



# Expert Perceptions of Barriers and Opportunities for Shared Electric Mobility

## A Knowledge Transfer Workshop Report

Sharing experiences among car sharing operators provides a current update of the needs and expectations of active practitioners in the field. Their views on what helps and hinders the expansion of shared electro-mobility in the UK with focus on Wales were extensively discussed at the workshop and summarised in this report.

A Carplus – eBRIDGE joint event



### eBRIDGE: Empowering e-fleets for business and private purposes in cities

<b>Programme</b>	STEER
<b>Project number</b>	IEE/12/713/SI2.644746
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# Table of Contents

- Introduction .....3**
- Knowledge Transfer workshop .....3
- Presentations .....5
- Main findings: Round Table Discussion Groups .....6**
- Barriers for the proliferation of EVs.....6
- Opportunities from the proliferation of EVs .....9
- Conclusions and Next Steps .....11**
- Speakers' Biographies .....13**



## Introduction

eBRIDGE is a collaborative project with 13 partners from six countries, aiming to demonstrate that fleet schemes can aid the proliferation of electric vehicles in urban and rural areas; this is expected to result in improved market conditions for electric mobility.

As part of the wider project outcomes, we strived for high exposure for the project and its findings, through knowledge transfer and expanding networks. On this backdrop, Cardiff University, as the site leader for the Carmarthenshire County Council pilot project wished to disseminate the project findings to other councils (local authorities) in Wales, as well as to explore their views on car pools, electric mobility and car sharing.

At the same time, car sharing – in all its manifestations – has been generally increasing in recent years; be it in the guise of sharing lifts with others, becoming a member of a car club and so sharing the use of a car with others, or even sharing the ownership of a vehicle as in the case of peer-to-peer car sharing. Giving up exclusive individual car ownership is a big step for the general public, as is transitioning to electric propulsion with its associated barriers and benefits.

Realising that electric fleet proliferation and car sharing expansion have more commonalities than differences, eBRIDGE and Carplus, the British NGO that is the leading advocate for car sharing, decided to organise a common knowledge transfer networking workshop on the potential for car club development, with emphasis on electric mobility, its particularities, barriers and opportunities – with a focus on developing shared transport solutions in a Welsh context.

## Knowledge Transfer Workshop

The workshop took place on 12<sup>th</sup> November 2014, hosted by the School of Psychology, Cardiff University and was led by Dimitrios Xenias (eBRIDGE) and Chas Ball (Carplus). It attracted over 25 hands-on practitioners of shared mobility, electric mobility or a combination of both, from the public as well as private sector. Mobility-relevant NGOs and the Climate Change Commission for Wales were also represented in the workshop. Specifically with regards to Welsh authorities attending the workshop, there were representations from:

- Swansea County Council
- Swansea City Council
- Carmarthenshire County Council
- Bristol City Council (England)
- Pembrokeshire County Council
- The Welsh Government



This represented a good geographical spread around Cardiff and South Wales, while the presence of Welsh Government representative ensured that at minimum there is awareness about electric vehicle (EV) and car sharing at a government level.

The workshop was planned as a three-part event:

- The first part comprised on-site (kerbside) demonstrations of the pick-up and return procedures for two car-clubs: City Car Club, by Chas Ball, and Co-Wheels, by Pierre Fox.
- The second part of the workshop comprised presentations from different operating car sharing and EV schemes, as well as early findings from eBRIDGE.
- The third part comprised discussion groups focusing on opportunities and barriers for the diffusion of EVs, with emphasis on the particularities of the Welsh context.



**Chas Ball demonstrating collection and return of a pre-booked City Car Club vehicle.**

## Presentations

The second part of this workshop accommodated 10 short presentations on various topics.

