EVUE Expert Seminar

London

24 – 25 November, 2011

1 Introduction

In November 2011 London hosted an Expert Seminar for EVUE partners and stakeholders to explore together, in a workshop format, the four main themes of the project: Business Models, Infrastructure, Procurement and Awareness Raising.

Each workshop started with presentations from experts. These were followed by small group discussions of key questions that had been formulated in advance drawn from the EVUE Baseline Report. This meeting report aims to document the main inputs from experts and the learning outcomes arising from the interactive workshops and subsequent reflections.

The meeting started with fresh news from partner cities about their e-mobility actions.

2. Partner Updates

Lisbon currently has a network of 480 charging points (CPs) already installed and ready to use on-street and in public car parks. Work continues with partners to deliver comprehensive coverage of charging points across Lisbon of 687 CPs by the end of 2011.

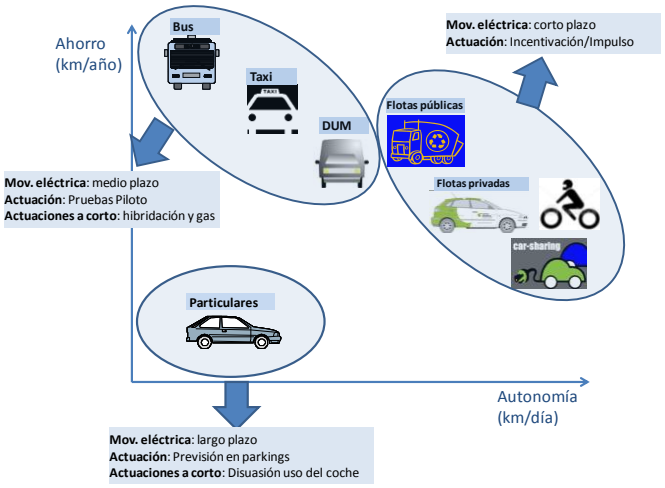
EMEL Executive Board members are using a Nissan Leaf for official short journeys and parking enforcement officers are using electric scooters.

At a recent meeting of the URBACT Local Support Group a problem tree analysis was undertaken to focus on how to increase the share of EVs in the city.

EMEL has launched a new survey to evaluate EV operation and consumer satisfaction and to assess the potential environmental impact. Vehicles will be monitored and drivers will be asked to complete a logbook and survey. The findings will be presented during European Mobility Week in September 2012. As an incentive to participate EV owners are offered free parking during the nine-month survey period.

Municipal maintenance EVs in Lisbon

Madrid has completed the first draft of its Local Action Plan. It includes an analysis of support measures for electric vehicles in the city, and the economic, technical and regulatory barriers. It goes on to describe the targets for EVs in Madrid and the actions being developed to achieve them.



Madrid's approach to EV market segmentation

In terms of infrastructure there are now 22 on-street and 248 off-street CPs. 137 Movele cards (charging cards) have been issued and 65 "Zero Emissions" labels. Local tax law has been changed in order to give equal benefits to PHEV and EV.

Madrid is working with a Chinese company to supply big electric buses to complement their smaller capacity vehicles. Utility organisations are developing the fast charging infrastructure necessary for taxis to become EVs given that they drive around 280 km per day.

An EV information portal has been developed, new low emission zones are being introduced and the next steps for Madrid include bilateral, voluntary agreements for fleet renewals and a European funded urban freight project.

Sally Kneeshaw reported how a start up social enterprise in **London 'Local Greens'** is using an electric van to deliver vegetables. The small Megavan is used for both storage and delivery of the food, and is charged overnight on street.

This is a good example of a very practical application of an EV that helps to promote a green brand.

As part of the Local Action Planning process in **Katowice,** a stakeholder analysis took place to identify challenges and solutions associated with the roll out of EVs in the city. Subsequent planned actions include introducing an effective system of incentives for EV users, such as free parking and the installation of charging infrastructure. The city is also introducing a hybrid bus, a Solaris Urbino12 Hybrid, and planning to purchase an electric car.

Katowice has been chosen by IBM to be a participating city in a developing market for intelligent transport systems.

Beja has developed an e-mobility website integrated into the city website. The Local Action Plan is available in English and the Sustainable Energy Action Plan has been approved by the city council. They have applied for a grant from European Investment Bank.

There has been some progress in the air quality monitoring system and this is transferable to other cities as a way to justify the change to electric vehicles.

Stockholm has produced a report on risk analysis for the procurement of electric vehicles.

3 Workshop on Business Models

The first workshop focused on business models aimed to tackle the following key questions**:**

- How do we incentivize and make a business case for e-mobility in our cities?
- What are the business models? Where does the investment come from? What is the return on investment? For cities, businesses, citizens? Eg business opportunities, improving air quality, reducing public health issues associated with traffic pollution etc
- What are the economic, political, technical and regulatory constraints/opportunities for cities? How can the issues be resolved and the outcomes maximised?
- How can/are the benefits of E-mobility be measured and communicated?
- How can the EV customer experience be improved and made more attractive to new customers?

The Expert Speakers were:

Susan Claris, Office for Low Emission Vehicles, UK
Neil Sharpe, Chargemaster, UK
Daniel Vega, ECOMOVE, Denmark

Susan Claris, presented UK government policy and investment in EVs. She explained how the UK Office for Low Emission Vehicles (OLEV) [1]works across three government departments: Department for Transport, Department for Business and Department for Energy and Climate Change.

The strategy for low emission vehicles encompasses work on standards, incentives, infrastructure and industry. From a government policy perspective plugged in vehicles can contribute solutions to the following issues:

- Climate change
- Increasing urban population
- Energy security
- Green growth
- Decarbonising the electricity system
- Air quality and noise
- Resilience
- Governance opportunities

The UK government has confirmed £400 million investment to be spent on consumer incentives for EVs, funding for research and development activities, and for continued investment in Infrastructure – the Plugged-In Places Programme. The plug in car grant of £5000 on designated cars (excluding vans) has been in place since January 2011 and so far the take up is split between business / private ownership at a rate of about 75% / 25%

In June 2011 OLEV produced a strategy on infrastructure for plug-in vehicles with three target locations.

1. At home, overnight
2. Workplace: fleets and commuters
3. Public places: car parks, on-street etc

OLEV is working with vehicle manufacturers, energy retailers and energy network companies to specify how the back-office functions for recharging infrastructure will operate and develop recommendations on the most cost-effective way to ensure that recharging occurs off-peak.

