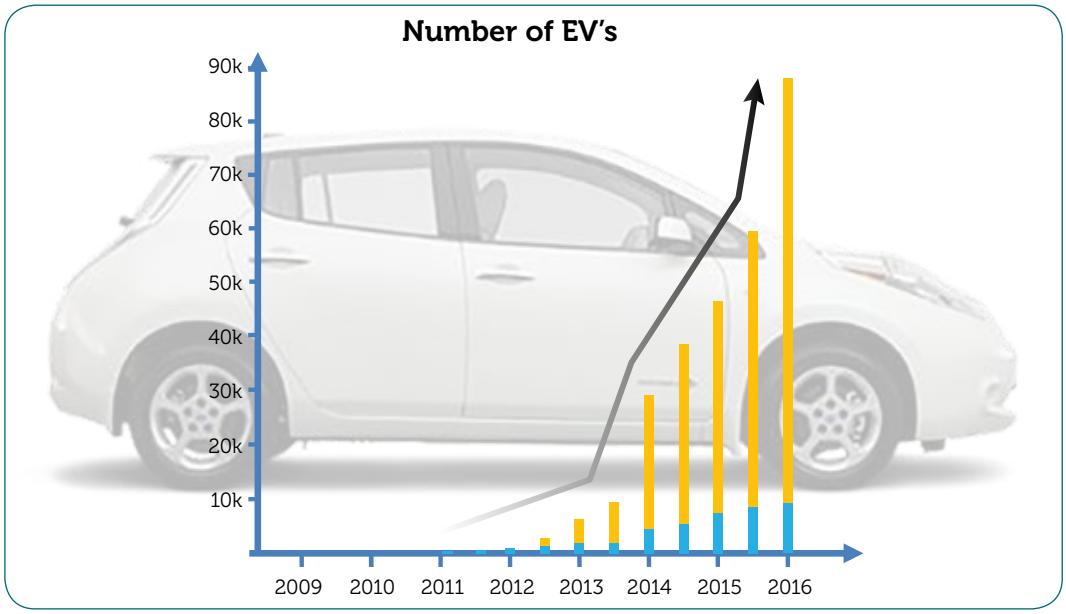
Specific objectives

- **1,000 vehicles**: The main objective is to replace 1,000 traditionally fueled vehicles with electric vehicles (EVs)
- **Business cases for fleets**: will be identified by whole life cost analysis along with emission data and information on the expected commercial benefit of substituting traditionally fueled vehicles with their electric counterpart.
- **Regional authority support**: a framework to set up incentive programs according to the specific socio-economic conditions of the city, region or country
- **Decision Making Tool**: Make knowledge usable for policymakers and fleet operators through a web based tool and dissemination of results, with 500 users at the end of the project.

