



**XXIVth World
Road Congress
Mexico 2011**
Mexico City 2011.

TRIGGERING THE DEVELOPMENT OF ELECTRIC MOBILITY: AN OVERVIEW OF PUBLIC POLICIES

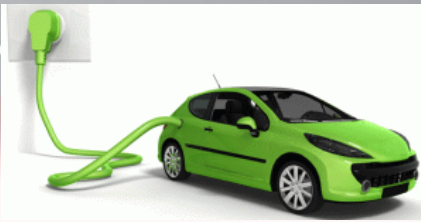
Elisabeth WINDISCH

Laboratoire Ville Mobilité Transport, Ecole des Ponts,
Université Paris-EST

Junior Researcher/PhD Candidate

elisabeth.windisch@enpc.fr





BASICS ABOUT ELECTRIC VEHICLES

This analysis focuses on Battery Electric Vehicles (BEV)

- BEVs run on *electricity only* – stored in the ‘heart’ of the vehicle, the battery (~ 15 - 20 kWh capacity)
- ‘New generation’ BEVs have an (anticipated) range *autonomy of 120 – 200 km*
- For recharging the battery according *recharge infrastructure is needed*
- Recharging can take from 6-8 hours (standard or ‘slow’ charging) to 20-30 min (fast charging)
 - Battery ‘swap’ gives opportunity for rapid charging



ELECTRIC VEHICLES - A UNIVERSAL REMEDY (!?)

Electric vehicles are seen as solution for numerous current public concerns

These refer to

- the *environmental impact* of our mobility habits
- the *energy dependency* of our transport systems
- the *economic/industrial growth* after the years of crisis
- the *resource efficiency* and effectiveness of our transport systems

Supportive public policy measures aim at

- supporting research and development
- developing sufficient offer (vehicles, infrastructure, batteries)
- stimulating demand (private and professional fleets, new service offers)



A TYPOLOGY OF POLICY MEASURES

Supporting the introduction of EVs













- Command and Control Instruments
- Economic Instruments
- Procurement Instruments
- Collaborative Instruments
- Communication and Diffusion Instruments
- Instruments enhancing inter-modality

Possible policy measures are very diverse; priority should be given to network management: The state acts as **facilitator.**



Comparing National Policies I

THE INITIAL INTEREST FOR EVs

Country	Initially Engaged Authority	Authority's missions
EU	<i>DG Enterprise and Industry</i>	
Austria	<i>Ministries of Transport&Technology/Economy</i>	
Denmark	<i>Ministry of Environment</i>	
France	<i>Ministry of Sustainable Development&Transport</i>	
Germany	<i>Ministries of Environment/Economy/Transport</i>	
Italy	<i>Ministries of Economy/Science</i>	
Spain	<i>Ministry of Industry</i>	
UK	<i>Ministries of Transport/Enterprise&Employment</i>	
US	<i>Department of Energy</i>	
Japan	<i>Ministry of Economy&Industry</i>	
China	<i>Ministry of Industry</i>	
India	<i>Ministry of Industry</i>	

Transport	Environment	Economy/Industry	Energy
------------------	--------------------	-------------------------	---------------

Initial interest in EVs stems from economic/industrial concerns.

