



Electric Vehicles Can Make Cities Smarter: A Global Perspective

Northumbria University Research Seminar

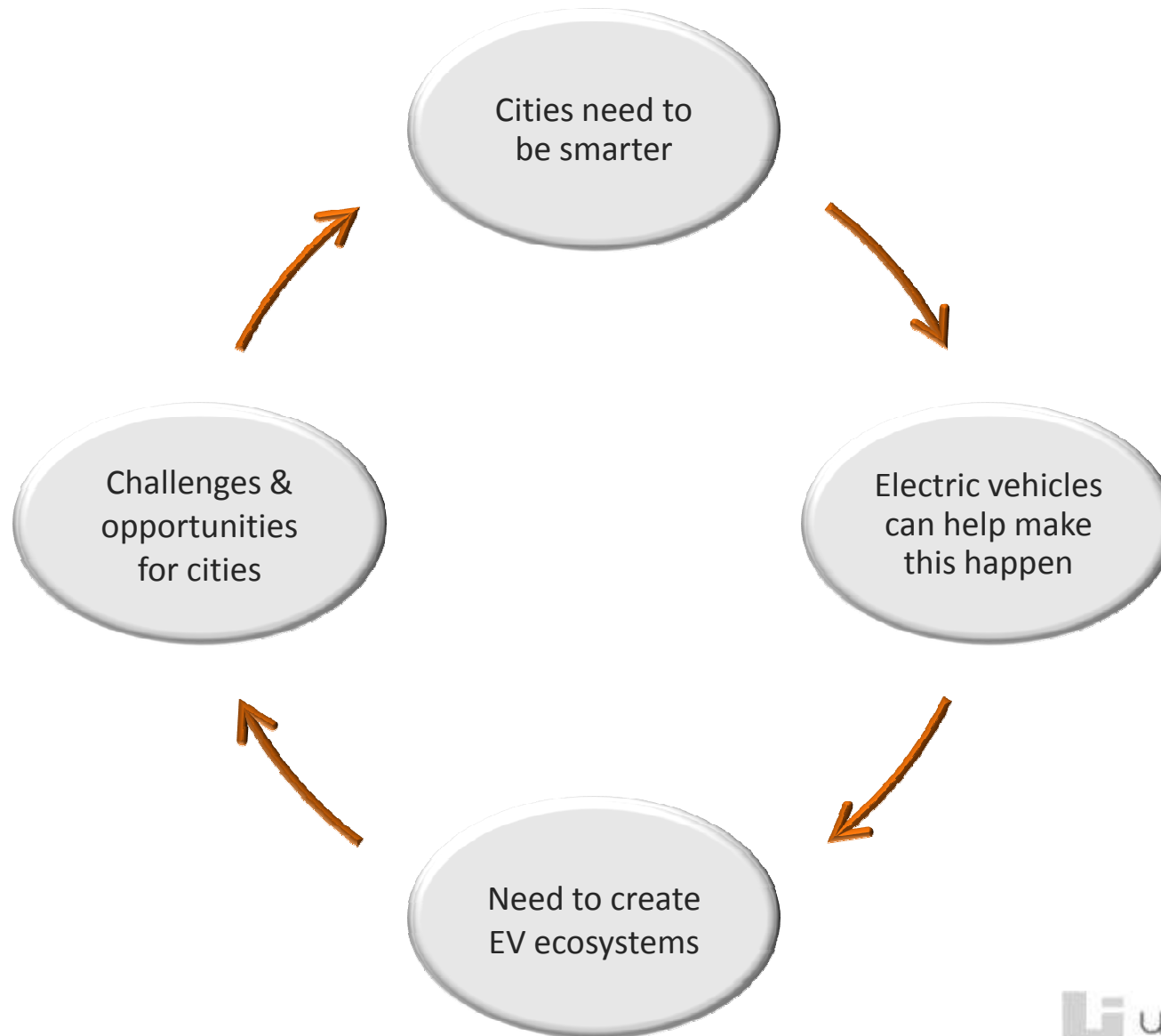
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18 January 2012

Overview of presentation

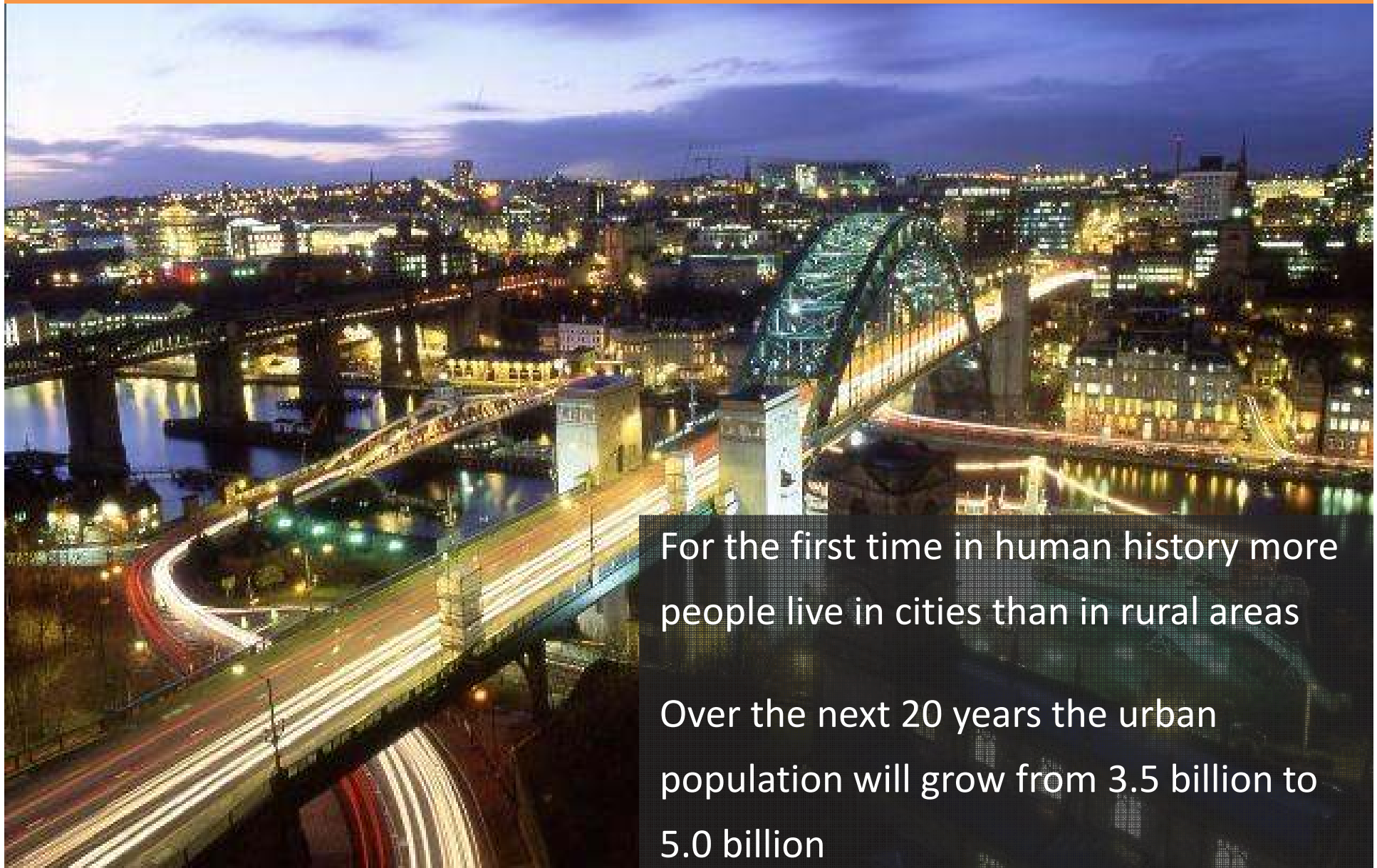


This is not a car



Cities need to be smarter

Cities need to be smarter



For the first time in human history more people live in cities than in rural areas

Over the next 20 years the urban population will grow from 3.5 billion to 5.0 billion

Cities need to be smarter

The social, environmental and economic challenges of this transformation will shape the 21st century.