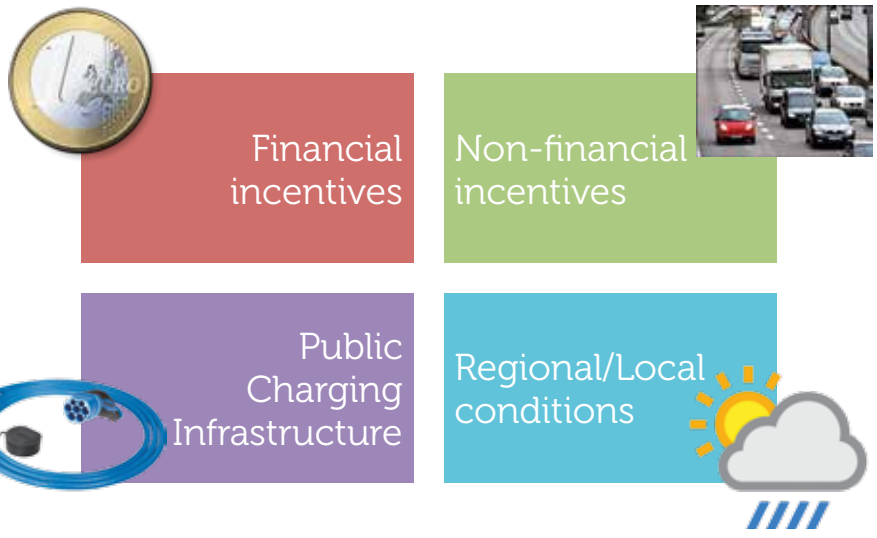


The Boundary Conditions studied

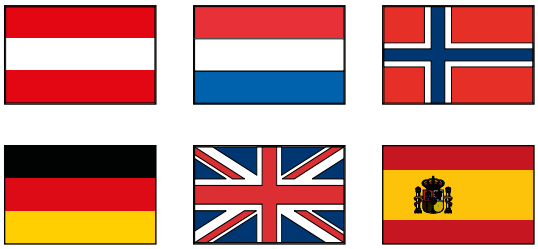
Success of EV uptake



Boundary conditions

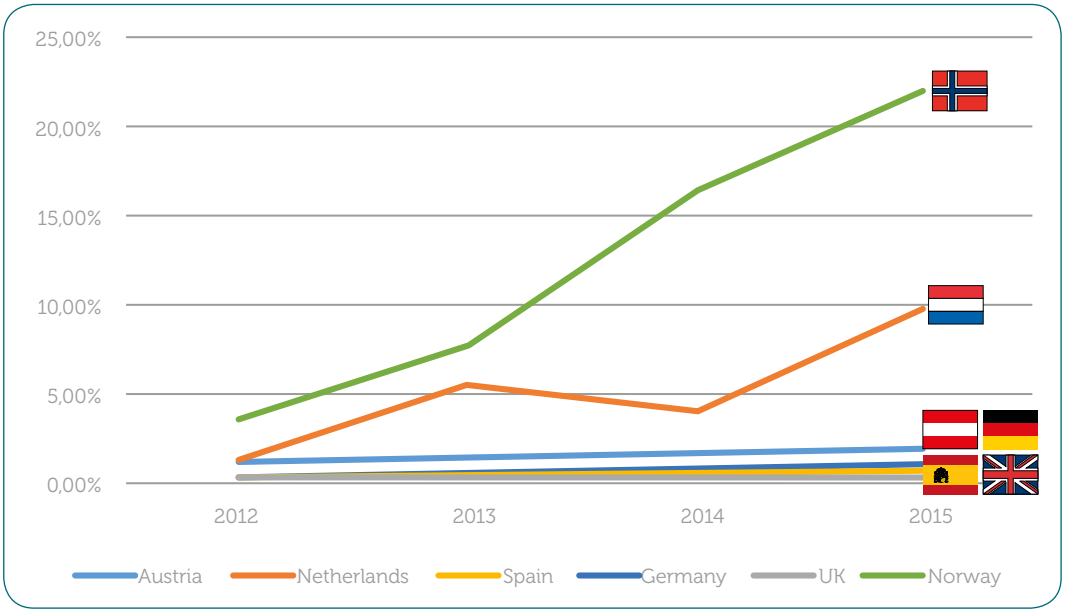


The analysis of the boundary conditions is focused on the relationships between the success of EV uptake and the boundary conditions within each country and the selected regions



Success of EV uptake

Percentages of sales of BEV/FEV and PHEV/E-REV of the total vehicle sales per country



Source: I-CVUE, analysis 2014-2016

Different financial incentives

Financial incentives:

Purchase-related measures such as (national level)

- Purchase Subsidies
- Reduced purchase tax (including VAT / purchase tax etc.)
- Other measures (like reducing the profit tax)

Operational-related measures for owners

- Reduction or exemption from road tax

Taxation for private usage of company car

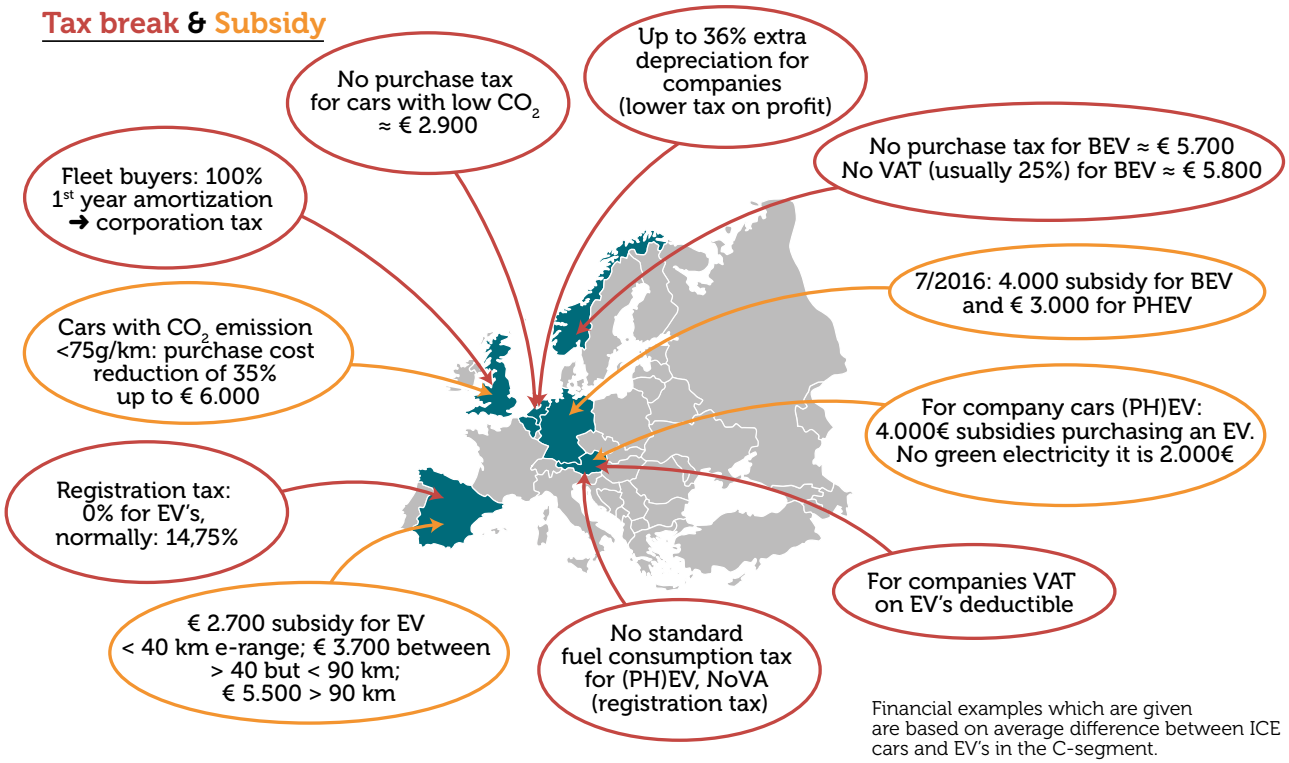
- ´Benefit

Purchase-related subsidies for local level (city / region level)