Susan concluded that public interest is increasing and that that the key challenges for OLEV remain:

[1] http://www.dft.gov.uk/topics/sustainable/olev/

- Supply of vehicles
- Demand
- Infrastructure
- Perceptions
- Interoperability / roaming (commercial challenges)
- Off-peak recharging
- Business models

Neil Sharpe then introduced **Chargemaster**[2]**,** a pan-European provider of charging technology and European e-mobility partner of Nissan and Renault. Chargemaster produces a whole range of technical solutions for charging with varying degrees of intelligence in the posts.

For the city of Amsterdam Chargemaster has installed 1250 streetside charging points and a back-end system with live mapping.

In London, Chargemaster supplies CPs for the Source London network, including a significant roll-out of wall mounted dual charging units in car parks, combined with back end connectivity with Siemens.

Neil summarised the market challenges as:

- Technical standards, domestic, public and pan European (Socket, Connector, ZE Ready)
- AC vs DC and the EV users perspective
- Low EV Sales due to problems of cost availability, viability, and choice
- Public scheme collaboration

Chargemaster has launched a new infrastructure initiative called POLAR, investing £10m of its own funds to create a unified ecosystem for EV users. Sold in the vehicle showroom in partnership with OEMs there is a target of 4,000 bays by December 2012, expanding to 20,000 bays by 2015. The service is paid for by a simple-to-understand monthly subscription with a minimum 2 year term.

[2] http://chargemasterplc.com/

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Polar wall mounted dual socket CP

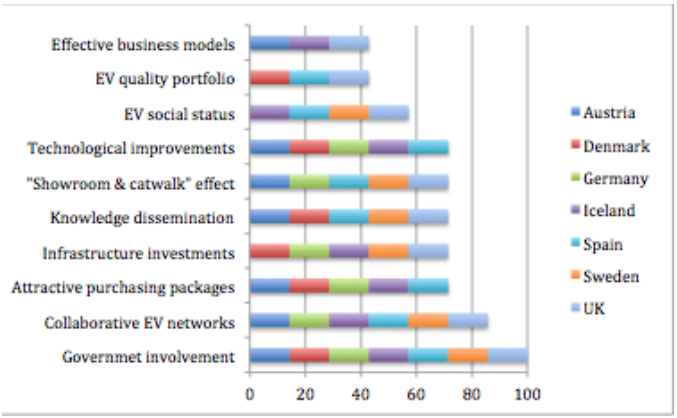
Chargemaster's investment in POLAR is justified by the fact that the UK will be the most dense area for EV charging. Chargemaster believes that POLAR encourages inward investment by OEMs, creating employment opportunities and specialism within the UK.

POLAR is in line with the UK government vision to see private sector business models succeed and to help to make the EV users life less complicated.

Daniel Vega, a recent International Business MSc graduate, presented his master's thesis on market development approaches based on ECOMOVE[3], a Danish OEM.

EV markets are still immature and despite a significant number of SMEs, like ECOMOVE, working on e-mobility products, they face serious financial barriers. Daniel suggested a two-step methodology for EV market development for SME EV producers.

The first step is analysis of market drivers in different EU member states, and catalytic factors such as government involvement, 'showroom and catwalk effects'. *(see chart below)*



The second step is to harness collaborative networks as a good way to support SME market

[3] http://en.ecomove.dk/

penetration. They have an increasing presence at a European level**,** and **c**ities can help SMEs to link into these networks to extend their markets and better understand the key market drivers in this segment. SMEs in green technologies, such as e-mobility, can help local and regional economies to grow.

Findings from the workshops

Small group discussions on the key questions resulted in the following feedback.

Developing sound business models is the hardest part of EV strategies, and the participants' opinions and proposals vary considerably in this topic. There are many unknowns, such as the residual value of EVs, and the rate of EV take up. Cities need to listen also to economists and marketing professionals, as well as technical professionals and OEMs.

Public policy can and does support the development of EV markets and business models, with incentive packages such as:

- installation of charging infrastructure
- free parking,
- vehicle subsidies
- planning regulations for new and existing developments

There needs to be clearly communicated timetables for the reduction or removal of incentives built into the business models. The purpose is to kick start the market and they are not sustainable in the longer term.

Private public partnerships are a vital component of EV business models. Cities need to develop new collaborations with commercial companies. However, as local authorities are often risk averse and lack the experience or skills to do this, there needs to be a culture change with appropriate training.

Economic development teams need to understand the possibilities that EVs bring, to be informed about EV strategies and synergies and to support SMEs to enter and succeed in this emerging market. Local authorities can act as a facilitator, bringing stakeholders and supply chains together, to boost business growth.

City or delivery companies could be allowed to sell licenses to allow green logistic activity within small areas, eg pedestrian zones or low emission zones.

Cities could explore car sharing models that incorporate both public and private use of EVs.

There is still significant difficulty with the identification of a stand alone, independent business model for EVs. Chargemaster is trialling a business model, but it is still speculative.

4 Workshop on Procurement

Key questions for the workshop on procurement were:

- How can procurement be used as a tool for increasing uptake of EVs- in public and private fleets?
- What are the major barriers for fleet managers/cities? How can they be overcome?
- Are EV fleets economically and technically feasible? Is communicating Total Cost of Ownership the solution?

The expert speaker line up was:

Robin Haycock, The Climate Group
Eva Sunnerstedt, City of Stockholm
Philippa Gibbons, Transport for London

Robin Haycock, of The Climate Group (TCG), started with the proposition that fleets can accelerate the electrification of transport and fill the gap between early adopters and a mass market. Typically 50% of all new vehicle sales are through fleets. All the trials and evidence to date shows that people like EVs, and do not want to return them, once they have tried them. EVs in fleets provide a way for new consumers to touch and feel the new products without risk.

Fleet managers and companies are generally less risk averse than individuals. As long as the Total Cost of Ownership (TCO) works it is an easy market to target. It can generate more volume with less effort.

Fuel is the biggest operating cost for fleets and EVs represent an alternative. While the initial cost may be higher, they are cheaper to operate as opposed to a lower purchase price and higher running costs. The Climate Group analysis to date suggests that we are at the start of TCO for EVs in fleets making sense.

The Climate Group is working with fleet owners and OEMs to identify the 'sweet spots' – where the vehicles fit perfectly for this emerging technology. It fits into a defined range of distance travelled per day, a specific vehicle size and shape, a specific duty cycle, and a life of the vehicle. Vehicle ownership length needs to be factored in, (a 3 or 4 year period compared with 8 in the US, for example) and the emerging questions around twice leasing vehicles.