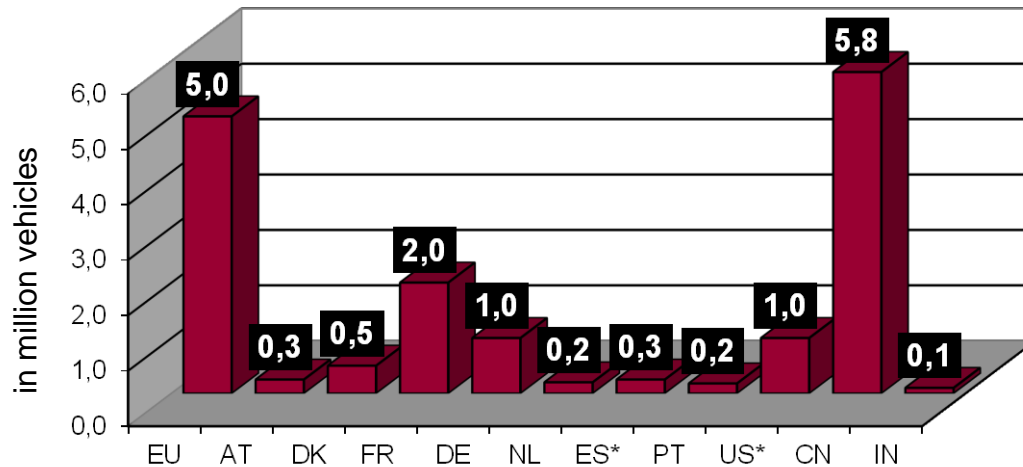


Comparing National Policies II

DEPLOYMENT OBJECTIVES

(PH)EV Deployment goals for 2020

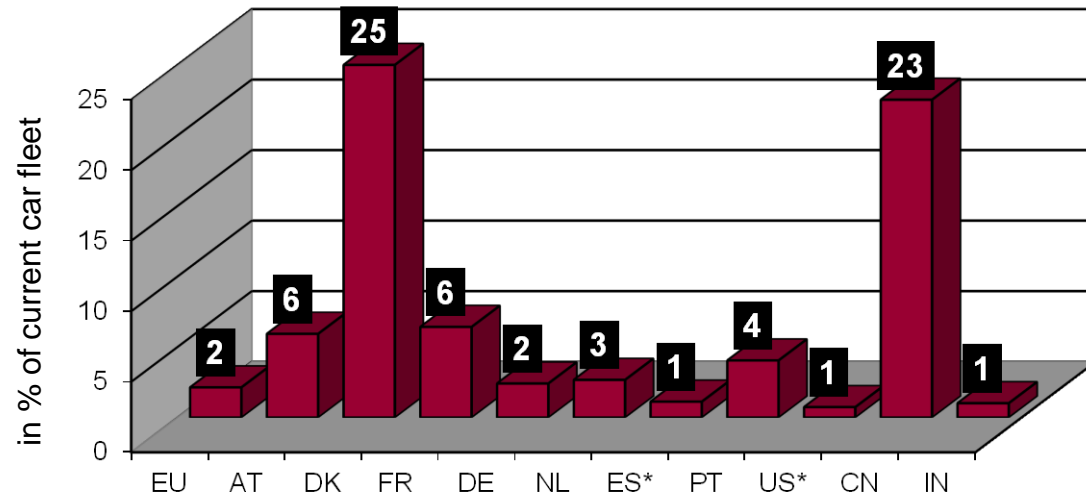
in million vehicles



France shows most ambitious deployment targets within Europe.

Denmark proves to have a far more ambitious goal when considering the anticipated (PH)EV share of the country's vehicle fleet.

in % of current car fleet



The expected rapid growth of **China's** overall vehicle fleet until 2020 impedes valid comparisons with European nations.

Comparing National Policies III

COMMON DEPLOYMENT STRATEGY

Most countries defined a deployment strategy in 3 phases

	Today	Short Term ~ 2012	Mid Term ~ 2015/20	Long Term ~ 2020/30
Research	Pilot projects	█	█	█
	Battery advancement	█	█	█
Infra.	Deployment in metropolitan areas		█	█
	Large scale coverage		█	█
Vehicles	Market launch		█	
	Supply of public/industrial fleets		█	
	Mass market			█
	Decarbonised Transport			█

Supportive measures are categorized in i) support of **research** ii) deployment of **infrastructure** and iii) enhancing **vehicle demand**.

Accompanying development of renewable energy sources is 'only' seen as long term objective.



Comparing National Policies IV

MEASURES PUT IN PLACE

	Enhancing vehicle demand					Infra. Deployment		
	Purchase subsidies	Taxation incentives	Less insurance costs	Reduced/No parking fees	Free PT pass	Subsidies for infra uptake	Public funding for infra development	Tax deductions for infra uptake
AT		++	+		++*			
DK		+++		++				
FR	++			++*			++	++
DE		+						
IT	++	++	+	++*				
NL		++		+++*			+	++
ES	+	+						
UK	++	++		++*		++	++	
PT	+	++					++	
US	++					++		
JP	+	++						
CN	++*	++*					++*	

* on local level

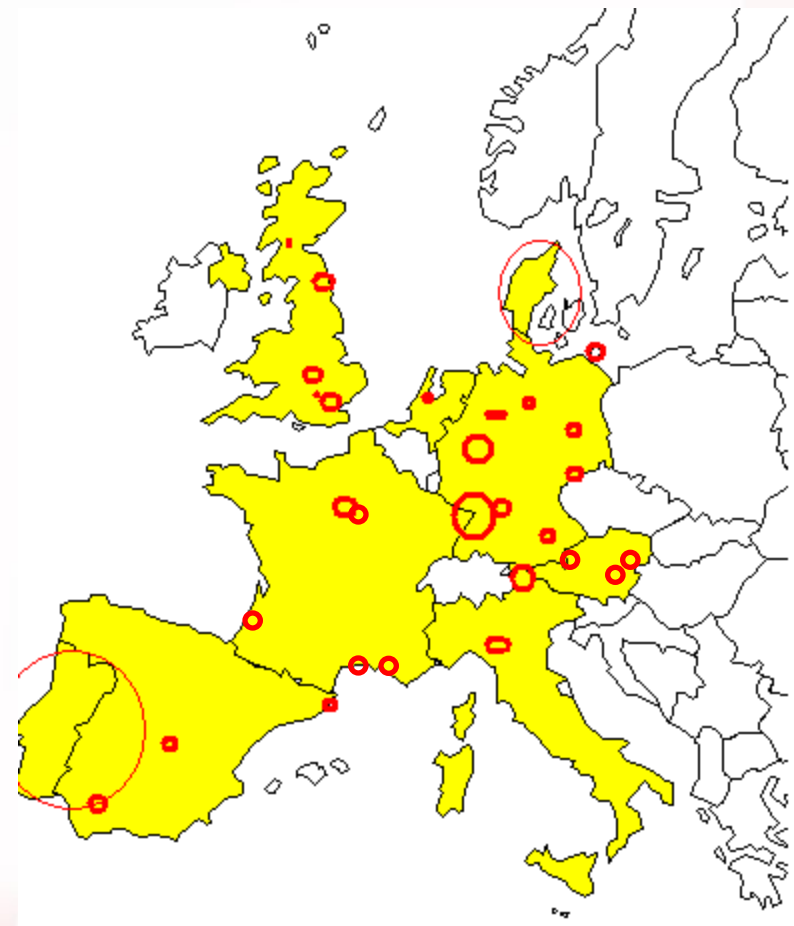
So far focus has primarily been put on measures aiming at enhancing vehicle demand.