In order of appearance, Chas Ball, chief executive of Carplus opened the event by providing an overview of the current status of car clubs in the UK, and the potentials for electric mobility independently and as part of shared fleets. James Finlayson, managing director of City Car Club, and Pierre Fox, Director of Co-Wheels car club outlined the basic aspects of their respective schemes. Dimitrios Xenias then presented eBRIDGE project, its structure, partners and projected outcomes, while Neal Thomas managing the corresponding UK pilot scheme in Carmarthen, Wales, focused on that project and synergies with eBRIDGE in more detail. Chris Morris, managing director of E-Car club, the first entirely electric car club in Britain, explained their business model and particularities compared to a conventional car club. Chas Ball concluded this session by outlining some basic advice on starting an electric car club, and lessons learned from a consultation on setting up a electric car club in Newport, South Wales. Three shorter presentations by Morag Haddow from Carplus Scotland, Andrew Capel from Llani Car Club in Llanidloes, and Vicky Moller from Cilgwyn car club provided updates from on the state of the rural car club sector in Scotland and Wales.



**Dimitrios Xenias presenting at the knowledge transfer workshop.**

The full presentations from the workshop are available in CarPlus website at: <http://www.carplus.org.uk/shared-transport-cymru-growing-car-clubs-and-shared-e-mobility-in-wales/?page=CiviCRM&q=civicrm/event/info&reset=1&id=13>



as well as the eBRIDGE website at:

<http://www.ebridge-project.eu/it/news-events/165-one-day-workshop-in-cardiff-university>

Speakers' biographies can be found at the end of this document.

## Main Findings: Round Table Discussion Groups

The next session was dedicated to the in depth exploration of issues relevant to the current perceived barriers and opportunities for the expansion of electric vehicles, mainly from the perspective of local authorities.

### Barriers for the proliferation of EVs

The first question for the discussion groups looked at identifying current barriers for the expansion of electric vehicles, and potential measures that would support further local EV deployment. Emerging points from these discussions are summarised below:

#### Charging infrastructure

- By far the most important issues for this discussion group related to charging infrastructure. Participants found that frequent issues with current charging infrastructure are that chargers are sometimes not reliable, not interoperable, not easy to use, or some combination of the above. Specific examples provided included the following:
- *Compatibility issues are still evolving*: Some types of chargers do not recognise some types of vehicle. At least one particular car model and one particular charger model were identified.
- It was also reported that some chargers fail just because an incompatible type of EV was plugged in, resulting in the charger needing repair. From a practitioners' point of view, this is unacceptable because it is a technically preventable failure, which is easily predictable, and expected to be foreseen given the level of sophistication and cost of these chargers. One fleet manager described it "*as if you have to re-wire your whole house because you plugged in the wrong brand of toaster*".
- To add to the previous complication, some chargers can only be repaired by specialists located abroad, adding to costs and delays in the repair, frustration and expenses to the operator, and loss of confidence for the drivers.
- *Some chargers and charging systems are harder to use than others*: users find that some chargers are less intuitive than others, and provide one or more of the following:
  - Confusing instructions (e.g. connect the cable to the EV or to the charger first, whether to swipe the charge card before or after connecting to the charger).



- Confusing feedback in some car/charger combinations (e.g. appearing as if it the EV is charging when it is not).
- Where the charging cable is carried in the car, this adds to the possible complications with charging-users prefer the chargers that have the charging cable already attached on them.
- *There are urgent calls for standardisation of charger types and communication protocols with the cars:* Manufacturers' standards differ and there is no guarantee that the next available charging point will be suitable for the next car.
- Currently, each car and charger manufacturer can have their own standards, which complicates matters.
- Government stance (e.g. via the Office for Low Emission Vehicles) stance on this, is 'laissez faire' and lets the market sort it out. This is not helpful as buyers, councils, fleet operators and even manufacturers expect some government leadership via the imposition of standards.
- Standardisation appears to be a global problem, but the proponents of a "VHS versus Betamax video systems" dialogue on transitions and evolving technologies, seem to ignore that personal transport is not the same as personal entertainment, which was the case with the video system example, as one participant put it.
- It becomes clear that just as with petrol pumps, chargers must be *reliable, interoperable, and easy to use*-even more so for the new user, which will possibly comprise the majority of car sharing users who might be driving a different EV model than they would otherwise. If these issues are not rectified, they will only exacerbate current perceptions of public chargers as unreliable.