Opportunity:

- Reduce the impact on the environment
- Sustainable economic growth
- Improve the lives of citizens



Cities need to be smarter



For the last 100 years the car has shaped the future of cities

Now cities are shaping the future of the car

The electric vehicle opportunity

Evolution



1830 to 1930s



1960s to 1990s



1990s to 2008



Office for Low Emission Vehicles



2008 to 2010

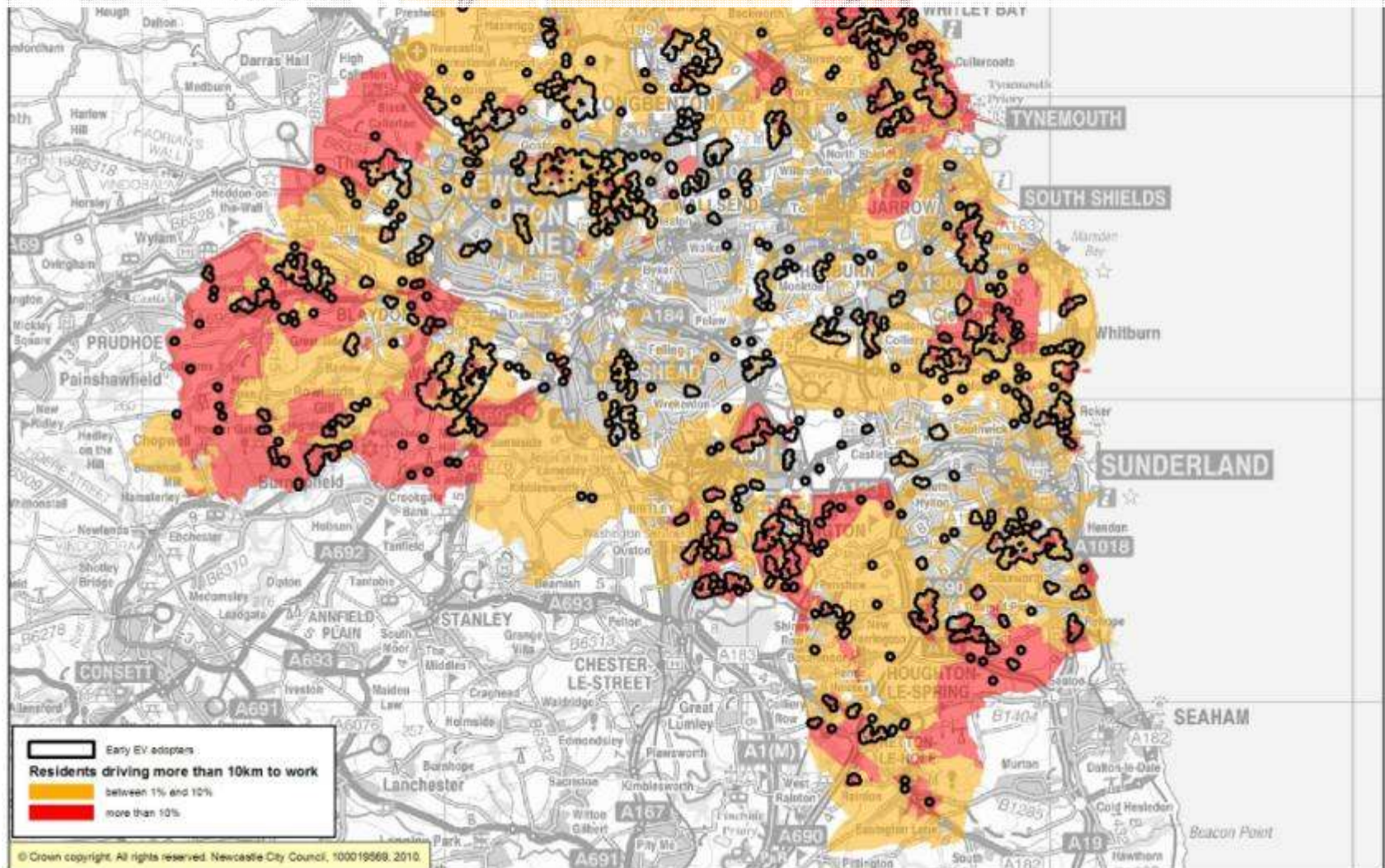


2010 onwards

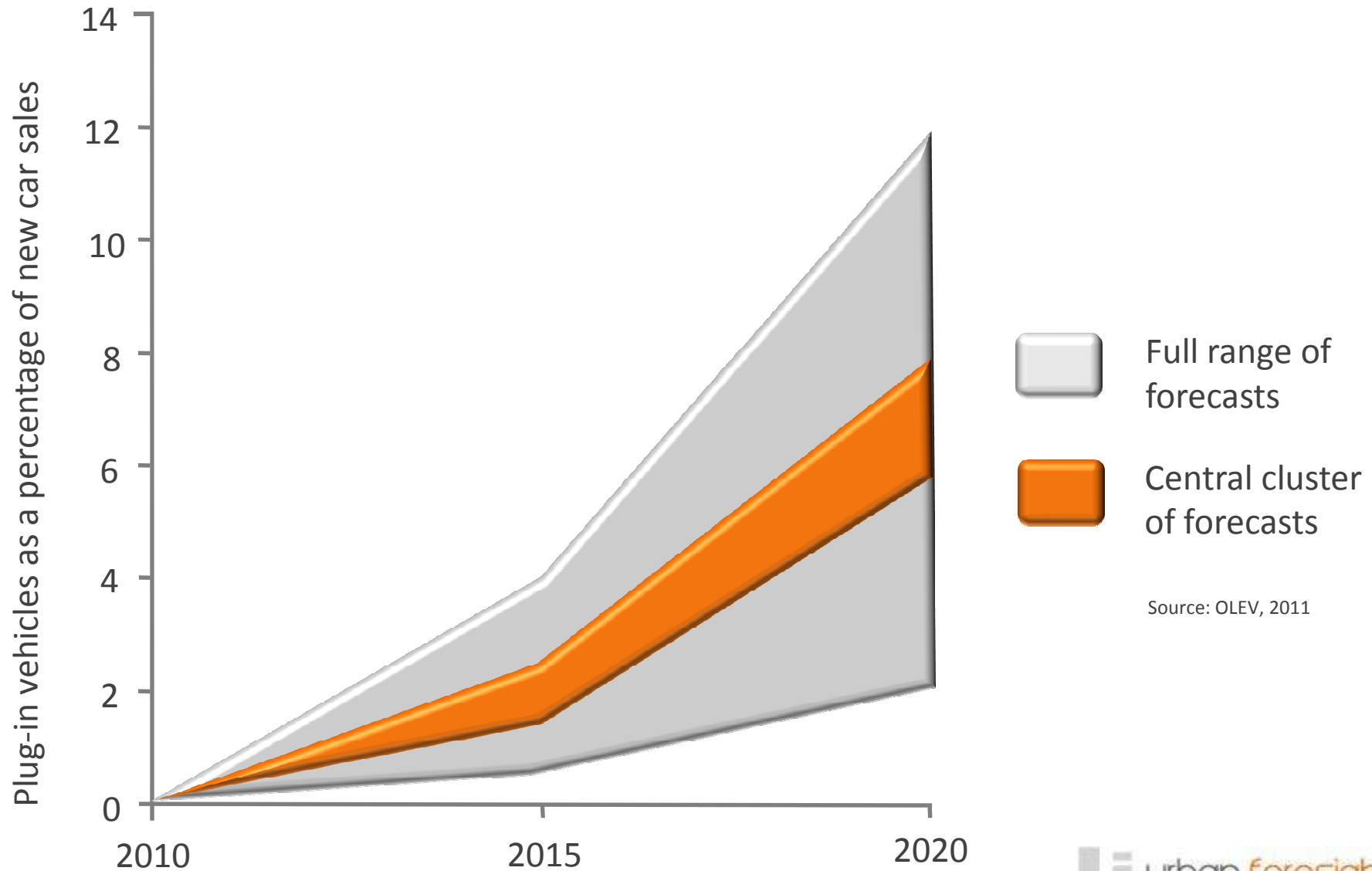


Drive >100 miles on a single charge

Around 80% of all trips and 44% of the total UK mileage is by vehicles that complete a daily distance of less than 40 miles (Element Energy, 2009)



Estimates of EV market uptake in UK



Why electric vehicles are important



Emissions reduction

- Binding targets to reduce the UK's greenhouse gas emissions by 50% by 2027 and Government recently committed to achieve 80% by 2050
- European regulatory framework: by 2020 new cars will emit 40% less CO₂ than in 2007
- Air quality



Energy security

- Reducing dependence on finite fossil fuels
- Supporting case for low carbon energy generation
- By 2020 renewables will provide 30% of UK electricity