- Subsidies (-> local air pollution)

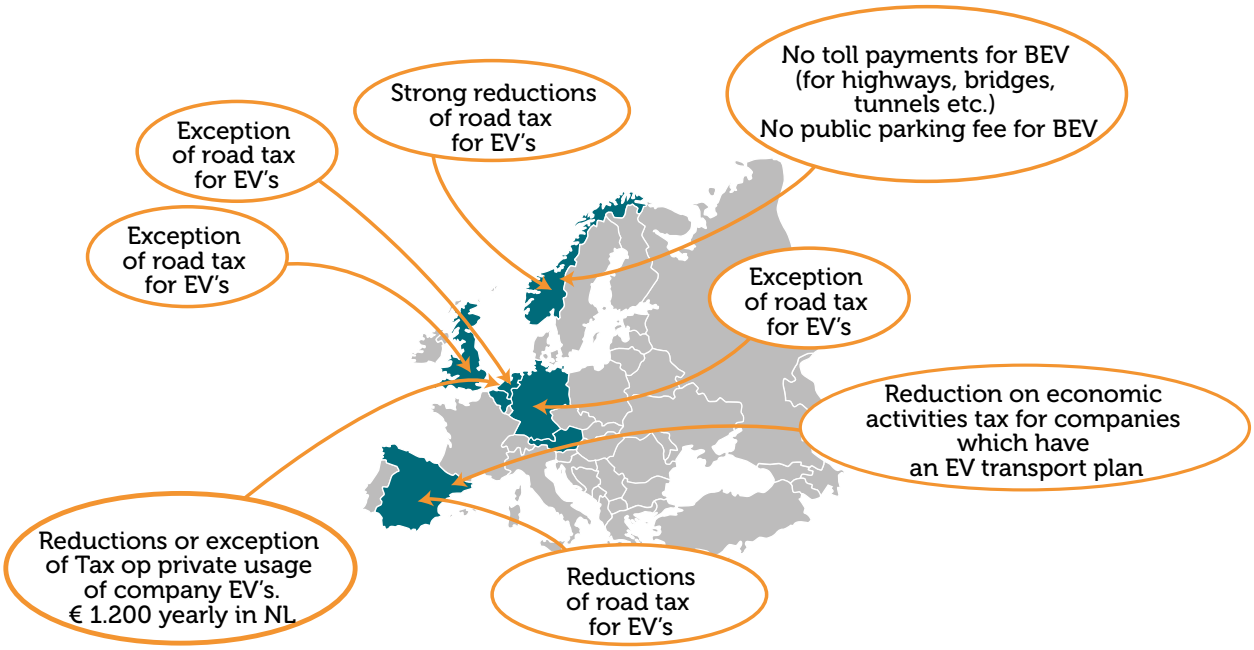
- Countries apply different types of financial incentives for the stimulation of EV uptake
- Countries with high taxation, can have a higher impact on costs differences by tax reduction or exception
- Large differences for the private and company ownership
- Some incentives also applicable for fuel efficient ICE vehicles (low CO_2 emissions) ⇨ less successful for EV's.

Examples of National Purchase incentives



Financial examples which are given are based on average difference between ICE cars and EV's in the C-segment.

Examples of National Operational incentives



Financial examples which are given are based on average difference between ICE cars and EV's in the C-segment

Total cost of ownership

Bosch adds more EVs to the mobility pool for the greater area Stuttgart (6.12.2016)

I-CVUE has provided valuable implementation support to obtain partial funding for investments initiative to purchase electric vehicles and charging infrastructure. This funding was instrumental in tipping the business-case for these vehicles operated in the mobility fleet for the greater area Stuttgart. An initial calculation based on an innovative dispatch-model found that in spite of the current range limitations operational costs were acceptable when using the regenerative power produced on-site at the facility. 10 BMW i3s and 10 VW e-Ups go into full service at the beginning of December 2016. This increases the number of EVs in the mobility fleet up to 55 full electric vehicles.

