5. ELECTROMOBILITY

Policy summary

The promotion of electric vehicles is being considered as a key measure to improve the city air quality and also to reduce CO2 emissions. Furthermore, electric vehicles provide quiet and smooth operation and consequently create less noise and vibration. There are many measures specifically focused in e-mobility, including the provision of a full electric municipal car-sharing service, the development of a public charge points system, mobility advantages for cleaner vehicles, the introduction of electric vehicles in public transport company fleets, the promotion of electric mobility in the freight sector. In particular, an electric car sharing service matches the benefit of electric vehicles with the ones of car sharing, i.e. a service providing members with access to a fleet of vehicles on an hourly basis, which, in turn, reduces vehicle ownership (thus leading to increased parking availability) and vehicle travel, guaranteeing lower emissions (both cutting vehicle travel and through the use of efficient hybrid vehicles) and increased transit ridership.

SWOT Analysis

Strengths	Weaknesses
• Reduction of congestion and related issues • Revenues • Air quality improvement • No significant adverse social impacts	• Efficient public transport required: investment in complementary transport are mandatory • Re-routing of traffic flows on external road network (possible traffic increase outside the charged area, especially at the beginning) • Technological investments and operating costs • Need to define exemptions for some vehicles and citizens categories • Possible negative economic impacts in the short term • Need of maintenance programs and dedicated staffs
Opportunities	**Threats**
• Improvement of public transport efficiency • Targeted investments with the revenues • Possibility to be applied in combination or within a LEZ/LTZ	• Legislative framework, legal controversies • Public acceptance • Social equity: perceived to benefit a 'privileged' client base

Policy topic

- **Air pollution or GH gas**
- Land-use/urban planning/ landscape
- **Traffic noise**
- Congestion
- Traditional fiscal instruments
- Accidents, transport safety
- Public transport subsidies/ support
- Infrastructure investment
- **Users' behaviour**

Level of application

- **National**
- **Regional**
- **Provincial/Metropolitan area**
- **Municipal**

External costs

• Congestion and scarcity	
• Accidents	
• Air pollution (human health, material damages, nature)	++
• Noise	++
• Climate change	++
• Urban space	
• Nature and landscape	

Methodological suggestions

Cost component	External cost	Cost elements	Cost function/ drivers	Suggested estimation techniques	Data needed	Critical valuation issues
Air pollution	'Air pollution costs are caused by the emission of particulate matter (PM), NOx, SO_2 and VOC. Air pollution costs arise also from industry, agriculture and private households.	damages to buildings	traffic level	repair cost	emission data per kind of pollutant	damages quantification
		damages to agriculture	location - exposure		vehicle mix	
		damages to human health	population and settlement density			
		damages to ecosystems	kind of engine - alimentation		network data	
			driver characteristics			
Noise	Noise can be defined as the unwanted sound that causes physiological or psychological harm to humans. It is recommended to take vulnerable groups, likechildren and elderly, into account.	annoyance	the annoyance depends on the traffic level	WTP hedonic price for noise reduction	noise exposure data	noise indicator
		effect on health	resident population and density			
		property value loss	noise indicators			evaluaton of annoyance
			time of exposure			
Climate change	"Climate change is a long term and global risk. A differentiated approach (looking both at the damages and the avoidance strategy) is necessary. In addition long term risks should be included. Impacts of transport are mainly caused by emissions of the greenhouse gases CO_2, N_2O, CH_4."	damages induced by climate change (rise of temperature, rainstorms, tornados…)	emission level dependent on traffic level and kind of propellant	avoidance cost approach or damage cost approach	emission data per kind of pollutant	damages quantification over time
		preventive measures	type of vehicle and equipment in use			
			speed			trend pollution/ altitude
			driving style			

Recommendations / Comments

Technical feasibility	Difficult	Public acceptance	Easy	Equity	Partial

The introduction of electric vehicles can undoubtedly contribute to the overall efficiency of CO2 reduction strategies in the transport sector, but nevertheless the uncertainty related to some technological features, to market success and to consumers' confidence make the outcomes of this technology unpredictable, in particular in the medium period. Another important aspect is the potential impact of electrical vehicles on the electrical grid, and especially on the whole electric consumption: new (and unexpected) developments on electric vehicles technologies, as well as on new technologies, can strongly modify future trends in unexpected ways. At the present time, the main limits that can make it difficult the development of urban electric fleet are: 1) the autonomy and efficiency of batteries and vehicles; 2) the cost – effectiveness of the investment, in particular for public transport fleet and for car pooling services; 3) uncertainty in market penetration of this kind of vehicles, that may threaten the financial sustainability of long-term investment programs; 4) consumer's confidence, in particular for freight distribution vehicles that require a drastic change in the urban logistical perspective.

Related Good Practices

- **Autolib' Paris**
- **Network of electric charge points for e-cars**