Green Growth

- Automotive accounts for 12% of UK manufacturing employment and is UK's number 1 manufactured export
- Opportunities across wider value chain

Why EVs are important to North East

Major automotive manufacturing region



Leading developments in energy and green technologies



North East EV programme



£7.8m Plugged in Places project:
1300 charging points



Rapid charger network



Residential charging trials



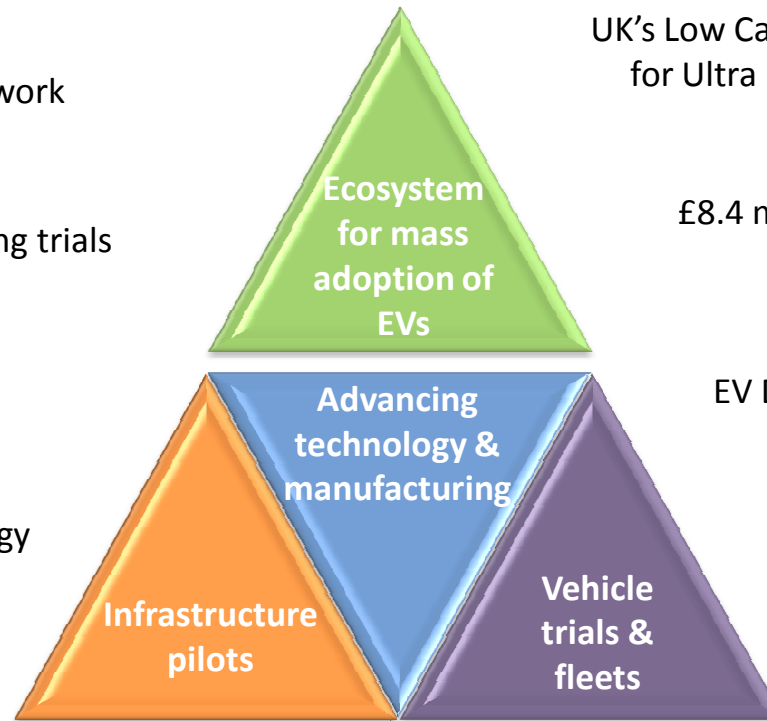
Back office & administration



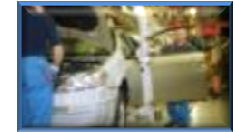
Advancing new charging technology



Smart grid & network investigations



UK's Low Carbon Economic Area for Ultra Low Carbon Vehicles



£8.4 million National Skills Academy for EV



EV Development Centre & Test Track



£54 million smart meter & EV charging pilot



EV procurement programme



2009 Smart Move Trial

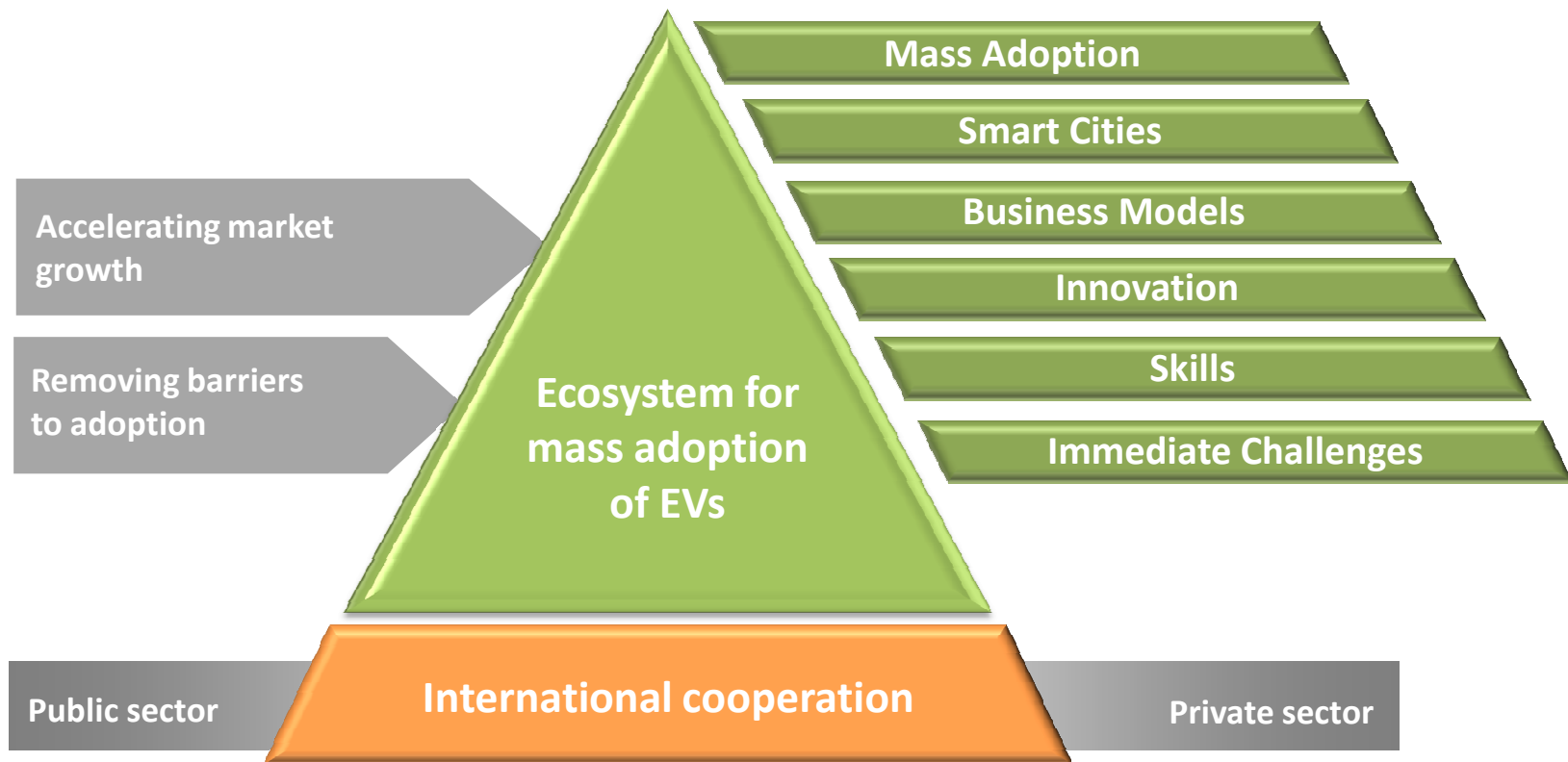


£10 million SWITCH EV demonstration



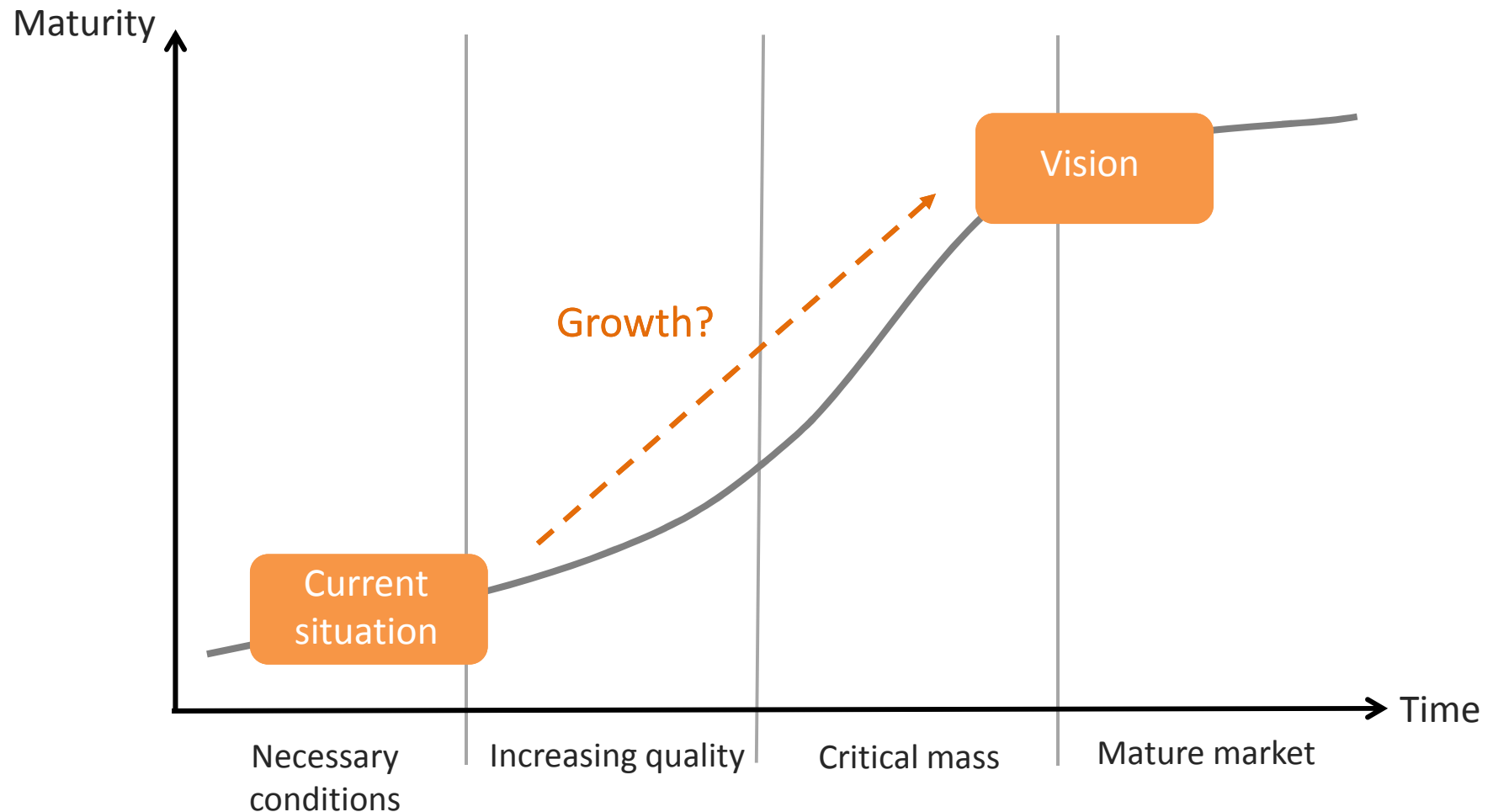
EV car club

Environments for mass adoption of EVs



What needs to be done?

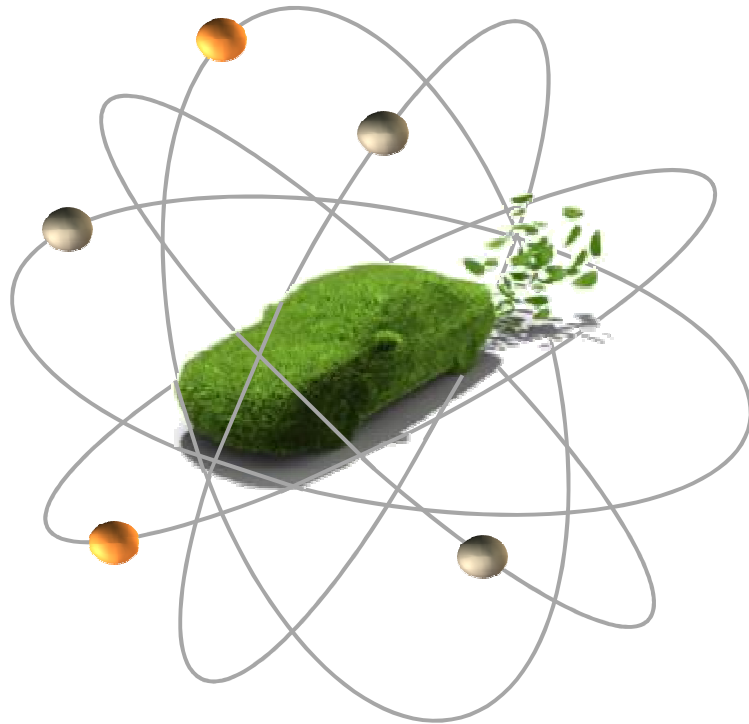
Creating conditions for mass adoption of electric vehicles