### Locations for charging points

- These must be carefully and strategically selected – for instance in frequented locations with nearby points of interest. On the contrary, locating chargers in quieter, less busy locations e.g. to avoid adding to existing congestion, will almost certainly also lead to the under utilisation of the charging point.
- Public spending for chargers must be justified by usage. Some local authorities seem to purchase and install charging infrastructure without thorough research on charging demand in that area. This may result in waste of investment, e.g. installing a charging facility where no one can use it.
- The actual location of public chargers is often not known – applications such as Zapmap can help.



## Responsibilities

- Responsibility for funding for cars and chargers is currently confusing and fragmented – for instance OLEV has passed this on to local authorities, and their decisions are not uniform.
- Responsibilities and rules for installers (e.g. British Gas) are also fragmented, so that the installer might not be able to install a charging point in some areas/types of road/types of property depending on whether they are considered public/private/council land, on or off the highway and so on.

## Charge level of the car battery should be monitored

At least one of the schemes participating in our workshop actively monitors whether the EV is adequately charged before releasing it to the user, and also directly contacts the user if they did not connect the EV properly and is not charging when they deliver it. It seems that a policy of considering the rental time active until the car has started charging, is effective against inconsiderate drivers who might be tempted to leave the car uncharged.

## Clear direction

Local authorities are very eager for the Welsh government to take a clear stance as to whether they support electric mobility or alternative technologies (e.g. hydrogen cars) instead.

## *Private car clubs have these further points to address*

- **Insurance:** a reform of insurance policies and options for shared cars is necessary to simplify the process – e.g. not having to name drivers in the policy contract.
- **Affordability** of the vehicle/fleet and fitness for purpose.
- **Vision:** when creating a car club, it is necessary and motivating to have a clear vision of what the club is going to be like, why it is good to have it.



**Chas Ball leading one of the discussion groups.**

## Opportunities from the proliferation of EVs

The second question for the discussion groups looked at identifying opportunities in the process of EV fleets and car clubs expansion, and supportive measures needed, with emphasis on Wales. Emerging points from these discussions are summarised below:

### Familiarisation and behaviour change

- Car clubs – especially electric car clubs - are a *great way to familiarise* drivers with EVs, as well as with car sharing; especially for people who would otherwise never have this experience.
- They can also encourage the change of culture towards more shared use of vehicles, and the adoption of EVs. By focussing more on trip planning and trip evaluation the default position should be to use a small car or an electric car if available and this could be part of a travel hierarchy set out for employees

### EVs are clearly cost effective for mid-to high mileage

They might only prove uneconomical for light use. One particular operator estimates their break-even point at just 18% utilisation of the car.



## Financing

- For Wales, this is an opportunity to learn from England and Scotland, and avoid earlier mistakes, e.g. through OLEV's provision of a fragmented funding structure. The funding structure can and should be reformed in Wales.
- There were urgent calls for simplification and rationalisation of the funding procedures and opportunities: the current system does not work very well.
- Most local authority EV schemes do not know how they will maintain their schemes (cars and infrastructure) after initial government grants expire. Current markets will not contribute enough to keep schemes running, e.g. to pay for the maintenance of charging infrastructure. If government shows more initiative and clear leadership (e.g. long term commitment to the schemes) then operators (councils) can more confidently make decisions about their future (e.g. inclusion in five-year travel plans) and expand the base of the market.

## Political leadership

For instance one local authority is working on developing their travel plan and they need clear advice on whether they will continue receiving support for using EVs (e.g. closed or open scheme) and to what extent (e.g. keep existing fleet? expand it? go all electric?). In this situation, with the prospect of major OLEV funding being provided for cities to adopt more substantial e-mobility plans, government needs to take leadership in setting priorities which would hopefully include shared use vehicles available where appropriate for multi-agency and public use. These decisions cannot easily be made without a clear government stance, especially on charging infrastructure.

## Integration in transport fabric

Car clubs – electric or not - cannot “stand alone” but can only operate as part of a transport mix, with a role of complementing other sustainable transport modes. In setting a business travel hierarchy walking / cycling / public transport work for short trips; shared use EVs work for local distances under 80 miles round trip (comprising the majority of trips). For longer journeys rental cars are an option as is public transport (e.g. trains)

**Careful evaluation** is necessary for targeted interventions to achieve results. For trial schemes or policy measures, it is impossible to determine their success and lessons learnt, without evaluation. Otherwise, the continuation of an unsuccessful scheme, or even withdrawal of an actually effective measure is more likely.