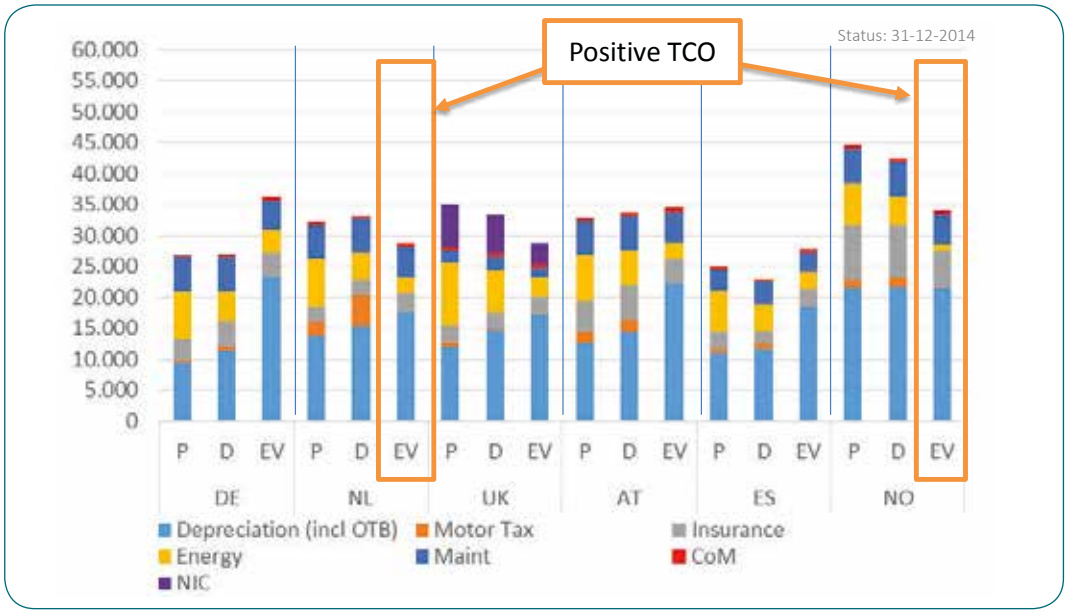
The project is synchronized with mobility concept of the municipality Schwieberdingen and will provide charging spots within the community.

What is new about the infrastructure at Bosch is an innovative access model.

The charging spots are located on the border between the visitor's parking lot and the employee's lot. This means that multiple use of the charging infrastructure is possible. Along with the mobility pool, visitors and employees can use the same infrastructure.

Residents and visitors to the municipality can also use the infrastructure, since the parking lot is open 24/7. Access is free of discrimination since it will be included in the Hubject Pool.

TCO, 4 year company ownership, C segment, 24.000 km/a



TCO costs are cumulative cost of 4 year

P: Petrol

D: Diesel

EV: Electric Vehicle

TCO: Total Cost of Ownership

OTB: One Time Benefits

Energy: petrol/diesel/ electricity costs

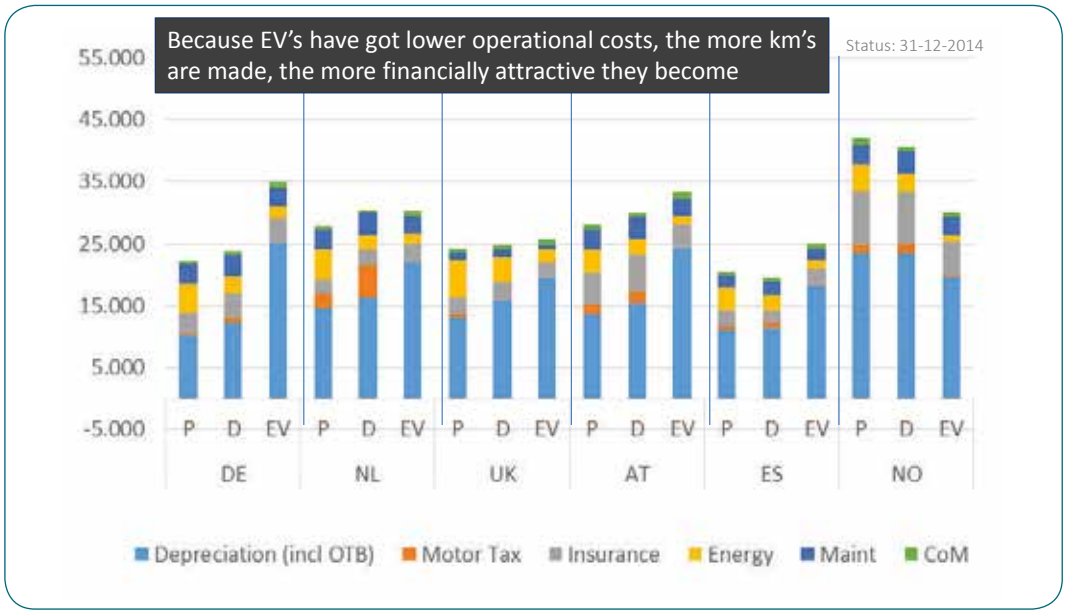
NIC: National Insurance Contribution (social tax)