Electric vehicle ecosystems

Electric vehicle ecosystems

‘Total environments’ to support operation of thousands of vehicles



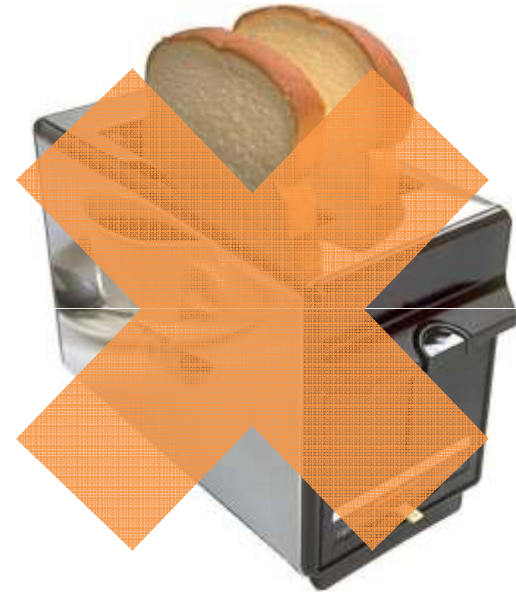
- **‘Hard Infrastructure’**

e.g. recharging points, smart grids,
buildings, transport systems

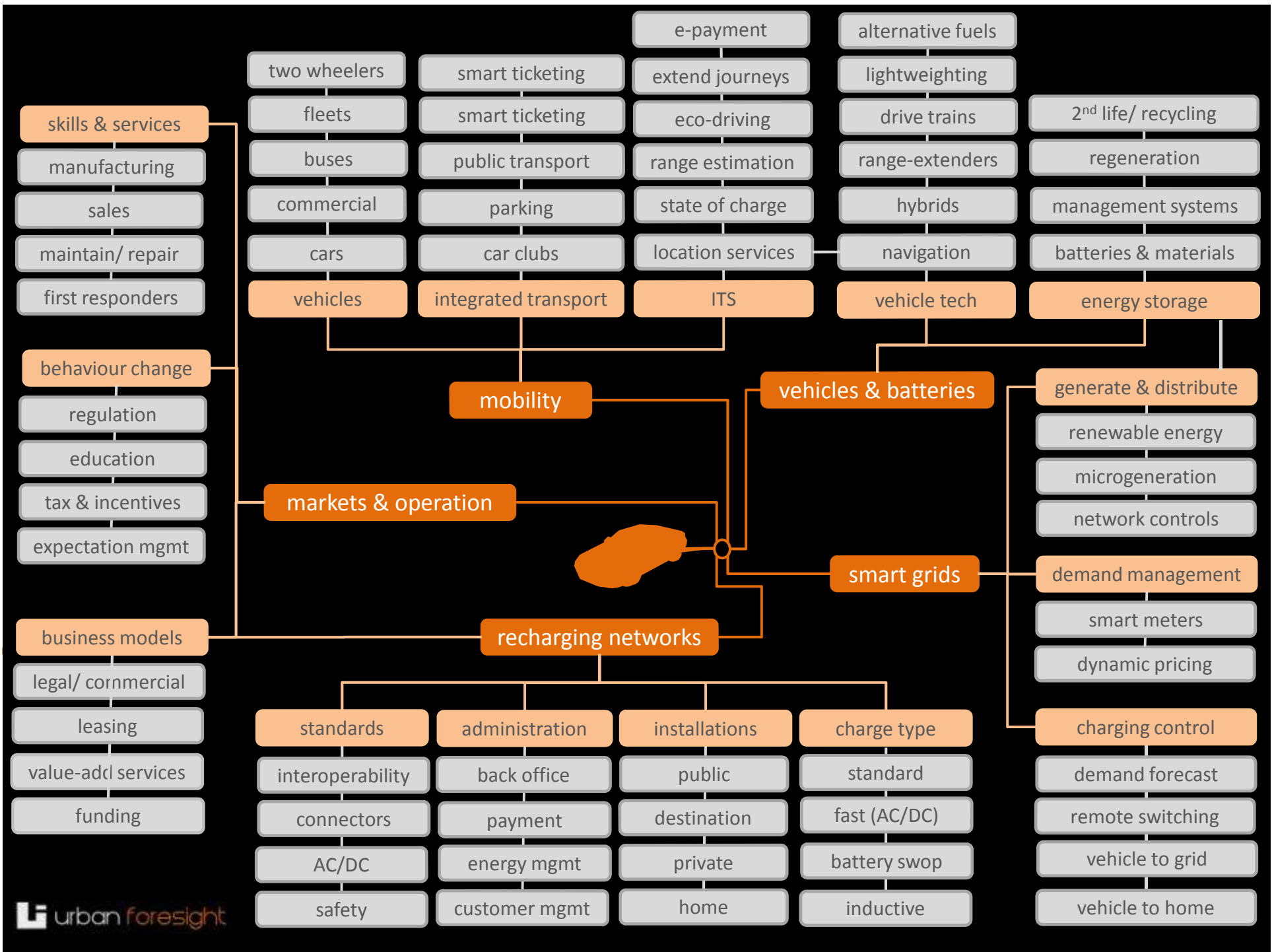
- **‘Soft Infrastructure’**

e.g. regulation, business models, incentives,