So the 'sweet spots' of EV deployment are

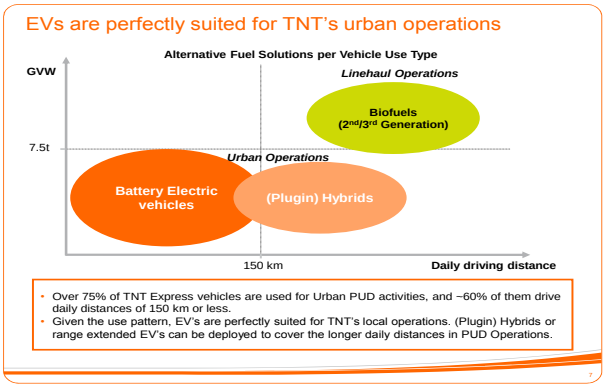
- where the EVs benefits are maximised
- where the downsides are minimised!
- when the vehicles are not 'general usage'
- when the end user is delighted with the vehicle!

Robin stressed that it is 'no good just hoping for the best!' Robust analysis, change of practice, and focused attention on getting it right will lead to positive change.

Robin gave the example of TNT (a logistics operator), which is attempting to improve its carbon efficiency by 40% from 2007 to 2020. Vehicles are currently one of the main areas of attention, with EV's considered a good solution for their fleet, give the usage patterns of:

- Relatively short and highly predictable range
- Relatively small vehicles
- Plenty time available for overnight charging at own locations (no public charging infrastructure required)

From TNT's perspective zero emission zones in cities would be an enabler for EVs to be deployed into a city centre. The cost element goes away and this is then further optimised due to energy efficiency.



EVs for logistic deployment, the 'sweet spot'

In terms of fleet buying consortiums TCG's findings are that:

- They bring people together to share experience
- They develop tools to help people make decisions
- They **don't** bring cost savings from bulk buying
- They can be very complicated to manage – legal, contracts, specifications.
- Mixing public and private fleets is challenging.
- They are limited by duty cycle and technical specifications

In February 21012 TCG will launch a report 'Plugged in Fleets' emphasizing the need to look for solutions now and not in five years.

Robin concluded that fleet managers should only deploy vehicles where they make sense. It takes a lot of work to develop a plan, convince managers of the benefits, educate all parties involved, deploy vehicles and then build understanding on a continuous basis, "It is not just about buying a few and bunging them at the fleet manager."

There is a real need to develop tools and processes to sort out cost-effectiveness analyses. Managers and drivers need to be helped to go from starting point to the point of purchase and deployment.

Eva Sunnerstedt of City of Stockholm explained the process and results so far of the Swedish EV bulk procurement exercise[4]. Undertaken by a partnership including Stockholm and Vattenfall the aim was to make sure that, in this early stage, Sweden is an attractive enough market with sufficient demand for EVs to attract OEMs.

Funding was provided for the extra cost of the EV/PHEV by a maximum 50 000 SEK (€5,000). The original goals were to involve 150 organisations, 6000 vehicles and at least eight offers from the car industry.

Other benefits include contributing towards a cleaner and quieter vehicle fleet, and make it possible to buy/lease EVs and PHEVs under the best conditions. For public organisations the bulk procurement saves time and money since the process in done in partnership rather than individually.

The procurement itself was a lengthy two phase procedure in line with EU and national procurement laws. The results are that 296 organizations are involved as partners/buyers: 260 public and 36 private. Approximately 1250 vehicles will be supplied each year split as follows:

850 to public sector
- 550 cars
- 300 vans

400 to private sector
- 250 cars
- 150 vans

14 manufacturers initially expressed interest. A detailed specification was created for passenger and delivery vehicles[5]. Six companies were successful in fulfilling all the tender requirements. Some major OEMs did not submit a tender and some were excluded as they failed to include all of the required information. Finally, these vehicle suppliers were selected to provide six types of passenger car and three transport vehicles. The suppliers may include new models later on.

National funding is available for the first 1,000 EVs/PHEVs that are bought under the frame work agreements signed, under the following conditions:

[4] www.elbilsupphandling.se
[5] Please contact the City of Stockholm for more details

- 25 % of the additional cost, maximum 50 000 SEK (€ 5 000) is available
- 2/3 is to be given at once, 1/3 in the year 2014
- The vehicle must be owned or leased for 36 months

In return for the subsidy the owner has to:

- give information on the vehicle
- report data and answer questionnaires

Philippa Gibbons, of Transport for London (TFL), reported on the London experience of a framework procurement of EVs and CPs. The activity was undertaken in response to the Mayor's EV Delivery Plan, which addresses a number of important policy challenges for London:

- Climate Change

Road transport is responsible for 16% of London's CO2 emissions. Electric Vehicles emit 40% less CO2 using the UK grid mix and are potentially zero carbon in the future. They have no tailpipe emissions and are a new, but rapidly growing technology attracting investment.

- Air Quality

Road transport is responsible for 45% of London's NOx and 56% of its PM10 emissions

- Low carbon economy

The EV market has the potential to contribute 10-15k jobs and £600m annually to London's economy by 2025

The Draft London Electric Vehicle Infrastructure Strategy includes a comprehensive public network in which no Londoner will be more than one mile from a public charging point.

London's integrated funding model for EV delivery is a public / private consortium led by Transport for London and includes London Boroughs, Asda, BAA, Brunel University, IKEA, Hertz, NCP, NHS, Nissan, Sainsbury's, Siemens, SSE, Capital Shopping Centres, Q Park, Enterprise Rent a Car, Gatwick Airport & Old Ford Housing Association and Southern Railway. A £9.3m grant, awarded by the UK Government, provides 50% match funding for consortium members. Siemens sponsor the back office and IT for the 'Source London' CP network.

The consortium used this integrated purchasing power to developed two procurement frameworks:

1. To purchase up to 1,300 electric vehicles
2. To purchase £30M infrastructure

Both frameworks run until 2015 and bring the advantages of economies of scale, standardisation and interoperability.

The specification for vehicle procurement covers:

•European approved vehicles in vehicle categories (L, M1, M2, N1, N2)
•Minimum emissions standards
•Minimum top speed
•Specified duty cycle
•Minimum all electric range

The scope of the services includes:

•Purchase vehicle
•Maintenance Services
•Spares provision
•Lease vehicle
•Contract Hire of vehicle
•Battery leasing

Companies can be added on to the framework based on their capability to provide a qualifying vehicle over the life of the framework. Actual vehicles are to be refreshed on a 6 monthly basis. Importantly, there is a mixture of companies offering purchase/lease.