Maint: Maintenance costs

CoM: Cost of Money

ToPU: Tax on Personal Usage

TCO, 4 year private ownership, C segment, 12.000 km/a



TCO costs are cumulative cost of 4 year

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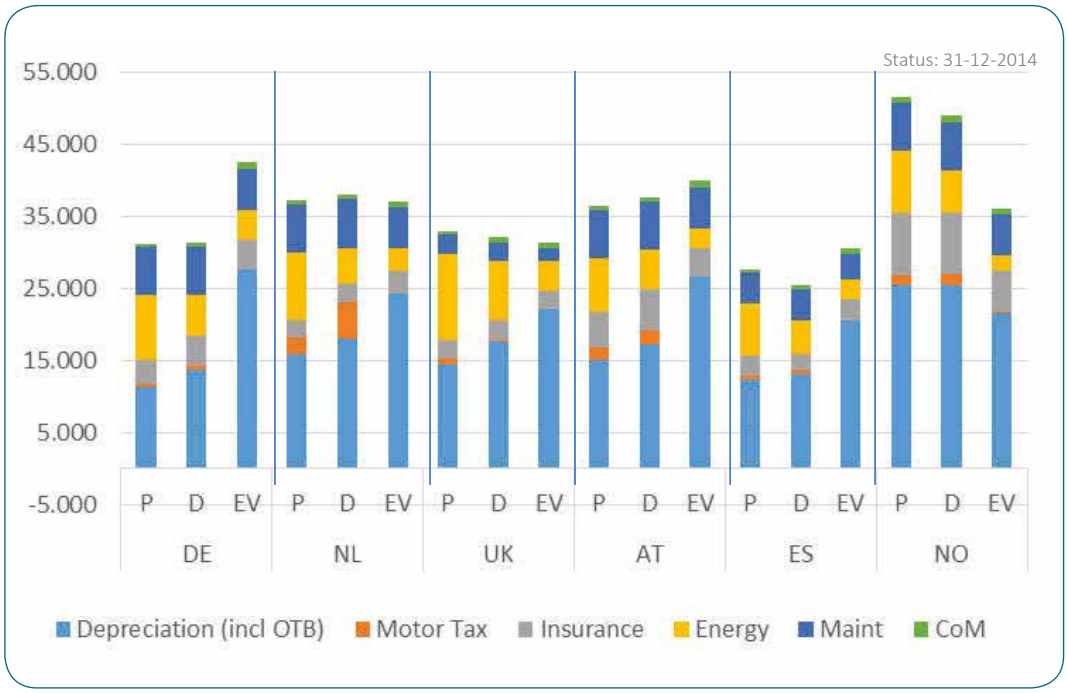
Energy: petrol/diesel/ electricity costs

Maint: Maintenance costs

CoM: Cost of Money

TCO, 4 year private ownership, C segment, 24.000 km/a



TCO costs are cumulative cost of 4 year

P: Petrol

D: Diesel

EV: Electric Vehicle

TCO: Total Cost of Ownership

OTB: One Time Benefits

Energy: petrol/diesel/ electricity costs

Maint: Maintenance costs

CoM: Cost of Money

Boundary conditions

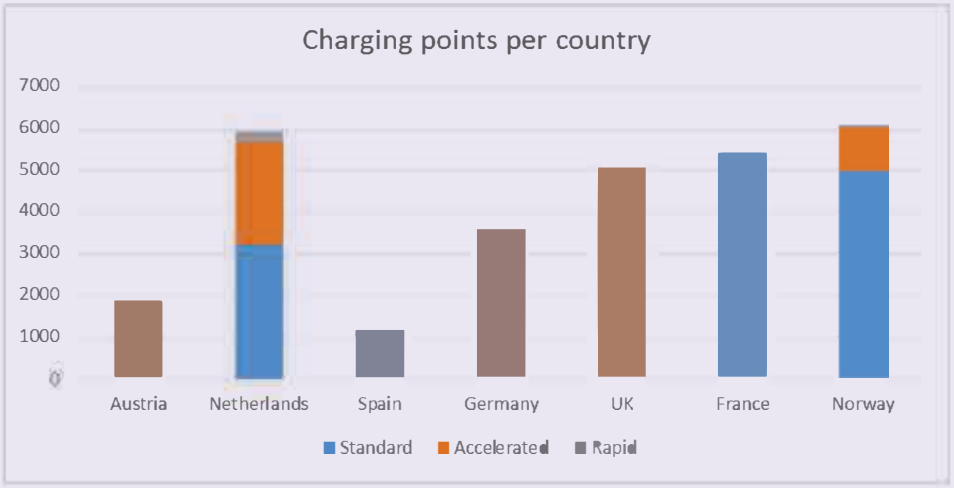
Together with financial incentives are to be taken into accounts as boundary conditions