**Secondary market** is evolving for EVs, which will gradually attract private car rental companies as well. So far car rental companies have shied away from EV adoption due to the uncertainties of reselling used EVs: in their business model many rental companies only keep their cars for less than 1 year. Until now they would not have been able to resell their



used electric cars elsewhere. But since the batteries are built to outlive the car, this may now be changing, if the infrastructure problems are solved and users can more confidently and conveniently use their EVs.

### **Is there ‘best practice’ advice for Welsh local authorities?**

- It is not easy to currently define ‘best practice’ as there is very limited experience on this topic.
- One important action, as Carmarthenshire County Council did, is to clearly identify a need in a clear context: in this example, substitute diesel miles for electric miles in a controlled environment with a known demand after careful audit. This was a successful and targeted measure, and could form a successful basis for similar sites.

**By opening such schemes to mixed (council / public) use**, there may be hesitation regarding some key issues to be resolved, including insurance, liability, and charging points issues, some of which are outlined above. However, the experience accumulated by Carplus elsewhere in Britain of successful shared use EVs and by eBRIDGE from schemes in the rest of Europe such hesitation may be misplaced.

**Gradual and sustained work and commitment is needed – change is not going to happen overnight!**



## Conclusions and Next Steps

This brief report outlined the main aspects and outcomes of the common eBRIDGE – Carplus Knowledge Transfer workshop on electric and shared mobility. This was a unique opportunity to bring together practitioners from this sector, learn from each other experiences, and identify the current needs and priorities for the future of shared electric mobility. By far the most important outcome was our participants’ identification of the need to standardise charging infrastructure across the country, before further steps can be taken for the spread of electric mobility either in fleets or by individual ownership. There was also a clear call from local authorities to central government to take a clear stance on whether there will be further support for EV schemes in the next few years, and how this support might materialise.

In addition, the findings from the discussion groups also supported earlier findings from eBRIDGE (see deliverable 4.1 – “Summary of formative evaluation”) from the user perspective: drivers’ attitudes towards EVs are generally positive; EVs are not ‘one size fits all’ vehicles, but operate better within targeted –usually light goods or personal transport–uses; and car sharing schemes are necessary if EV use is to be broadened and increased (contrary to supporting schemes that subsidise individual EV ownership). Weaving together the results of the present and previous exercises, helps put together the bigger picture on EV expansion from an applied perspective.

One notable – albeit intangible – outcome of this event was the intense exchanges and networking that took place during the breaks and discussion times. Since the audience comprised exclusively practitioners or aspiring practitioners of shared mobility and electric mobility, very focussed exchanges were generated. There was a lot of discussion on comparing experiences between projects, ideas about improvement and best practice, lessons learned and future steps. The author is also aware of several additional communications that took place between participants in the days following the event. These were perhaps the most important results of this knowledge transfer event.

The main findings of this exercise will also feed into a mapping exercise report independently prepared by Carplus for the Climate Change Commission for Wales. This will not only increase the visibility and dissemination of the project outputs, but also reaches an audience which is well placed to effect change in this area. The Climate Change Commission for Wales is a crucial link between government and everyday people and their activities; and a very useful forum for the translation of government policy into action, as well as for feeding the concerns and needs of lay people into the heart of policy making.

Increasing electric mobility as well as shared mobility is a multifaceted problem which cannot be easily solved by any one party. Instead, coordinated, sustained effort and commitment at the highest levels of government will be instrumental if we are to see any measurable expansion of EV fleets in the coming years.



## Speaker biographies

### **Chas Ball, Chief Executive, Carplus**

Chas has been Chief Executive of Carplus Trust since April 2011, having joined the Carplus team on a part-time basis in 2009. His experience in the car club sector is extensive. He was also involved in setting up a community-based car club in Leeds from 1997. In 1999, Chas co-founded City Car Club (originally called Smart Moves), which he left in 2007 having led the work in pioneering cities such as Edinburgh, London, Bristol and Brighton over the early years.