Nuno Bonneville from Lisbon examining a CP in London

The Infrastructure Procurement had the following elements and options:

- Standard & Faster
- Rapid
- Standard or Smart
- Purchase and Operate/Maintain
- Purchase, Install, Operate/Maintain

Philippa stressed the lessons learnt so far. There is a need to ensure bodies can call-off (buy EVs/CPs) from the frameworks, and for the consortium to be

able to control call-offs and accumulated spend. It is challenging to write a standard specification that is suitable for all potential users. Take-up issues have included a reticence to sign up to Terms and Conditions, problems with vehicle/CP availability and price in relation to the user budgets.

There are also 'future proofing' issues in the procurement process. It is vital that the specification can accommodate upgrading/retrofitting, emerging models and emerging business models.

Findings in the workshops

Small group discussions gave rise to the following ideas.

Procurement can be an effective tool, to achieve the objective of EV visibility and, above all, to minimise time and effort spent on many smaller procurement exercises.

Bulk procurement can be used to make sure that electric vehicles arrive in a market that might otherwise be overlooked.

These procurements did not result in lower prices. It's hard to lower the prices in a market with more demand than supply.

The procedures are lengthy, time consuming and have many constraints. It can feel like a 'sledgehammer to crack a nut'

The La Poste procurement in France is a different successful model, outside of public procurement rules. EVUE can include this approach in the Procurement Report,

Marianne Mölmen (Oslo) contributing in the workshop

We need to get rid of the 'what ifs?' – the objections to EV ownership. People always say 'what if I want to drive to Scotland?' but of course they never do drive to Scotland anyway.

An important step in the way forward for cities and fleets is to have information sharing, brokerage and a flexible support model to help organisations move towards electric vehicles. Sound, neutral support and advice is really important. There could be new professional service of 'EV Advisors.'

Public procurement rules and regulations can be a barrier to innovation. It is impossible to negotiate with the OEMs. They might have good ideas and solutions that the people writing the specification are not aware of. This does not help to future proof investments

There is a danger that a common specification can become the lowest common denominator.

A good tip is that TFL included leasing companies in the framework, which allows access to EVs from manufacturers who are not on the framework themselves.

Personal experience and test driving EVs for people in influential positions, making decisions about vehicle buying, is key. Get the Chief Executive into an EV!

5 Workshop on Infrastructure

The key questions for cities were:

- What are the key lessons learnt so far with the procurement of EV related infrastructure or vehicles?
- What are the guiding principles for cities for installing EV infrastructure? For location strategy, energy systems, mix and speeds, design, payment mechanisms, incentives and exit strategy.
- How do cities choose on the range from simple to smart systems? Is there an optimum time in the EV adoption curve for different CP architecture?
- How can investment in infrastructure be future-proofed?
- How do cities mitigate against the potential dangers and liability issues around EVs (accidents caused by silence, trip hazards, voltage etc)

The Experts giving input to this session were:

Celine Cluzel of ELEMENT Energy,
Karine Sbirrazzuoli, AVERE, European Association for Battery, Hybrid and Fuel Cell Electric Vehicles
Dr Cristiano Marantes, UK Power Networks

Celine Cluzel of Element Energy[6]outlined the key challenges for cities in relation to infrastructure. Cities and governments feel they have to install infrastructure to break the 'chicken and egg' situation of no charging,-no EVs.

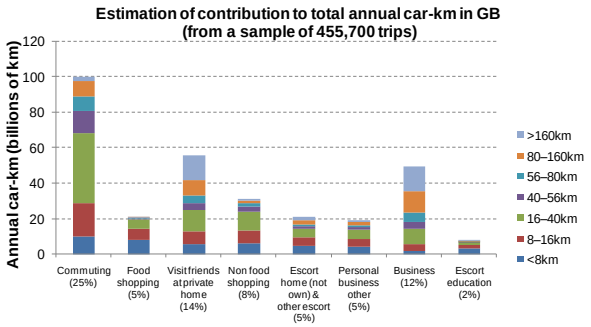
Challenges are numerous but can be broadly grouped into three categories:

1 Cost: what business model(s) and who pays*? (covered in Workshop 1)*
2 Location: where to install infrastructure to fit with user requirements and maximise utilisation?
3 Technology: what technology for future-proofing and to meet consumer expectations?

On the issue of **location** there is a need to meet drivers' needs and maximise utilisation. This means understanding *travel patterns*- where people will want to recharge will depend on how vehicles are used: commuting, shopping, long distance / highway etc .

The length of time spent parked indicates the utility of a charging event: charging rate should be adapted to period spent parked. The time of travel indicates time of start of charging, which needs to be considered for network stability. There is equally a need to understand *consumers' preferences* and the variation of attitudes. The constraints for cities are the value of lost parking space in dense cities, the impact on local electricity networks and the regulatory/planning/landownership considerations.

[6] http://www.element-energy.co.uk/



From this estimation, based on a sample of UK car trips, Celine pointed out that it seems like the majority of trips are within the technical range of EVs. Uptake of EVs in the commuting sector will be key to having an impact on emissions. Estimations of time spent parked show that work place charging can provide utility for commuters using EVs.

From surveys and trials, it is clear that private drivers value home charging most as it brings control over cost, convenience and, security. Workplace charging is second best; convenient for current slow charging rates, predictable driving distance to/from, and available parking. Public CPs are used only if they are widely available, for people without a garage, and very little if they do have a garage.

Celine explained that current EVs buyers are **not** representative of the future mass market: They have home charging and are happy with range for local commutes. The infrastructure they miss and request is inter city / highway fast CPs. On-street charging is not used or only in an opportunistic way – with the exception of public parking spaces used as 'work charging' (e.g. Westminster borough) that are in fact used more for the free parking and electricity than for a real charging need.

In terms of **technology** choice there is no universal standard yet (*see AVERE presentation)* and no universal future proof technology exists yet. High expectations from consumers are for

- Simplicity of use: easy and intuitive to operate
- Simplicity of access: CPs easy to find, access allowed to all CPs
- Secure access: charging will not be interrupted
- Simplicity of payment

In EVUE cities a number of different solutions have been adopted, but the challenges of interoperability, visibility and commercial viability remain.