skills, community engagement

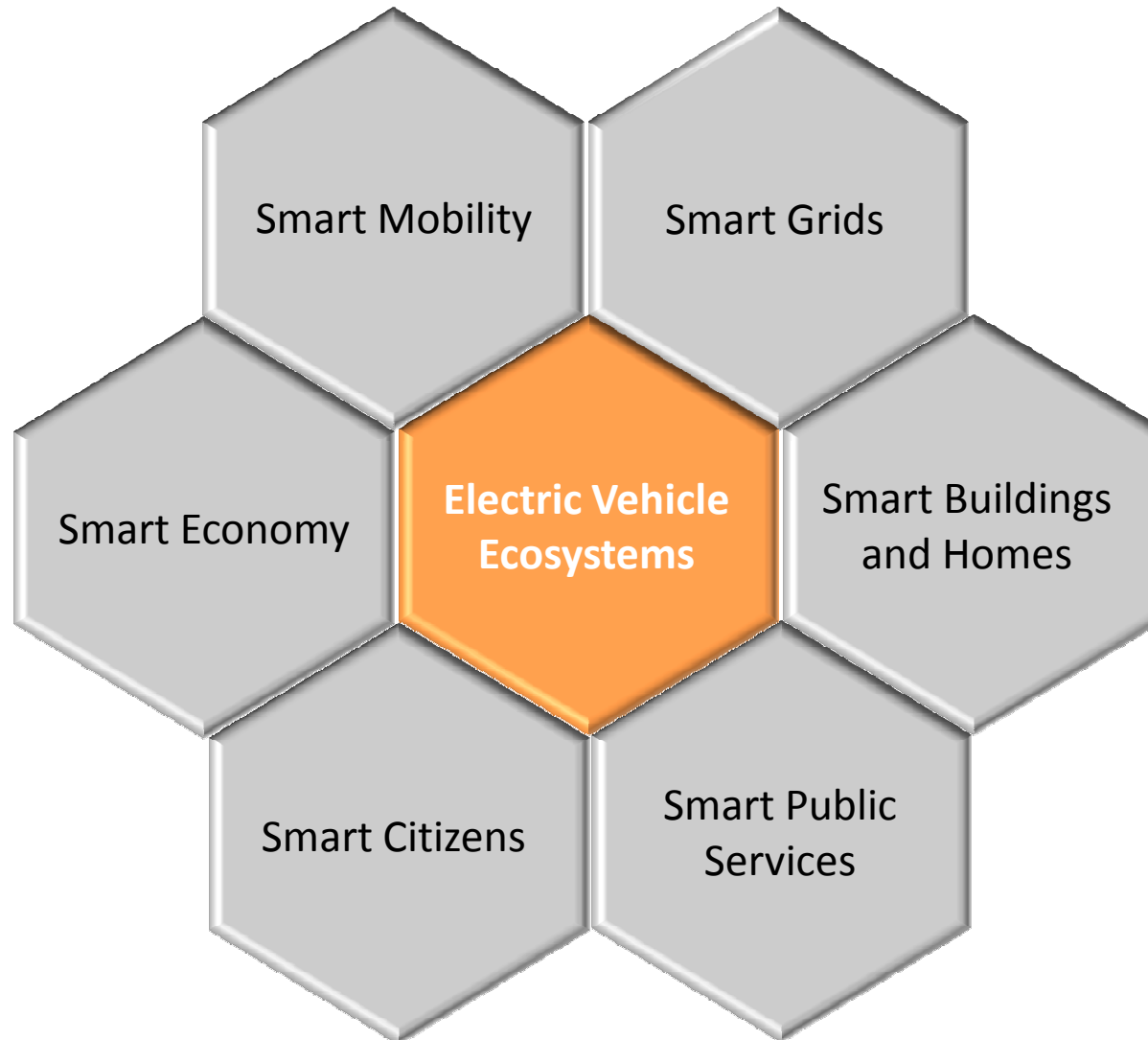
'Silo thinking' on electric vehicles



“The Tesla-Toaster Trap”



Integrated & holistic vision



IEA HEV Task 18: EV Ecosystems

Task 18 members:

Austria		
Germany		 
Portugal		 
Spain		 
UK		 
USA		 
International		 

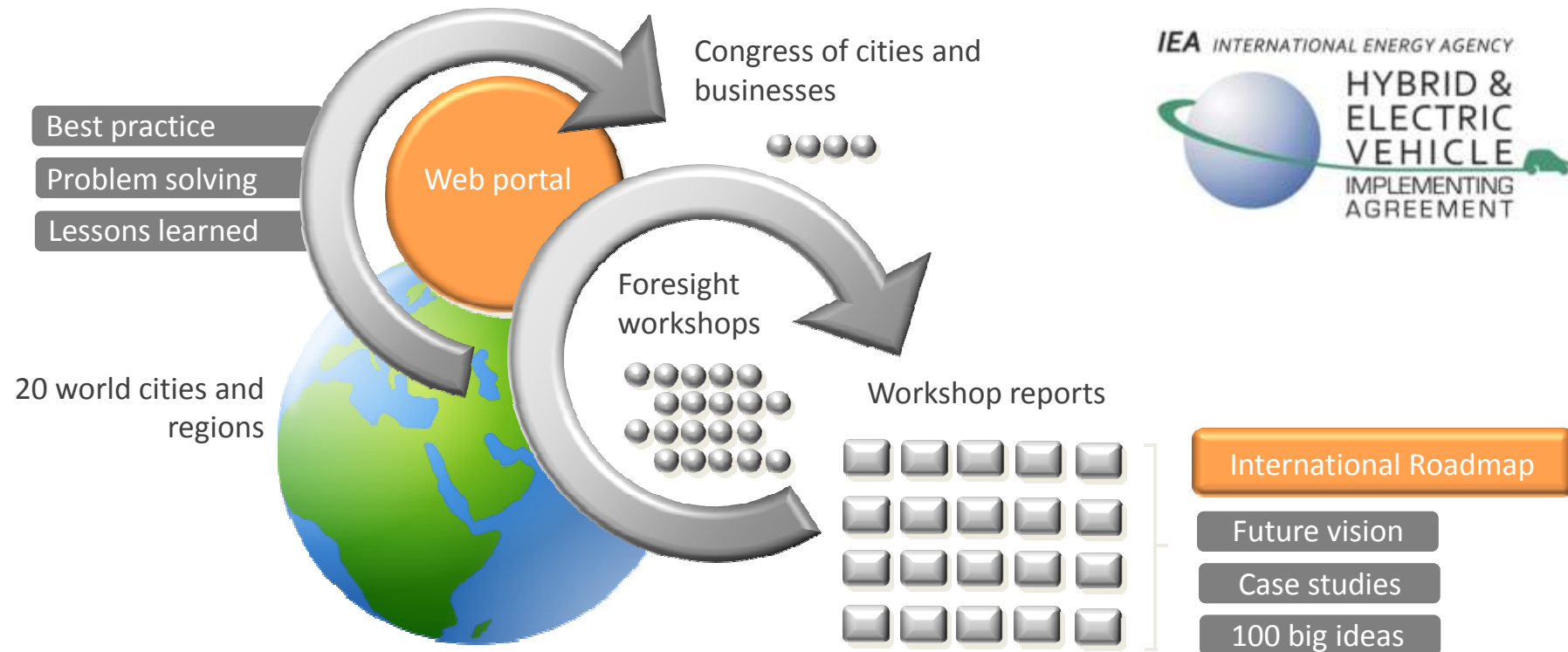
Collaborating with international EV-related initiatives:



ev ecosystems
IEA IA-HEV Task XVIII



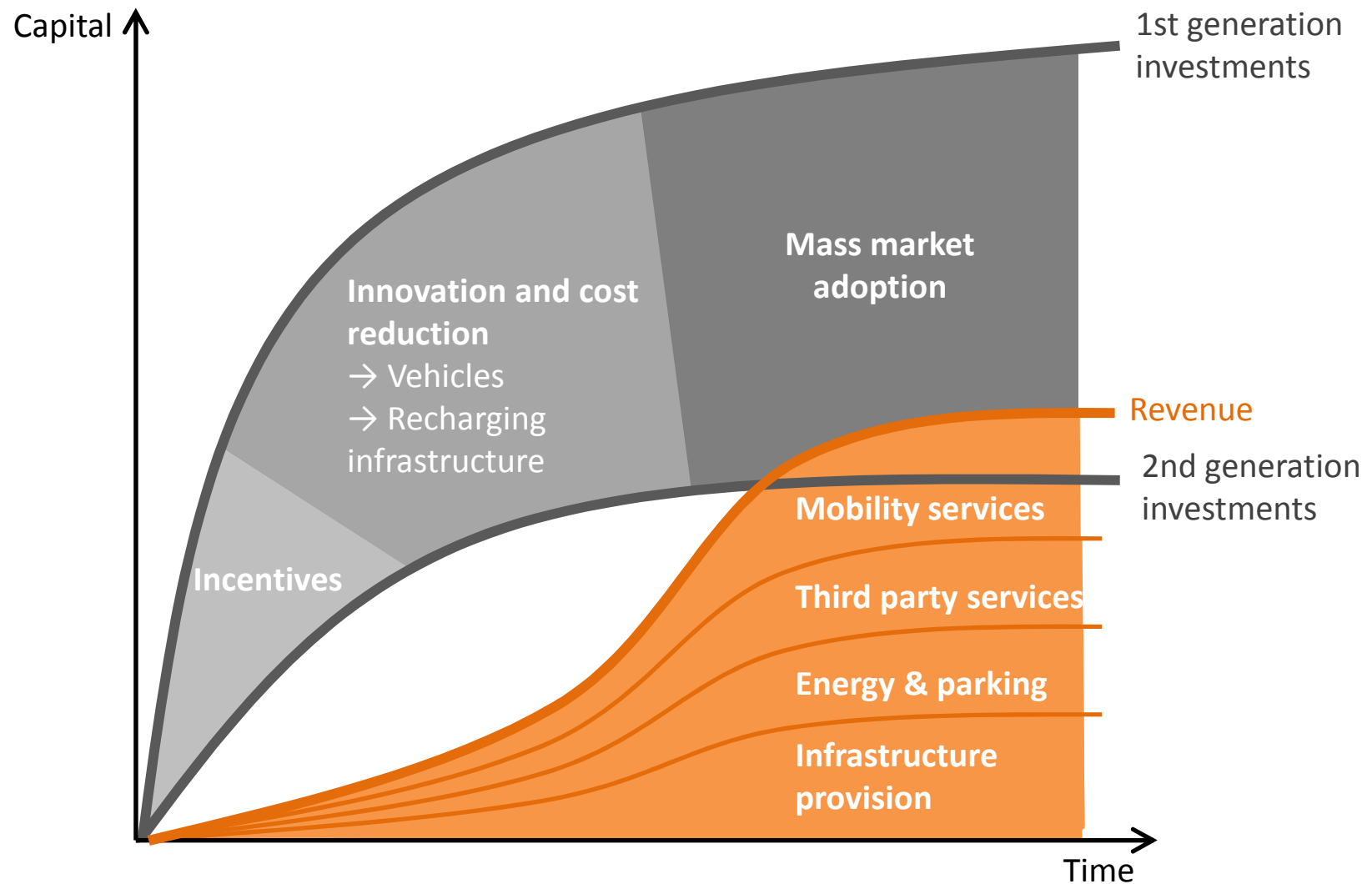
Shaping a global vision



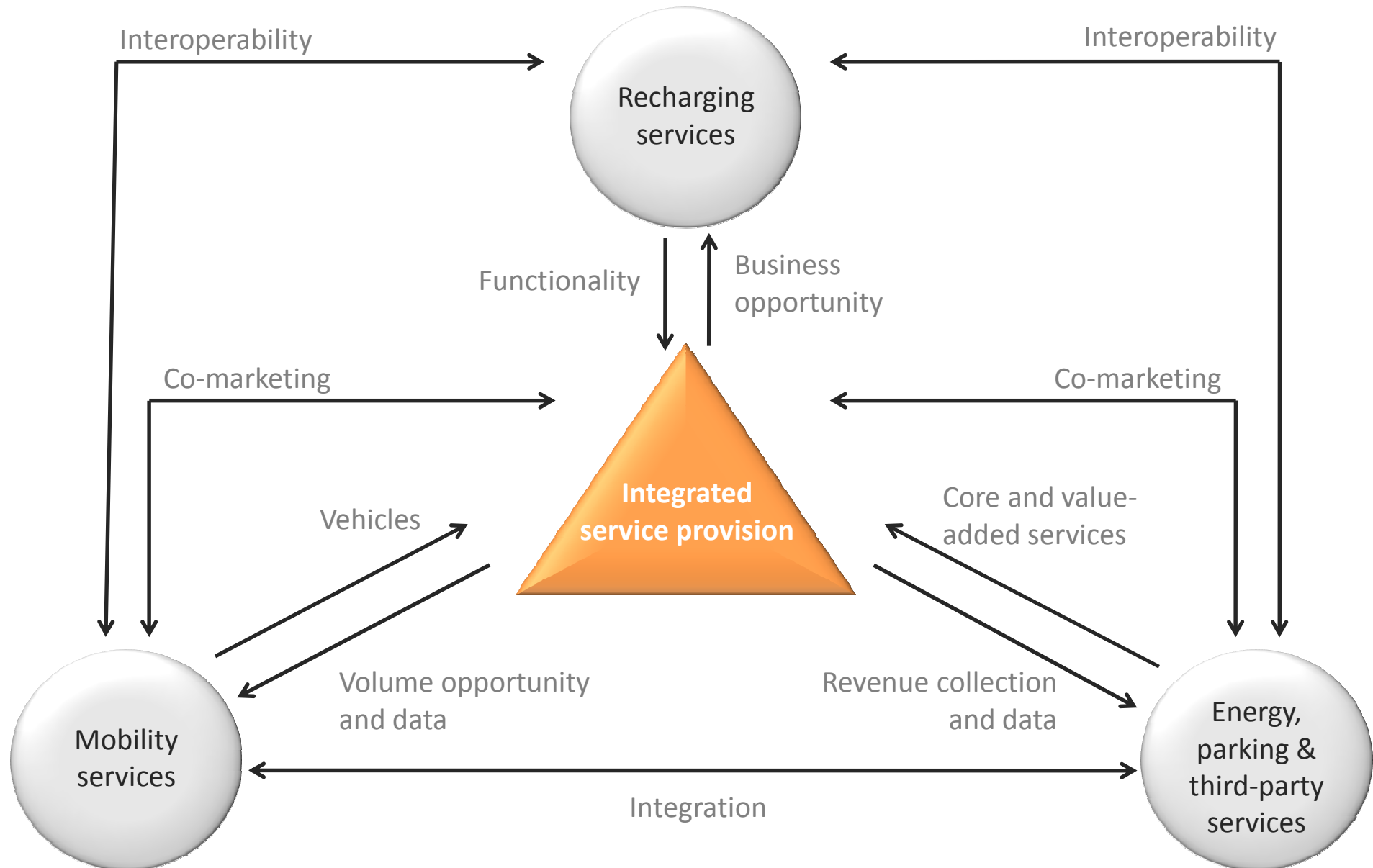
- **Foresight workshops** in up to 20 pioneering world cities, assembling experts from municipalities, regional authorities, governments, research and industry
- **International Roadmap:** lessons learned and a future vision for EV Ecosystems
- **A global web portal of pioneering cities:** database for policy exchange and problem solving