– public changing infrastructure

– non-financial incentives

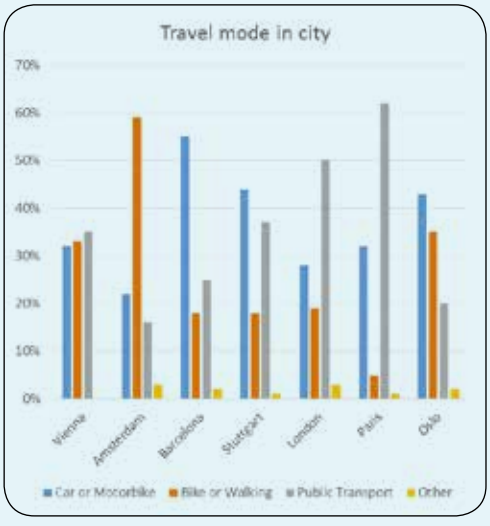
– regional/local conditions

Public Charging Infrastructure

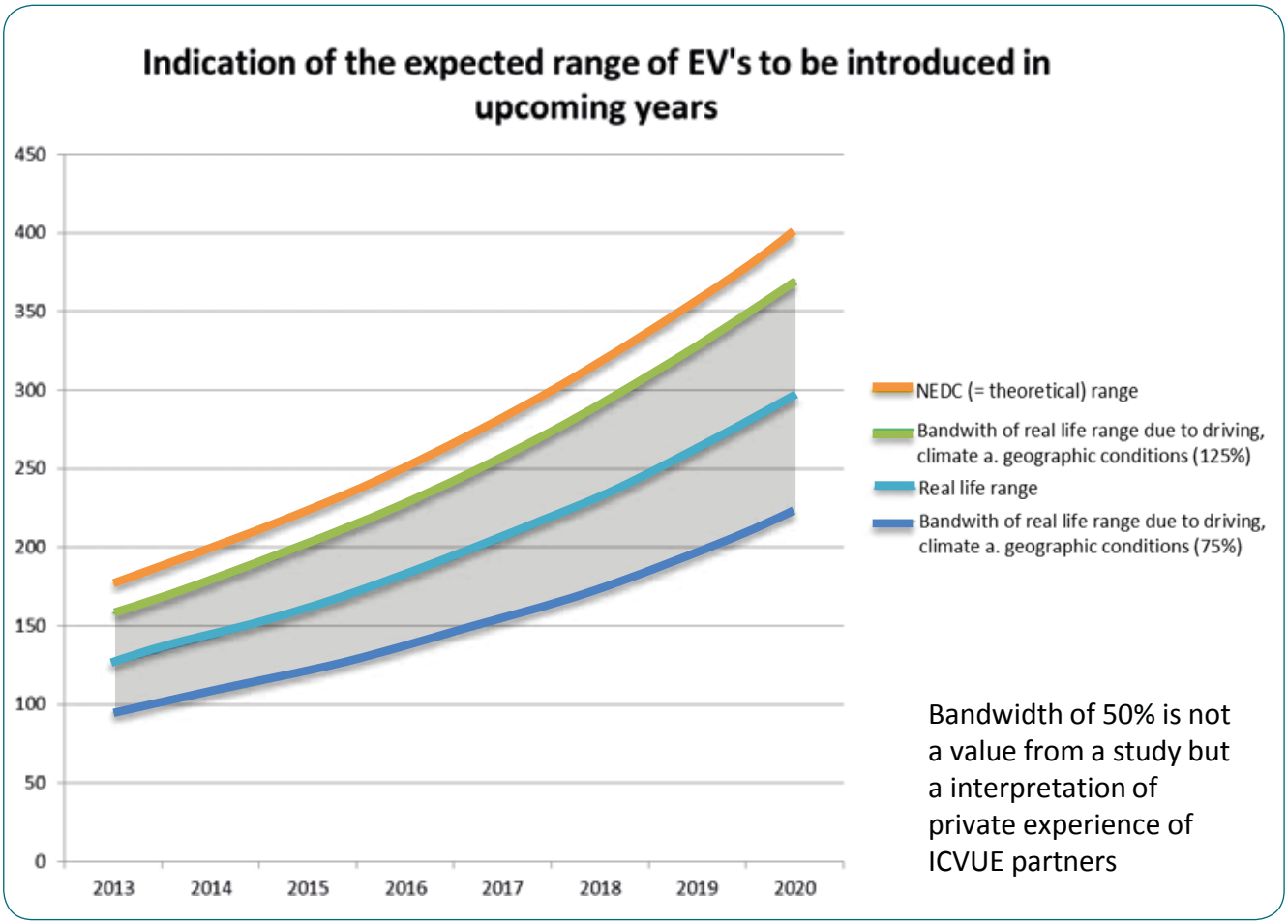


Non-financial incentives

Regional/Local conditions



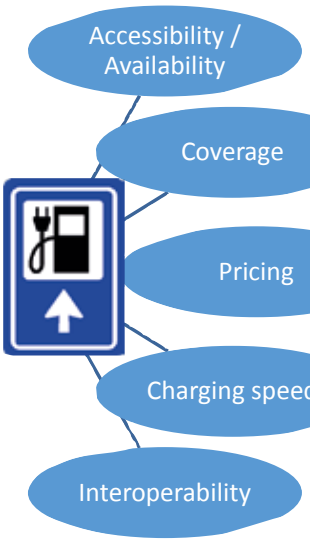
Indication of exptected range of EV's



- Theoretical range is based on information provided by OEM's and/or market experts
- Real life range from current available models is based on information from journalists / vehicles tests
- Real life range for future models is based on the average deviation between theoretical range and real life range of current available models (27%)
- Vehicles which are included in this research have (or will have) a list price in a range of € 20.000 and € 40.000.

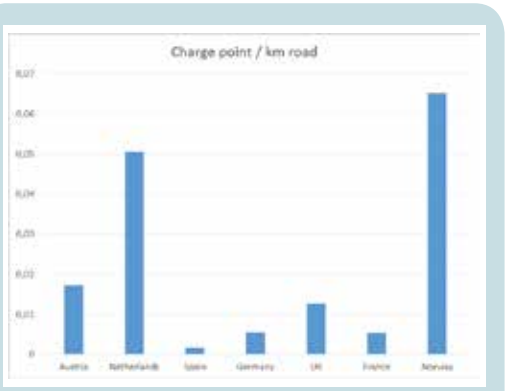
Summary of the most important conclusions

An insufficient charging infrastructure increases the 'hassle' driving an EV, which can be a 'showstopper'. The right boundary conditions for a sufficient charging infrastructure supports the uptake of EVs



COST OF CHARGING

- Chicken-egg situation (EV's – charging infrastructure) needs governmental influence
- Impact of electricity/ fuel costs on TCO are in most cases not significant, but can be substantial depending on where you charge
- Public charging at 35ct/kW or higher make the energy cost for an EV's approach the fuel cost for efficient diesel cars ➜ business case for EV's is destroyed
- Policy aimed at advantages of EV's for accelerated uptake of sales of EV's:
  - Bus lanes access ➜ less travel time
  - Free parking (and charging)
  - Zero-emission zones
  - Exemption of toll on roads (bridges/tunnels)
- The incentives are extremely effective and (depending on the mobility patterns) can be the critical point for the purchase of an EV
- Politically it is a difficult theme but effective and pays back the society (high society cost of emissions)