The development of according infrastructure measures poses more uncertainties.



REGIONAL TEST AND PILOT PROJECTS

- Geographic scales, approaches and objectives of pilot projects are divers
- Projects operate with different types of vehicle fleets
- Testing infrastructure and exploring usage behavior are the main objectives
- Most projects are heavily supported
-> The financial viability of EVs is not yet tested!



THE PROJECT **VLOTTE** IN AUSTRIA I

VLOTTE - A regional EV test project since August 2009

- **The region Vorarlberg**

- Population: 370.000 – of which 80% in the river “Rhine” valley
- 138 hab./km²
- Large urban extension along the valley



- **Project Partners**

- Local government
- Local electricity provider
- Public transport authority
- Austrian automobile association
- Local insurance partner
- Importer of EVs
- Network of vehicle service providers
- Technical University of Vienna





THE PROJECT **VLOTTE** IN AUSTRIA II

An integrated project organization

- **In 2009: Distribution of 100 EVs among interested parties**
 - 40 for local enterprises
 - 40 for public institutions
 - 20 for private users
- **The user pays EUR 500/month for a mobility card which includes**
 - The usage costs for the vehicle
 - The maintenance of the vehicle
 - A public transport pass
 - Fees for battery recharging (currently 70 stations available)
 - After 4 years the vehicle can be purchased for the residual value





THE PROJECT VLOTTE IN AUSTRIA III

Results

- 1 million EV km have been driven
- Vehicle fleet has been expanded to 250 EVs
- VLOTTE II introduced mobility hubs
- VLOTTE is the biggest European EV deployment project
- Project shows the potential of EVs in remotely dense urban areas



LONDON'S EV DEPLOYMENT PLAN I

Europe's most advance and integrated plan for a metropolitan area

25.000 recharging points + 100.000 EVs till 2015

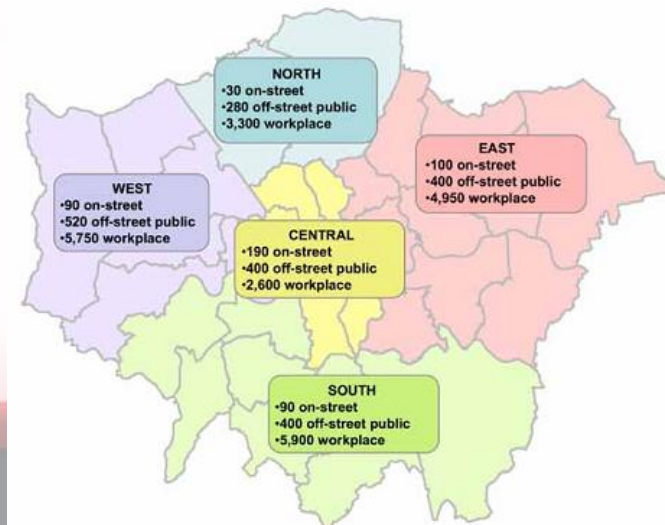
• Infrastructure Provision

- Maximum distance of each Londoner to be beneath 1 km
- Provision of normal, fast and rapid recharging points
- « Hot-Spot » Analyses show where early adapters are located

• Vehicle Deployment

- Introduction of EVs in the city's fleet
- Encouragement of industrial partners to electrify their fleets
- Encouragement of the private sector

...→



LONDON'S EV DEPLOYMENT PLAN II

Europe's most advance and integrated plan for a metropolitan area

25.000 recharging points + 100.000 EVs till 2015

- **Initiation, marketing, communication**
 - Purchase subventions (no taxes, bonus of 5000 pounds)
 - Free parking (value of up to 6000 pounds/year)
 - Exoneration of the 'congestion charging' (value of up to 1700 pounds/year)
- **Functioning of the system**
 - Yearly infrastructure usage fee of 200 pounds
 - Transition to a 'pay-as-you-go' system with increasing usage



CONCLUSIONS

- The development of electric mobility is a mean for facing current economic, environmental and energetic challenges
- Policy measures are often not well equilibrated (offer vs. demand, vehicles vs. infrastructure)
- Most countries defined a deployment strategy of 3 phases
- The accompanying development of renewable energy sources is foreseen for the mid- or long term
- Local deployment projects are an excellent mean for testing the impact, usefulness and possible synergies of diverse policy measures
- Economic impact analysis of policy measures are not yet well established



Thank you for your attention!

Elisabeth Windisch

Laboratoire Ville Mobilité Transport

Ecole des Ponts ParisTech

Elisabeth.windisch@enpc.fr