Challenges and opportunities

1. Future business models

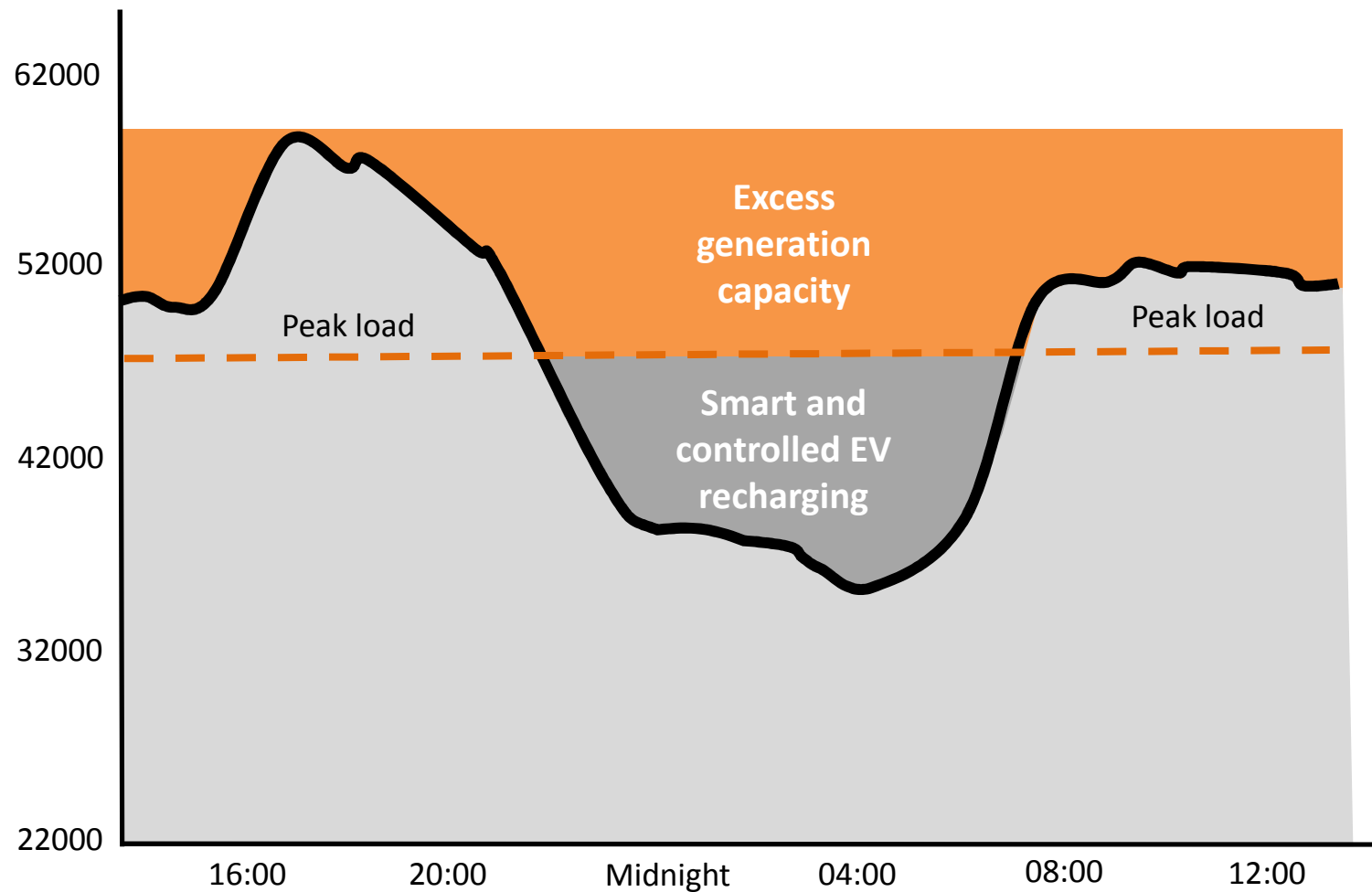


1. Future business models

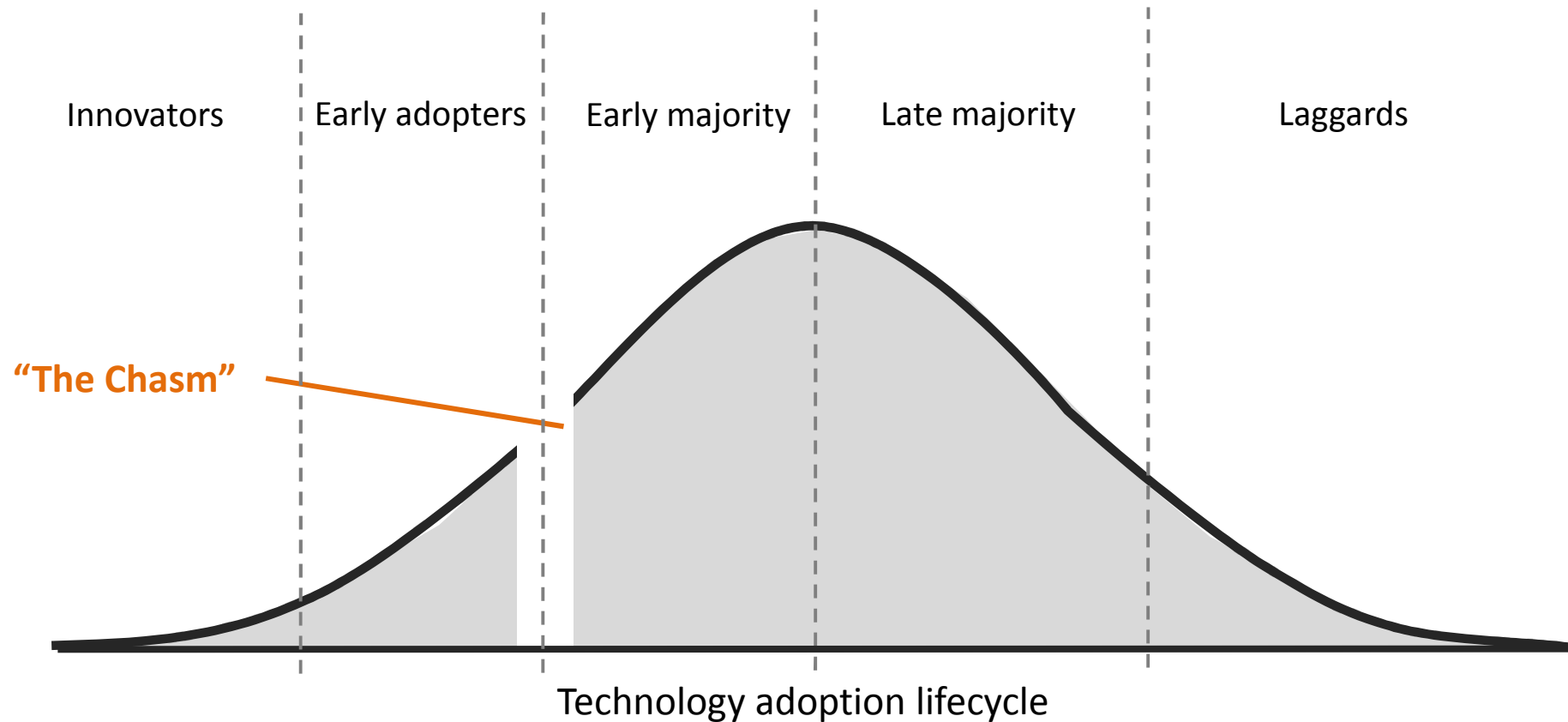


1. Future business models

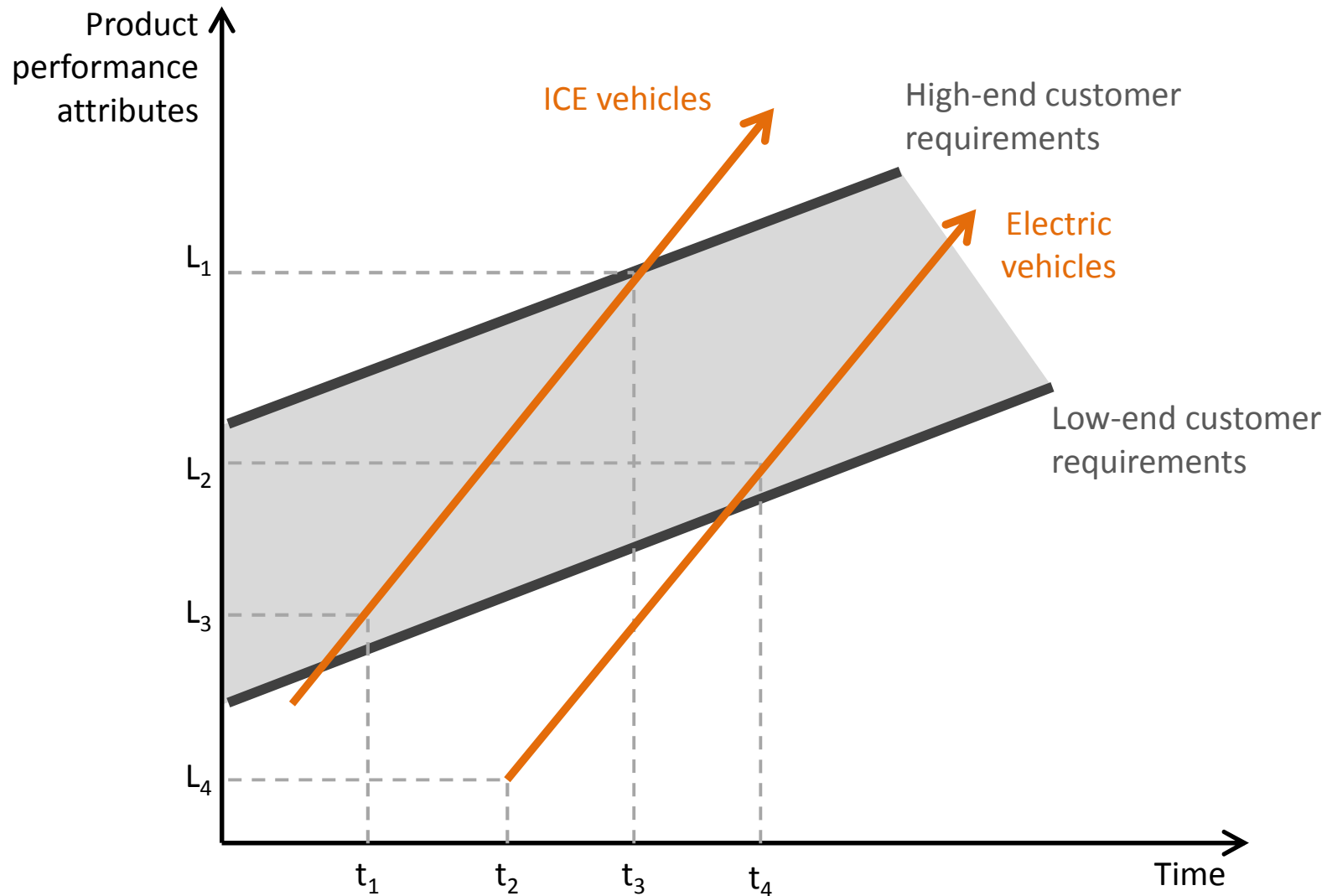
Total UK electricity demand (MW) in a 24-hour period to noon on a weekday in December '07



2. Market dynamics and social change

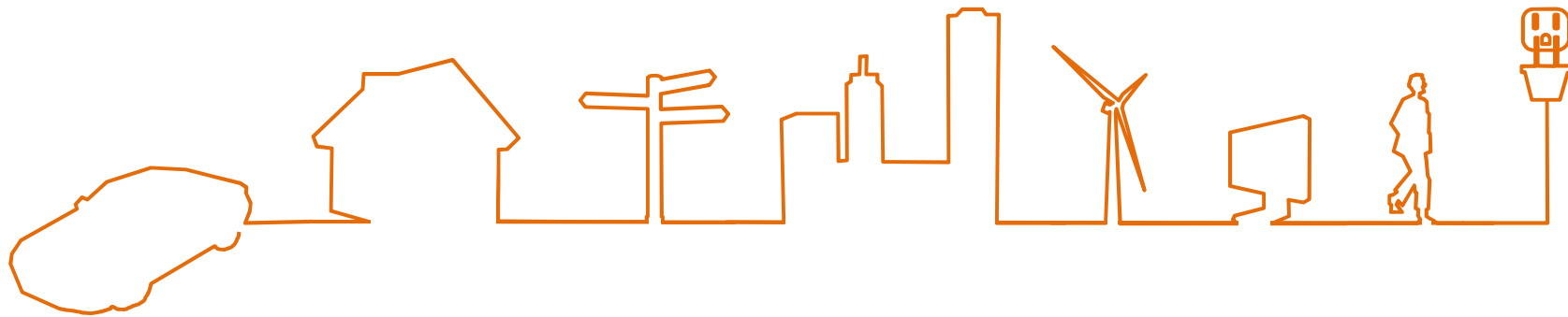


2. Market dynamics and social change



3. BIG question for smart cities

