



# E-Mobility Solutions

Promoting Electric Vehicles



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**Urban Electric Mobility Initiative (UEMI)** was initiated by UN-Habitat and the SOLUTIONS project and launched at the UN Climate Summit in September 2014 in New York.

UEMI aims to help phasing out conventionally fueled vehicles and increase the share of electric vehicles (2-,3- and 4-wheelers) in the total volume of individual motorized transport in cities to at least 30% by 2030. The UEMI is an active partnership that aims to track international action in the area of electric mobility and initiates local actions. The UEMI delivers tools and guidelines, generates synergies between e-mobility programmes and supports local implementation actions in Africa, Asia, Europe and Latin America.

**SOLUTIONS aims to support the exchange** on innovative and green urban mobility solutions between cities from Europe, Africa, Asia and Latin America. The network builds on the SOLUTIONS project and brings together a wealth of experience and technical knowledge from international organisations, consultants, cities, and experts involved in transport issues and solutions.

**The overall objective** is to make a substantial contribution to the uptake of innovative and green urban mobility solutions across the world by facilitating dialogue and exchange, promoting successful policy, providing guidance and tailored advice to city officials, fostering future cooperation on research, development and innovation.

**SOLUTIONS\_UEMI supports urban mobility** implementation actions that contribute to the Paris Agreement and the New Urban Agenda.

**Sustainable energy and mobility** can make positive contributions to a number of policy objectives, nationally and locally. In particular in cities there is a great potential to create synergies between for example safety, air quality, productivity, access and climate change mitigation. A UEMI resource centre will provide opportunities for direct collaboration on projects focusing on sustainable urban mobility and the role e-mobility can play in it. The UEMI will pool expertise, facilitate exchange and initiate implementation oriented actions.

**UN-Habitat, the Wuppertal Institute & Climate Action Implementation Facility** jointly host the resource centre for the Urban Electric Mobility Initiative, aiming to bridge the gap between urban energy and transport and boosting sustainable transport and urban e-mobility.

UEMI

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Aims

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## In brief

**Gasoline- or diesel-powered vehicles** cause severe problems. They pollute the air, emit greenhouse gases, produce noise and consume increasingly expensive fossil fuels. Electric vehicles (EVs) are a promising alternative that can address these problems and contribute to a sustainable transport system.

Cities can actively promote EVs among private companies and individual vehicle owners and encourage them to replace their diesel or gasoline vehicles with electric ones. A holistic strategy that informs and promotes EVs, rather than less successful stand-alone activities, is key to driving this change.

## Examples

**The solution consists of two main elements.** First is creating an organisational and administrative framework for developing and implementing an e-mobility strategy. Dedicated working groups and roundtables can help municipal departments work together and coordinate with e-mobility stakeholders (such as electricity suppliers, car-park operators and car manufacturers). A local e-mobility strategy and related action plans are important to conduct coherent promotional activities. Second, cities should implement specific measures.

Cities around the world have tested different policies and measures to entice the public and companies into embracing EVs. These include:

- introducing reduced or free parking for EVs, as in Oslo (Norway);
- exempting EVs from congestion charges or city tolls, as in London (UK);
- giving EVs access to lanes reserved for cars with a driver and one or more passengers, as in California (US);
- providing subsidies or low-cost loans for EVs, as in Hangzhou (China)
- organising test rides and promotional events, as in Hannover (Germany)
- offering electric vehicles in carsharing schemes, as in Barcelona (Spain)

In addition, cities must address the need for charging infrastructure. Even though private stakeholders usually install and operate charging infrastructure, municipalities can accelerate the process by organising working groups that bring together relevant stakeholders. The city can provide parking lots for public charging facilities and recommend that developers consider charging infrastructure for new buildings.

## In brief

## Examples

## Results

### **EVs offer several advantages compared to gasoline or diesel vehicles:**

- Zero exhaust emissions – EVs do not produce any exhaust emissions during operation
- Reduced noise pollution – As EVs generate no propulsion noise, these vehicles are very silent at low speeds (usually below 30 km/h).
- Increased independence from fossil fuels – A variety of resources can produce electricity, including renewable sources (solar, wind, geothermal heat, water).
- Reduced greenhouse gas emissions – EVs can help mitigate the effects of climate change. This potential is highest if the electricity comes from renewable sources.

However, simply replacing a conventional vehicle with an electric one does not address wider transport problems such as congestion, traffic safety and the extensive use of land for parking and roads. Therefore, cities should integrate an e-mobility strategy into a wider system of sustainable mobility.

### **Technical & financial considerations**

**Advanced battery EVs** are relatively new and the technology is still developing. Due to the limited distances EVs can travel, charging requirements and the limited number of available models, EVs might not fulfil the needs of all vehicle owners. However, EVs are suitable, for instance, as delivery vehicles or service vehicles especially in urban areas.