Responding to these challenges means that cities need to:

- Target deployment or support to level of utility to consumer
- Give a grant for purchase and installation of equipment for home charging
- Support employers in deploying infrastructure
- Understand where employees park if a car park is not provided by the company
- Make sure public CPs are highly visible - easy to find (part of database) - integrated to wider network
- Coordinate stakeholders to ensure interoperability (within and outside of city boundaries) and network stability
- Put 'your' infrastructure to good use by logging the data to bring understanding in how/ when / how much consumers charge up
- Participate in the definition of next generation of charging solutions: help development of new technologies (e.g. >50kW charging, inductive charging) through trial participation or support of trials

Finally, Celine's recommendations to cities were:

- Limit deployment of public infrastructure / target support to most useful locations (study of trip statistics) and state of the art technologies.
- Coordinate current private deployment to ensure integration and interoperability.
- Prepare for deployment of future infrastructure: encourage / participate in trials of new charging systems.
- Think outside the city boundaries.

Dr Cristiano Marantes, UK Power Networks[7]**,** gave the perspective on recharging infrastructure from an electricity distribution company working on low carbon future grids.

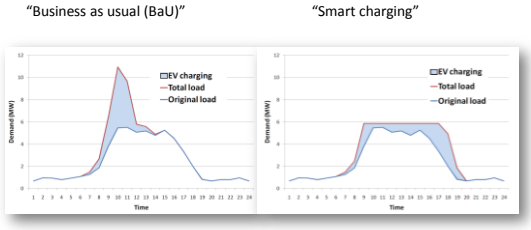
UK Energy policy is focused on reduction of UK's CO2 emissions by 34% (2020), 50% (2025), 80% (2050) (against 1990 levels). Part of the strategy is to electrify heat and transport, with a target of 14% CO2 reduction from transport by 2020 and 'substantial decarbonisation' by 2050. Other key principles are energy security, a strong low carbon economy and affordable transition to low carbon.

Cristiano showed the potential impact of EVs on both home and workplace charging, which shows clearly the importance of encouraging smart changing as opposed to 'Business As Usual' .

[7] http://www.ukpowernetworks.co.uk/products-services/networks/index.shtml

Under a smart operating regime, a large increase in peak demand (and hence a massive network reinforcement cost) can be avoided.

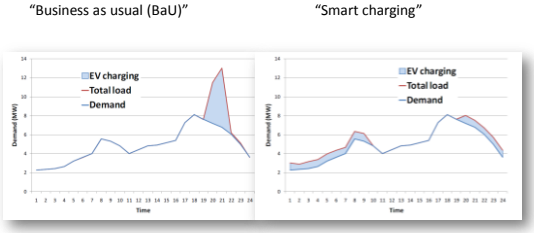
Impact of EV work place charging



- Commercial district (1 km2)
- Charging of 5,000 EVs following arrivals to work

Imperial College London ena energy networks association

Impact of EV home charging



- Residential area (8,000 properties)
- Charging of 5,000 EVs when people return from work

Imperial College London ena energy networks association

Cristiano is leading UK Power Network's actions on Low Carbon London- a large-scale integrated emulation of 2020, with real customers, in order to inform and facilitate the transition to a low carbon economy. The project will ensure that future electricity networks can accommodate widespread use of electric vehicles and heat pumps and includes EV trials to measure charging profiles of different types of EV and how they will impact the electricity network. The specific objectives are to

- Learn what level of EV uptake will create network constraints
- Understand how to anticipate EV charging behaviour
- Extrapolate findings to high levels of EV uptake
- Evaluate coincident EV charging profiles with electricity demand
- Implement Time of Use tariffs to encourage EV charging during off-peak periods
- Implement control functionality to actively manage EV charging

The initiative has a Learning Centre based at Imperial College to share results and data, including

role of the consumer and energy efficiency in smart grids, and recommendations for future network design.

Karine Sbirrazzuoli is Secretary General of AVERE[8], the European Association for Battery, Hybrid and Fuel Cell Electric Vehicles, an NGO founded in 1978 to promote the use of electric vehicles. AVERE participates in a number of European level projects and is part of a global network.

AVERE key topics for 2012 are:

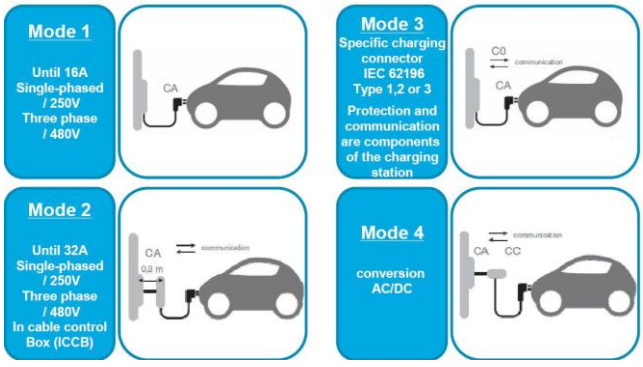
- EVs for fleet and freight transport
- multimodal transport for sustainable mobility
- charging infrastructure: standardisation and business modelling
- ICT for EVs
- consumer engagement for electric mobility

Karine gave an overview of current status and discussions around standardisation for charging equipment. Today, with the exception of Norway, most countries have less than 1000 CPs in operation. Development of CP infrastructure will play a major role in the widespread adoption of e-mobility, and to ensure that this happens successfully there is a need for standardisation, innovation, and business models.

The existing standards and modes are

- Charging modes: IEC/ 61851

- Connections types: IEC/ 62 196



The four Plug modes

There is a battle around the charging modes, pictured here. The French and German OEMs favour mode 3 only charging, with mode 2 as a transitory solution for home charging only. There is user support for mode 1, which is safe enough if used correctly, for example in the case of car heaters in northern countries. For mode 4 fast charging there is currently no European standard, but an industry standard called CHAdeMO, compatible with the Nissan Leaf. Managed modes 3 and 4 allow for an optimisation of energy management, i.e. Smart charging.

For the connection types for modes 1 and 2 standard plugs can be used. Modes 3 and 4 require dedicated plugs and sockets

Overview of AC/ DC plug-in system used worldwide

There is a new combo plug-in system which combines AC/DC fast and slow charging one connection.

The timeline for international standardisation initiatives is:

- **End-2011**: ETSI & CEN-CENELEC is expected to deliver their **recommendations** to the European Commission for a European standard.

- **End 2013:** DC charging standard expected to be released by the IEC.