Prior to joining Carplus, Chas researched the opportunities for developing the car club sector in Scotland for NGO Transform Scotland, as part of running a transport consultancy. He is a member of the Transport Planning Society.

### **James Finlayson, Managing Director, City Car Club**

James is an entrepreneur who came to City Car Club as a business angel investor, after selling a long standing horticultural services company that he founded. He was drawn to the business as it ticked his green boxes as well as being in a new rapidly growing sector, technology and marketing led, at the forefront of the sharing economy and a market that had huge potential.

Within a year of investing in City Car Club, James took the helm of the business in 2007 and has been instrumental in commercialising and rapidly expanding the company, turning it from loss-making to a profitable and sustainable business model within 5 years, making it just one of the few profitable car clubs in the world. Privately owned, City Car Club now operates across England, Scotland and Wales, has over 30,000 members and a fleet of approaching 850 vehicles making it the UK's largest independent car club operator.

### **Pierre Fox, Director, Co-wheels Car Club**

Pierre Fox is a Director of Co-Wheels car club having previously worked as a travel project manager within NHS and local authority settings. Pierre has used this experience to shape a specialist service provided by Co-Wheels aimed at organisational usage.

### **Morag Haddow, Car Club Development Officer (Scotland), Carplus**

Morag Haddow works in the Carplus Scotland office, delivering the Transport Scotland funded Developing Car Clubs in Scotland (DCCS) programme.

Morag joins Carplus from local development trust Sustaining Dunbar, where she worked with schools, businesses and community-led groups to promote alternatives to private car use. She also founded car club SpareWheels in 2011 and is also working towards an MSc in Transport Planning and Engineering.

Shared Transport Cymru – growing car clubs and shared e-mobility in Wales. November 2014



**Chris Morris, CEO, E-Car Club**

Chris is the Co-Founder and Managing Director of E-Car - the UK's first entirely electric pay-per-use car club.

Chris has overseen the E-Car development strategy since inception and remains responsible for general management, partner engagement, project development and relationship management along the supply chain. He has also been heavily involved in the company's fundraising activity which has seen over £1,000,000 raised from a combination of non-dilutive public sources, crowdfunding and more traditional institutional investment. Following an investment from the Centrica-backed Ignite Social Enterprise Fund in early 2014, Chris is now leading E-Car's expansion across London, East and Central England.

**Neal Thomas, Business & Support Officer, Transport & Engineering, Carmarthenshire County Council**

Neal has been a Business Support Officer for the Transport & Engineering Division within Carmarthenshire County Council since 2008. The position provides direct support to the Head of the Division with the provision of business support in order to develop and deliver performance management, systems, communication, financial reporting, research and ad hoc projects.

The Council have incorporated Electric cars within a Pilot Pool Car Scheme and Neal's role has involved monitoring and analysing their performance. He is also involved as a direct contact, supporting two European based projects ENOVATE and E-Bridge at Cardiff University.

**Dimitrios Xenias, Research Associate, Cardiff University**

Dr Dimitrios Xenias is a social and environmental psychologist, focusing on sustainable travel and associated behaviours such as mode choice; on domestic energy related behaviours; and on perceptions of climate change and its communication. He is a Research Associate in the School of Psychology at Cardiff University, UK. Dimitrios is also an associate of the Tyndall Centre for Climate Change Research; and a Research Affiliate in Cardiff University's Sustainable Places Research Institute.