PRACTICAL EXAMPLES

- In Oslo: a high number of charging points and slow charging is for free
- Electricity in Germany is expensive, fuel is cheap
- In the Netherlands the 'market' is now investing in the charging infrastructure ➜ costs of public charging is higher then before

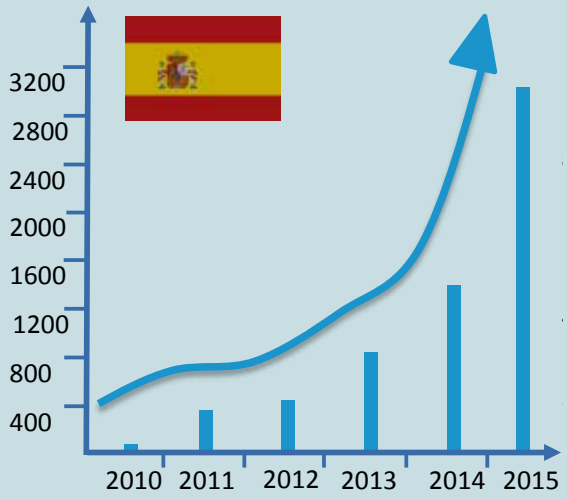
Clear future perspective:

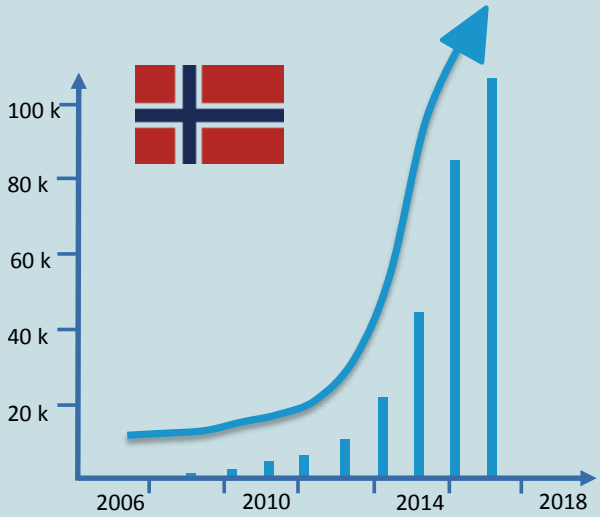
- Incentives need future perspective: consistency and long-term-policy about the advantages is crucialw
- Long-term 'reduction schedule'
- Controllable for the governmental organisations
- Clear strategy for the EV owner
- Do not wait for new, better incentives

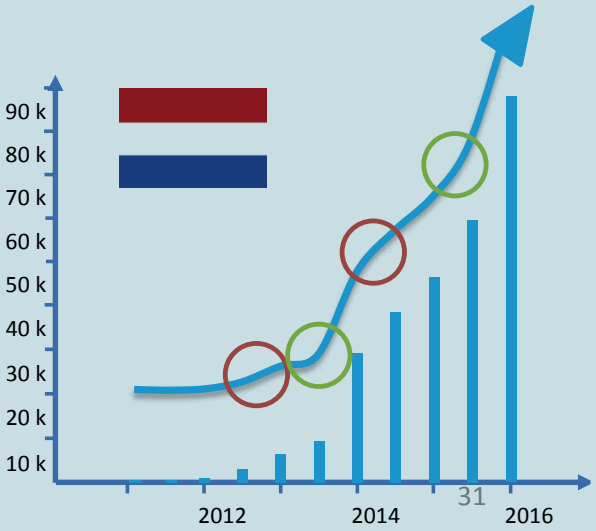
Available EV models are important boundary condition

•The estimation of the effect of governmental incentives is not to be overestimated on short notice

•In 2017 there will be more models available with higher ranges within the B, C & D segment, which makes higher uptake more realistic.







Mentoring

The project has worked with approximately 50 private and public companies (taxi's, delivery, governmental etc.) during the project, providing fleet managers free tailor made support to build a business case for the integration of EV's into their fleets. This has been done through identifying the whole life cost analysis along with emission data and information on the expected commercial benefit of substituting traditionally fuelled vehicles with electric vehicles.

This mentoring has taken place in the UK, Spain, Austria, Germany, The Netherlands, Norway, Luxembourg and Belgium.

Interview Angel Lopez

Director of the Mobility Services of Barcelona City Council

What are the main motivations of the city of Barcelona to develop policies to promote the EV

First of all, there are environmental reasons (air quality and CO_2). Another relevant aspect is the use of energy that can come from renewable energies and, as a consequence, free us from limited resources that decompensate economic balances (Well-to-wheel concept). Last but not least, the reduction of the noise and technological innovation, which despite being secondary inputs provide an additional value.

What types of incentives (focused on the city) have been the most effective in Barcelona?