- **2017:** ACEA's position paper Mode 3 Type 2 & Fast Charging Type 2/Combo 2 .

Looking at the future Karine asked: Can we dream of one plug? Will mode 3 be the EV mode for AC? Will we have different types of charging, like battery swap and inductive charging?

The guiding principles must be that any vehicle can charge safely anywhere.

Karine finished by sharing AVERE's recommendations for cities:

- Experimenting: pilot installations to identify the best locations and modes for charging stations in cities.

[8] http://www.avere.org/www/index.php

- Make sure all relevant stakeholders are involved from the beginning.
- Don't invest too quickly and too much in fast charging stations…
- Choose flexible solutions (eg. in Nice & Paris)

Findings from the workshops

From the small group discussions a number of guiding principles and tips for infrastructure development were proposed:

- Integration: with mobility systems, with urban design
- Accessibility and user-friendliness, eg cashless, using SMS
- Diversity of locations
- Openness to new suppliers
- Efficiency of energy
- Coherence with urban plans and design

Tips for infrastructure

- Study travel patterns, consumer preference and behaviour.
- Assess the cost versus value of on street charging.
- Consider smart charging for long-term sustainability (and commercial viability) and simple charging for initial publicity and awareness raising
- Future proof hard and software by taking a modular construction /design approach with exchangeable parts.
- Prevent accidents with legislation, educational and planning.

6 Workshop on Awareness Raising

The final workshop aimed to tackle the following key questions**:**

- What approach have cities and businesses taken to the promotion and awareness raising of EVs?
- What has worked well? Less well?
- Do cities need an EV communication strategy?
- What education and PR activities support the take up of e-mobility best?

The final two experts were:

Andy Heiron of Renault UK

Robert Stüssi, Mobility Consultant and past President AVERE (European Association for Battery, Hybrid and Fuel Cell Electric Vehicles) and WEVA

Andy Heiron gave a presentation of the Original Equipment Manufacturer (OEM) perspective on growing the market, and Renault's approach to EV. The key drivers for Renault's electric mobility strategy are:

- Rising ecological awareness
- Urbanisation
- Resources supply security
- Regulatory pressure on CO2 emissions
- Government / local incentives

Competition between OEMs is now driving innovation and moving the market towards EV affordability. Partnerships with infrastructure/utilities and separating car ownership from battery ownership, through battery leasing, are part of the game plan.

Renault's prediction is that EVs will constitute 10% of the market by 2020, so 1 million vehicles (accumulated sales). The climate change point of view: WWF (March 2011) is that there will be 1.7m EVs on the road by 2020. Other predictions go as far as predicting 3 million in an "extreme range" scenario (Arup and Cenex report for BERR and DfT (Oct 2008)

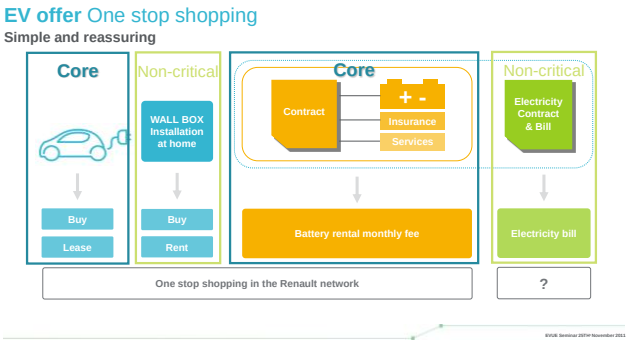
Looking at take up of the UK Plugged in car grant, the good news is it represents an increase of 1009.8% in EVs sold compared to 2010. The not-so-good news is this is a total of 910 cars.

Andy shared one the lessons learnt for Renault around awareness of Evs, which is to make no assumptions. For instance, do not assume

- Everyone knows about electric vehicles
- Everyone understands electric vehicles
- Everyone knows about my brand
- Everyone has driven an EV
- Everyone is a potential customer for an EV

In 2012 Renault launches the Z.E. The marketing strategy incorporates broadcast media communications on key products**,** and mass Ride + Drive campaign so that people experience ZE first hand. Renault plans to grow the specialist (ZE Expert) network to deliver customer experience and will roll out targeted use of a demo fleet. They also want to have a "one stop shopping business"

including car and battery sale or lease and maybe even electricity contracting and invoicing.



Integrated "one stop shopping" concept

Andy emphasised that OEMs need the support of all stakeholders to create the conditions for the market to take off, such as:

Advanced charging infrastructure

- Adopt new European standards (when confirmed)
- Develop national and international clearing and roaming capability
- Anticipate demand-side management and Vehicle 2 Grid enabled charging

Homogenous and non-exclusive charging network

- Avoid local duplication
- Work with OEMs to provide a list of homologated hardware suppliers
- Keep energy costs and access fees low and easy to manage

Innovative mobility offers

- Allow additional 'value added' services e.g. charge point reservation and payment
- Smart navigation to link charging opportunities
- Permit cross-border roaming

Finally, Andy's advice to cities is:

- Take the lead on communications, fleet, and infrastructure
- Implement EV-friendly policies and, planning
- Collaborate with utilities, OEMs,and the private sector

Robert Stüssi, Mobility Consultant and past President of AVERE and WEVA concluded the workshop and meeting with a thought provoking presentation incorporating a number of paradigms, problem and questions. The fundamental question is why awareness raising about e-mobility is important.

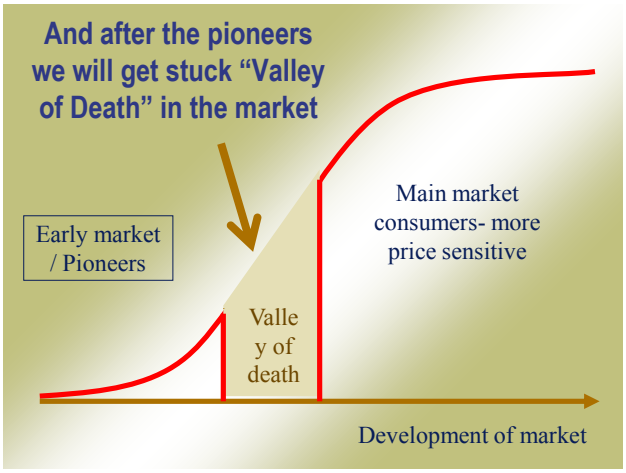


Chart by Prof. Tom Turrentine, University of Davis, California

Early EV adopters are happy to embrace new, green technologies at a higher price, but will the market fall into the 'Valley of Death' on the innovation adoption curve, as the more price sensitive mass market consumers are not convinced?