Today, an EV usually costs more than a conventional vehicle. However, EVs cost less to operate and to maintain. The cost-efficiency of an EV also depends on the local framework conditions – such as fuel/energy prices, taxes, subsidies - and how much the vehicle travels a year. Company cars usually travel a lot, so EVs offer organisations lower total costs of ownership than conventional vehicles.

A city should carefully assess the potential negative side effects of promoting EVs. For instance, opening bus lanes to EVs can affect bus services, and free parking for EVs can encourage people to stop using public transport (and from walking and cycling) to drive personal cars. Therefore, cities should align promoting EVs with wider urban mobility objectives. For example, replacing gasoline-powered cars with electric two-wheelers provides even stronger benefits than a one-to-one substitution.

## Results

## Technical & financial considerations

## Policy/legislation

**The best local activities link** to national or regional schemes for promoting EVs. In some cases, a respective national legislative framework is required to implement policies for promoting EVs locally. To grant privileges to EVs they also have to be easily recognised; in Germany, the 2015 Electromobility Act introduced a registration sticker for EVs. The Act also sets the legislative framework for cities to offer privileges such as lower parking fees, the use of bus lanes or allowing them into areas where regular traffic is restricted. However, cities are responsible for implementing the privileges.

Tax incentives (such as annual vehicle and fuel taxes) or subsidies for clean vehicles provided by the national government also influence the success of local EV promotional measures. In addition, a strong national framework on norms and standards for EVs and related technologies is required for large-scale roll out. This links to vehicle and charging technology, and to the data and accounting interoperability of charging providers.

## Transferability

**This solution is replicable in other cities.** Cities should carefully select individual measures for promoting EVs based on their local circumstances and national framework conditions. The amount of greenhouse gases that cities can cut also depends on how much carbon local electricity providers emit.

The benefits of reducing local air pollutants from vehicle tail-pipe emissions are transferable across cities and countries. Replicating specific measures to provide privileges for EVs might not be possible in some cities due to the lack of a national legislative framework. Socio-economic and cultural factors such as people's purchasing power and their environmental awareness can also influence the success of the measure.

# Policy/legislation

# Transferability

## Context

**Barcelona is the second largest city in Spain** with about 1.6 million inhabitants. In Barcelona, public transport has a modal share of 40%, private transport accounts for 27% and non-motorised modes for 33%. Barcelona decided to promote EVs to reduce emissions and noise, to lower the dependency on oil and to improve living conditions and public health.

About 30% of the Spanish automotive industry is located in the metropolitan area of Barcelona. The city sees e-mobility as an option to provide opportunities for technical and economic development and to ensure the global competitiveness of the car industry. The new Sustainable Urban Mobility Plan of Barcelona includes, as one of the main strategies, the promotion of e-mobility. Spain's national government supports EVs with direct purchase subsidies and tax deductions.

## In action

**Barcelona implemented several measures** to promote EVs in the private sector. In 2009, it created the LIVE platform - a public- private partnership to coordinate, monitor and communicate e-mobility activities in Barcelona and the surrounding area. The platform is led by Barcelona City Council, the AMB (the public administration of the metropolitan area of Barcelona), and the Government of Catalonia and is open to all private entities with an interest in e-mobility.

The LIVE platform coordinates the e-mobility plans of various levels of government, spreads information and raises awareness among companies. In 2014, it had a budget of €164,000 to carry out its activities. Five working groups within LIVE holistically address e-mobility:

1. Knowledge and Communication
2. Legal Framework
3. Fleets and Test Beds
4. Infrastructure and Energy
5. Industrial Transformation and Innovation

LIVE actively supports policies and projects to promote e-mobility and supports new start-ups offering EV products and services. It also provides subsidies for charging infrastructure (€2,000 per plug for on-street stations and €1,000 for off-street stations) and works with private stakeholders to install infrastructure

# Case Study: Promoting EV's in Barcelona

## In action



in hotels or shopping centres. Furthermore, the city provides tax deductions and free parking for all-electric vehicles. In new public car parks, 2% of the spaces are reserved for EVs.

The platform also developed a guide for current and potential EV users, and it operates an EV helpdesk. With LIVE's support, Barcelona introduced a flexible electric motorbike sharing system, which residents and visitors can use. An additional scheme allows visitors to rent electric motorbikes at their hotels. It also developed specific charging stations for electric two-wheelers.

## Results

**Due to its e-mobility activities,** many around the world recognise Barcelona as a city that has embraced EVs. The city has about 250 charging points, of which about 130 are for electric motorbikes. Catalonia has about 1,000 charging stations and the region is seeing increasing registrations of EVs; in 2015 it registered 663. About 15 start-ups formed, offering e-mobility products and services. The LIVE platform is an effective system of governance that promotes e-mobility in the city.



## Results



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