## The Project

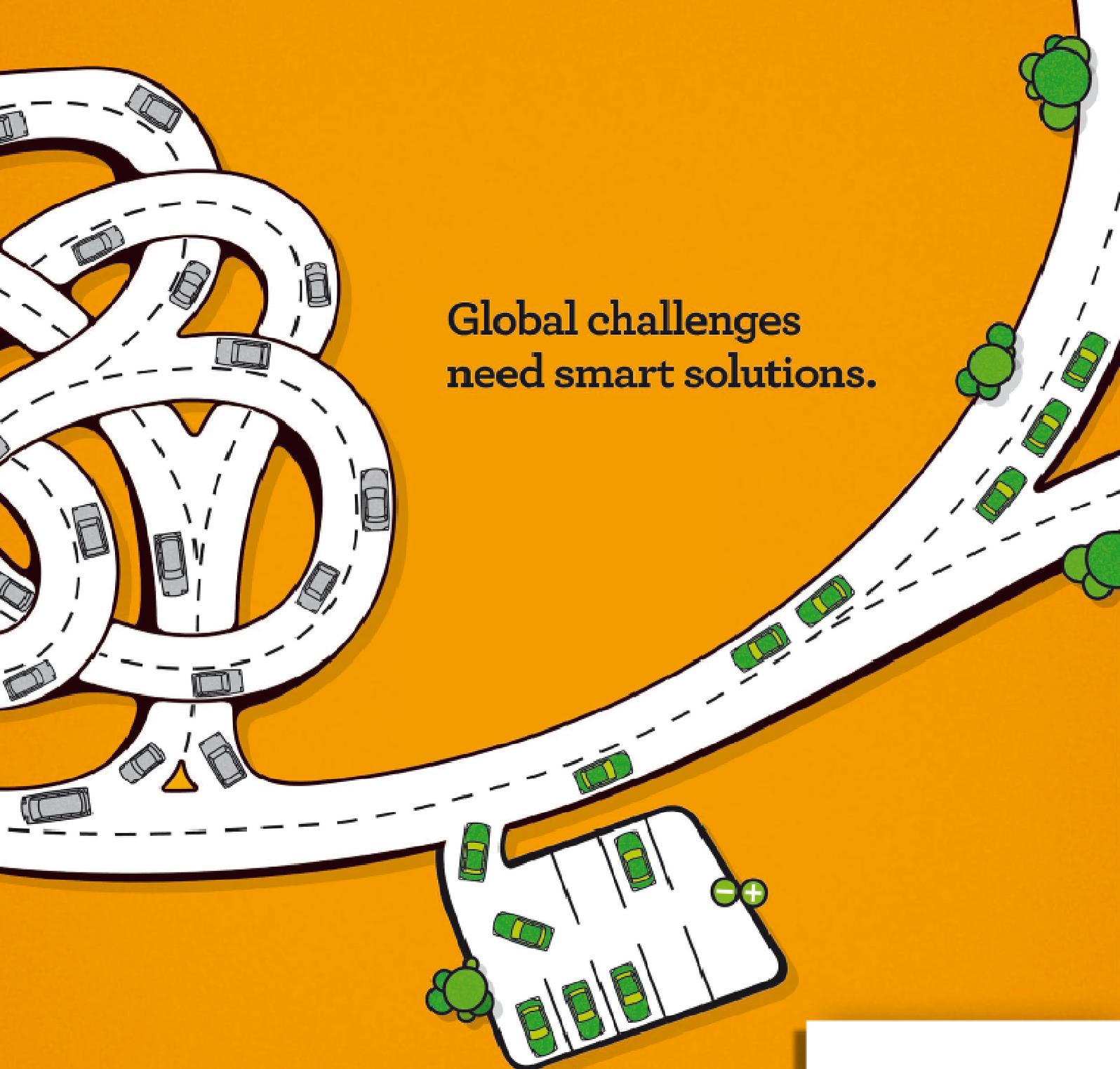


eBRIDGE is a co-funded EU project to promote electric fleets for urban travel in European cities. The project aims to bring innovation and new technologies to make today's mobility cleaner, more efficient and sustainable.

The project explores alternatives to the current mobility patterns and evaluate whether electric mobility is a feasible option to make cities cleaner and more sustainable.

The seven pilots, Berlin (Germany), Milan (Italy), Lisbon (Portugal), Vigo (Spain), Valencia (Spain), a selection of Austrian municipalities and Carmarthen (Wales) are developing actions to optimise operational fleet performance, test and launch solutions to increase the convenience and ease of use of car sharing offers and finally, raise awareness among the target groups through engaging marketing approaches on the suitability of electric mobility for urban transport and commuting.

The eBRIDGE team involves technical experts, academics, associations, public administrations, mobility providers and public transport and car sharing operators.



# Global challenges need smart solutions.

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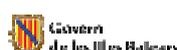
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Power to urban fleets



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