For cities the transition to e-mobility is part of mobility management. E-mobility is not just marketing, but a new paradigm with new actors and new instruments. There can be both positive and negative perceptions as a result of awareness raising activities, and we need to learn from other sectors, such as public health measures to reduce smoking and obesity.

An honest approach to marketing sustainable travel?

The actions we have seen in EVUE cities and elsewhere to raise awareness include the fun fake petrol pump in Frankfurt, school activities about designing and drawing EVs, having children express their visions of greener mobility, clear messages and branding like the ones on London hybrid buses, zero emission vehicle races and expeditions using cutting edge technologies.

There is a major problem of how much time it takes to raise awareness. Cities need to be conscious that consumer acceptance involves active listening to what people want, to their needs and how they are reacting to new forms of mobility.

A separate report for EVUE by Robert Stüssi on Awareness Raising is available from www.urbact.eu/evue

Findings from the workshop

In the last small group discussions the feedback confirmed that cities need EV communication and engagement strategies to optimise relationships with media, politicians, private sector businesses, schools and residents.

Awareness raising tools for cities can include:

- Maximising visibility of the CP network at key locations, and branding vehicles
- Press releases and photocalls using public figures
- Website information
- Events and road shows
- Use of multi-media.eg. films on how to use charge points, social media sites
- Newspaper articles e.g. in society and technology sections
- Test-drive sessions
- Friendly EV show rooms that are welcoming
- Use Evs at high profile events such as BAFTAs and London Fashion Week
- Involve a broader range of celebrities as ambassadors: younger royals, footballers, soap stars, X factor participants.
- Promote school activities
- Close high streets to do test drives
- Encourage businesses to promote green credentials

Using intermediary agencies to give information, like consumer NGOs, can help to provide a full and balanced picture.

Karine Sbirrazzuoli from Avere test driving the plug in hybrid Prius

Try to match political expectation to reality e.g. not making hasty promises.

In terms of activities to promote awareness of e-mobility it was agreed that more, not less, is better.

7 London 2012 Olympic Games Mobility

An additional guest speaker, **Neil Earnshaw, Sustainable Mobility Manager of London 2012,** was invited to describe the challenges for London 2012 in hosting the world's biggest event.

London needs to provide safe, secure and reliable transport for all visitors. The expectation is that 100% of ticketed spectators will be travelling to competition venues by public transport, walking or cycling. The Olympics should also leave a lasting, positive legacy and achieve maximum value for money. Finally, it is imperative to keep London and the UK moving during the Games.

The station next to the Olympic Park, Stratford, has been upgraded with a number of low carbon technologies, for instance in lighting and escalators. Environmental improvements in the bus fleet include improvements in engine design to reduce pollution and lower carbon footprint. 300 hybrid buses will be in use by 2012. New strategic and venue specific park and ride facilities have been created.

London 2012 has made significant investment in walking and cycling infrastructure with the aim of 5% of spectators walking and cycling to competition events at the Olympic Park and 10% of workforce walking and cycling to work at the Olympic Park.

BMW won the competitive tender to be the Tier 1 automotive sponsor of the Games. They will supply a total of 4,000 cars. Approximately half of the fleet

will be 320 ed (109gCO2/km) Euro V and VI emissions.

200 electric vehicles will be deployed for the Torch Relay, the Marathon, and other Olympic Park operational roles. Models to be used are Mini E BMW 1 Series Active-E, non-standard production models and UPS Modec Vehicles. GE and EDF are providing 120 CPs at fleet depots.

EVUE cities commented that a green Olympics should provide a good opportunity to showcase a diverse selection of clean vehicle suppliers. The sponsorship framework does not allow for this and gives exclusivity to BMW.

The EVUE meeting in London in September 2012 will invite London 2012 to present a post-games evaluation of the performance of the EVs.

8 Learning and Reflections

Reflections from participants at the London EVUE meeting were collected, in their own words, in a post event survey.

Business models

“"Not everyone is a potential EV customer", by Andy Heiron, Renault. Small car makers should be aware of that, and therefore focus efforts in aiming at the right customer segment, which at this point is narrower than a year ago (speaking from the company's perspective).”

“Business models: it is a difficult challenge to build an efficient and compatible charging infrastructure.”

“"A business can learn more from the product itself than from a sales pitch", by Andy Heiron. The activities of a firm may be more representative or descriptive of the nature and purpose (of the firm), than any other action; i.e. providing EVs for testing purposes to government personalities, post office, etc. This gives a more powerful image of the company than marketing itself.”

“Statoil in Oslo charges around 3€ for 10 minutes of fast charging! – that’s good to know!!”

“Charge at home or in workplace. Let's stop blind investment and start looking for travel patterns and focused needs.”

“The discussion on whether to install infrastructure or not, was very enlightening. Though I do not have a clear response, the debate itself is a great source towards finding an answer: it is just a matter of when, and how.”
“The Valley of Death - as described by Renault and Robert Stüssi in the awareness session shows that EV car sales might go down after an initial strong introduction with many sales.”

“Smart charging is essential for planning the future of e-mobility, though large scale implementation might not be as fast as some predict.”

Car Sharing

“Carsharing schemes were a recurrent theme among teams and workshops. They seem to tick many boxes: supporting business models, raising consumer awareness and a path to new mobility.”

“The conclusion in my mind was that car sharing has many benefits for cites, but don’t forget that it´s hard getting people to abandon their one car and join a car sharing system.”

“Car-sharing came up often as a key solution and could be a business model. I agree but I am also in doubt. Car-sharing exist with ICE vehicles and have some members and are fruitful but they are not taking over and dominating or have indications to be very large in the future either. Will actually EVs make car-sharing more attractive or less??? It is car-sharing that makes the development slow. It is not a simple solution of putting EVs in car-sharing and you suddenly attract a lot of people to EVs. There is more to it that that.....”

Infrastructure

“Overall the need for accessible infrastructure is imperative. However the choice of unit and location is significant and needs to be considered carefully. If a city is looking at only a few units and private charging to be the standard, perhaps a simple (type 1), low cost unit is best. In dense urban areas where on-street charging is needed, more complex units may be better to manage the demands of the different environment.”

“The lack of an industry standard is a significant risk so for any units that are installed, consideration is also required to ensure they are future proofed and can be adapted as the situation changes.”