There are two incentives to be highlighted (a monetary incentive and a non-monetary incentive):

- Free parking in regulated zones (blue and green parking spaces): fee €0 for 2 hours, but there is still the time limit of 2 hours parking in order to favour rotation and to keep an optimal regulation of the public space.
- Circulation on HOV lanes: EV are not allowed to circulate on bus lanes in the city centre, as this implies lane changes made by the vehicles in order to overtake public transport. This zigzagging (taxis do it constantly) implies more congestion in the adjoining lane. The change will be a valid solution for bus lanes with metropolitan connection (less bus density and less stops that would not imply a constant change of lane) and for the planned HOV lanes in the short term.

Last but not least, we should consider that Barcelona installed electric chargers in the loading and unloading zones, but this was not interesting for drivers of commercial fleets as they do give more value to other aspects, such as the access to areas restricted to traffic (city centre).

Are there any other actions that Barcelona city council are developing for the promotion of e-mobility?

Five years ago, Barcelona city council created LIVE, a public-private platform with the shared goal of developing projects, policies, strategies,

new business models and creating a knowledge network. In addition, Barcelona has developed technical instructions for the application of sustainability criteria to vehicles that clarifies the priorities to be taken into account when determining the type of vehicle to acquire. Of course, the first priority are all kind of EVs, and I-CVUE TCO tool could play a role in public administration vehicle purchase.

RWS – Mentoring process

As part of the Dutch I-CVUE mentoring processes, Rijkswaterstaat (also an advisory board member of the I-CVUE project) was a challenging fleet to mentor. Rijkswaterstaat is an organisation which is responsible for management and maintenance of the Dutch National road and water infrastructure. To fulfil this task they have a large fleet of vehicles, of which a significant part are shared vehicles for company use. Rijkswaterstaat has already invested to make their fleet more environmentally friendlier. Currently there are a couple of full electric vehicles (FEV's), plugin hybrid electric vehicles (PHEV's) and even some fuel cell electric vehicles (FCEV's) in their fleet. This makes the fleet of Rijkswaterstaat one of the largest and most interesting fleets mentored in the I-CVUE project.

By analysing a full month of car data -primarily driven distances, it became clear that up to 30% of the shared fossil fuel powered fleet could be replaced by EV's. The mentors indicated exactly which types of cars could be replaced, without any range issues. Not only the fossil fuel vehicles were mentored, also the EV's were analysed. The results showed that there was a higher potential of the usage of the shared EV's in the fleet, with the right support and guidance.

In one year Rijkswaterstaat replaces ca. 400 vehicles. 25% of the replaced vehicle will be EV's in 2017. The conclusions and advice of the I-CVUE mentoring process has played a role in the decision making process of Rijkswaterstaat.

Bosch adds more EVs to the mobility pool for the greater area of Stuttgart

I-CVUE has provided valuable implementation support to obtain partial funding for investments initiative to purchase electric vehicles and charging infrastructure. The funding was just sufficient to tip the business-case for these vehicles operated in the mobility fleet for the greater area Stuttgart. In spite of the current range restrictions, a calculation based on the innovative dispatch model found that operational costs were acceptable when using the regenerative power produced on-site at the facility. 10 BMW i3s and 10 VW e-Ups go into full service at the beginning of Decembber 2016. This increases the number of EVs in the mobility fleet up to 55 full electric vehicles.

The project has to be synchronized with mobility concept of the municipality Schwieberdingen and will provide charging spots are strategic sites within the community.

What is new about the infrastructure at the Bosch is an innovative access model.

The charging spots are located on the border between the visitor's parking lot and the employees lot. This means that multiple use of the charging infrastructure is possible. Along with the mobility pool, visitors and employees can use the same infrastructure.

Residents and visitors to the municipality can also use the infrastructure, since the parking lot is open 24/7. Access is innovative and free of discrimination since it will be in included in the Hubject Pool.

I-CVUE EVENTS

5th EU Electromobility Stakeholder Forum

After the success of the last edition, we are happy to announce that the 5th EU Electromobility Stakeholder Forum will take place at the Thon Hotel City Center in Brussels on **22nd and 23rd March 2017**.

Join us for this free of charge, 2-day event that will bring together high level representatives from industry, research organisations, policy makers and experts to discuss the future of electromobility. The event will also provide an opportunity to hear from a number of projects around electromobility and their achievements, results and lessons learnt."

Please, see the link: http://zeeus.eu/news/5th-eu-electromobility-stakeholder-forum-registration-is-open

EEVC

The EEVC is a annual event, this year taking place for the first time in Geneva, where the exchange of views will take place between R&D, industry, authorities, end-users and NGO's actors. All with the focus on e-mobility, including battery, hybrid and fuel cell electric vehicles. I-CVUE was invited to present the outcomes of the project during a parallel session in the framework of EEVC.

http://www.eevc.eu/page/exhibition/

Social Media

Follow the I-CVUE Project on Twitter (@icvue) has reached 250 followers in 5 months!!
https://twitter.com/icvue

Daily we publish interesting news on our website and social media. We also have more than 120 e-mobility contacts on our LinkedIn group page Incentives for Cleaner Vehicles in Urban Europe.

You can also get our news directly to your mailbox. Just register yourself in icvue.eu/register and state your name, company, and email. And you are all set to receive our news!

To find out more about I-CVUE

➢ ***Website***

www.icvue.eu

➢ ***LinkedIn Group***

I-CVUE: Inventives for Cleaner Vehicles in Urban Europe

➢ ***Twitter***

@icvue

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