Unlocking opportunities beyond recharging batteries in cars



3. BIG question for smart cities

An ITS perspective...

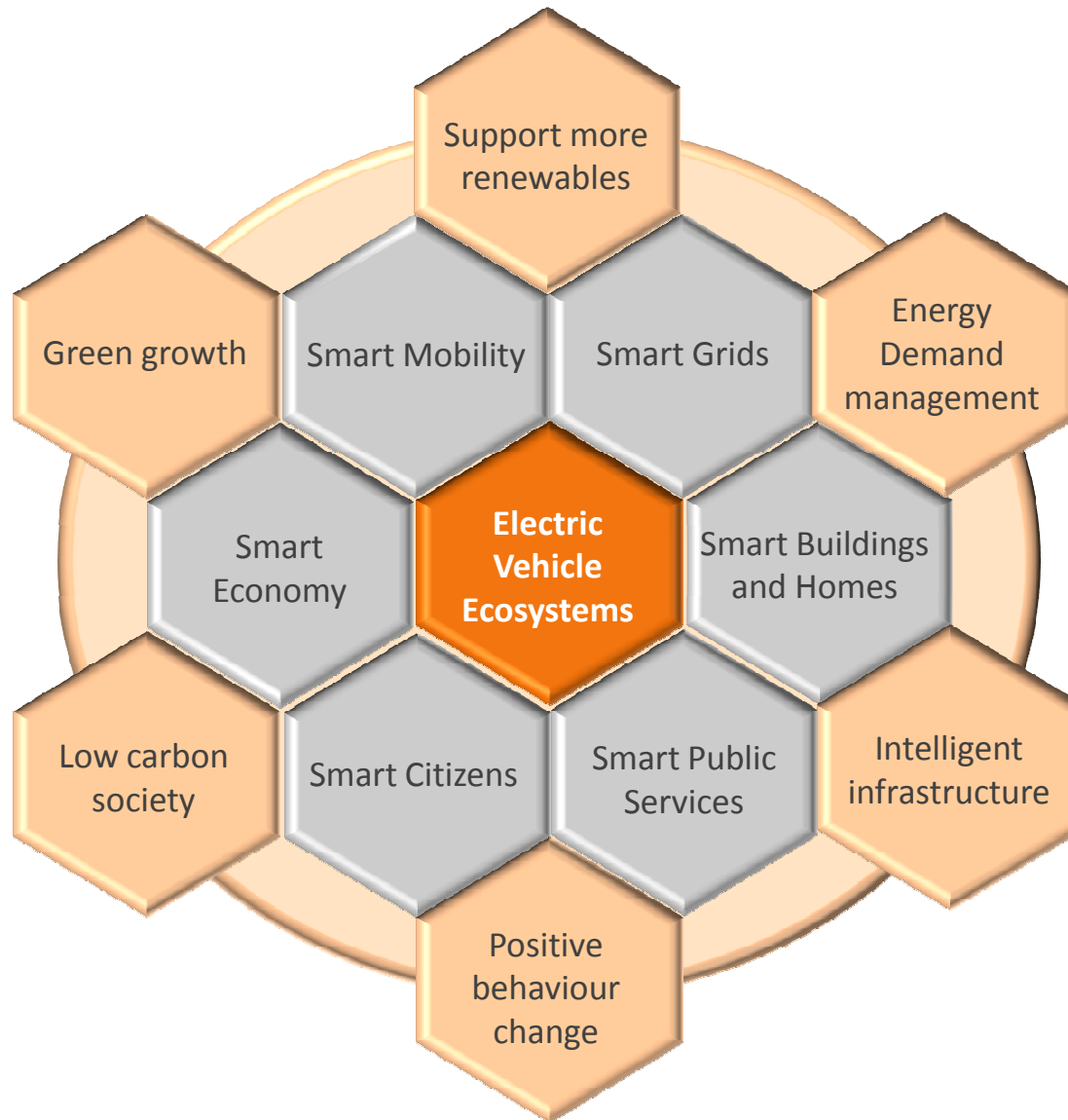


Is EV just another silo?

...or a potential source of unifying intelligence?

EVs Can Make Cities Smarter

EVs can make cities smarter



Reduce environmental impact

Sustainable economic growth

Improved living conditions

This is not ^{just} a car



thank you

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strategy and
solutions for
smart cities