Innovation

“Cities are coming from very enthusiastic back to realistic.”

“London 2012 is like a living lab with the BMW electric vehicles for the Games. There must be a

procedure for data capture to collect and share knowledge of their performance."

Procurement

"The procurement processes are interesting, and the problems and challenges that all the cities are finding to set up a really useful network of CPs, which is directly linked to the possible business models to come in the future."

"Focus on the "sweet spots"."

Awareness raising

"I was fascinated by the idea of doing "marketing" activities with new generations; i.e. targeting kids and teenagers with activities at in schools. That is to me a great idea, and with an enormous impact."

"Awareness raising is important in all our partner cities - car prices are the biggest barriers."

"The success of EVs depends on personal experiences: give people the chance to drive EV's."

"Keep up the communication and dissemination - "kill all the phantoms about EV's!""

"Very interesting to see - from their questions and reactions - what information is useful to 'city planners' and not necessarily available to them, in particular: evidence of (low) level of utility of public charging points for consumers and the distribution network aspects?"

London meeting format

"The workshops and the group interactions were fantastic, very interesting and fun."

"The level of interaction in the group is great and fosters productive exchange and ideas generation."

"The format: expert presentations followed by active workshop sessions worked particularly well the second day as people got used to format and the subjects (consumer awareness and infrastructure) were easier to frame and better defined than the previous day (business models)."

"The workshops were great. They were very well organized, changing the members every time and dynamising the sessions. It was good to bring all the topics together compared to the normal meetings of focusing on one aspect only."

"The way the workshops were done, providing a really transnational gathering of all the different state of the art of each partner. And allowing the discussion and participation of everyone. It seems at each meeting we're getting better."

EVUE partners ideas on how to transfer the learning and ideas from the London seminar.

"We can create a website dedicated to electric cars. We want to focus on the promotion of electric vehicles in Katowice."

"The most important point was the confirmation, that awareness raising is more important than creating infrastructure."

"How to know what is the right thing to do? Impossible! Indoor or outdoor charging, simple equipment or very advanced? It is impossible to know what is right! I would say everything is right! To do nothing and just wait is wrong!! We need to start the work, be brave and try different things and be prepared to do wrong actions and investments. Fail, Fail again - fail better!! We learn from failure too. The biggest failure is to do nothing and wait!! Be brave!!"

"Promote driving tests (focus on youth generations)."

"All e-mobility stakeholders must be working in collaborative projects."

"Find the right EV for each purpose and need (2 wheeler, tizzy, car-sharing, logistics, etc.)"

Conclusions from the London seminar

From the key leanings described above, there are opportunities to follow up that would benefit all cities:

Distribute information to all cities.

Study existing car sharing schemes to assess if impact is as good as hoped and understand what works best.

Use the examples of London and Stockholm in procurement processes in order to comply with EIB requirements (MADEV-ELENA project).

Look out for the next European calls (ERDF, ESF, FP7, IEE) and the possibilities for EV activity.

Implement some communication and awareness raising campaigns, including the possibility of recording a video to be included in the web, as well as surveys to be launched among EV users.

Develop an integrated vision to disseminate electric cars connected to urban planning.

Transfer from large to medium sized cities. Beja is particular in the project in terms of size and economic profile, but it represents the majority of European mid-sized cities. Thus, the examples from large cities have to be adapted to Beja's reality and translated to that majority of towns, in order to fulfil our role in the project. Transferring models is more a transversal process than focusing in a specific idea, model or experiences.

The year of 2013 will be the European Year of Air. In the next meeting, plan for activities related to the topic and EVs.

Use this last project year to transfer results, models, principles, references or practices to other cities. In this process, universities and spin-off entrepreneurial ventures should be privileged as vectors to disseminate project results, in addition to the direct dissemination among other urban authorities.

9 EVUE in 2012

There will be a joint Oslo-Stockholm Study Visit and Network meeting in the week of 21-25 May 2012.

The EVUE Final Event will take place in London in the week of 24-28 September 2012.

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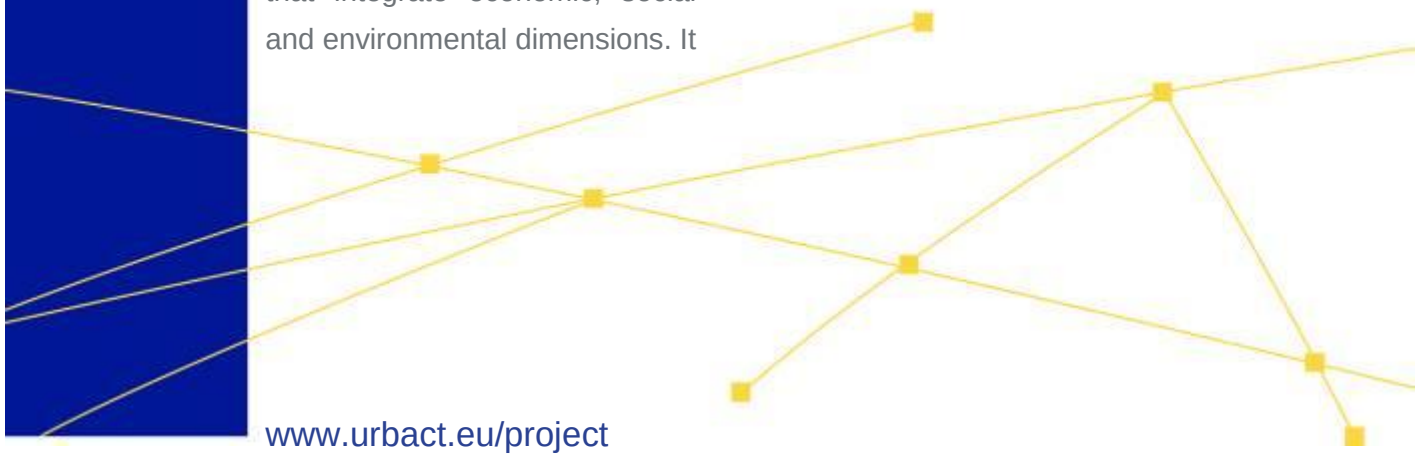
URBACT II

URBACT is a European exchange and learning programme promoting sustainable urban development. It enables cities to work together to develop solutions to major urban challenges, reaffirming the key role they play in facing increasingly complex societal challenges. It helps them to develop pragmatic solutions that are new and sustainable, and that integrate economic, social and environmental dimensions. It



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