

Future Transport Systems

The broad implications of EV charging infrastructure in the UK

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- Market growth projections
- Charging infrastructure distribution
- Charging technologies
- Compatibility issues
- Implications for existing systems and networks
- Observations

What we do

Electric vehicle infrastructure consultants

- Technical
 - Integrating hard and soft factors
 - Bridging the gap between on-board and off-board networks
 - Linking the O.E automotive and renewable/energy supply sectors
 - Using software and network modelling expertise to advise on charging infrastructure availability, suitability, layout and specification.
 - Data capture, reporting and analysis
- Commercial
 - Business & operating models,
 - Project creation
 - Funding/bid applications, LCV policy and analysis
- Social
 - Public engagement and implementation strategies
- Turnkey solutions
 - Managing the delivery of small and large scale pilot and demonstration projects
- Integration & transition



**Network capacity
modelling
and representation**



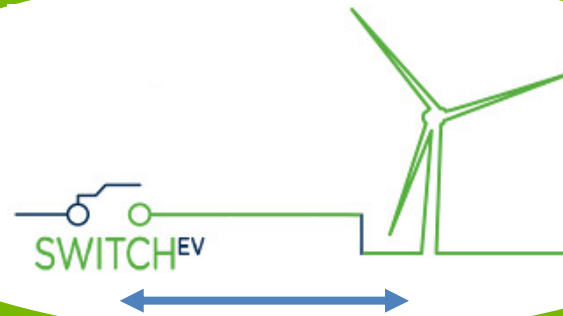
Transition & Integration

Enablers

- Niche to production
- Technology advancement
- Infrastructure investment
- Public acceptance
- Incentives

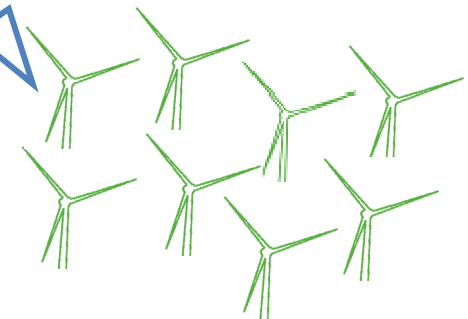
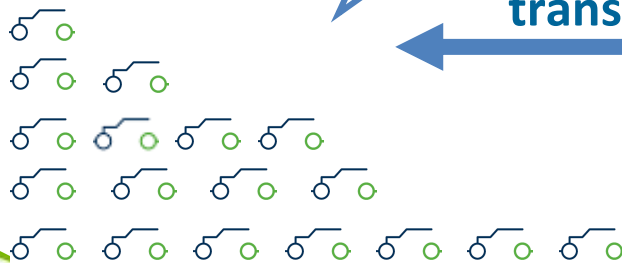
Drivers

- Environment
- Economics
- Energy security
- Standards



Pioneering
the integration

Managing the
transition to volume



Market growth projections

Frost & Sullivan Forecast - European EV Sales

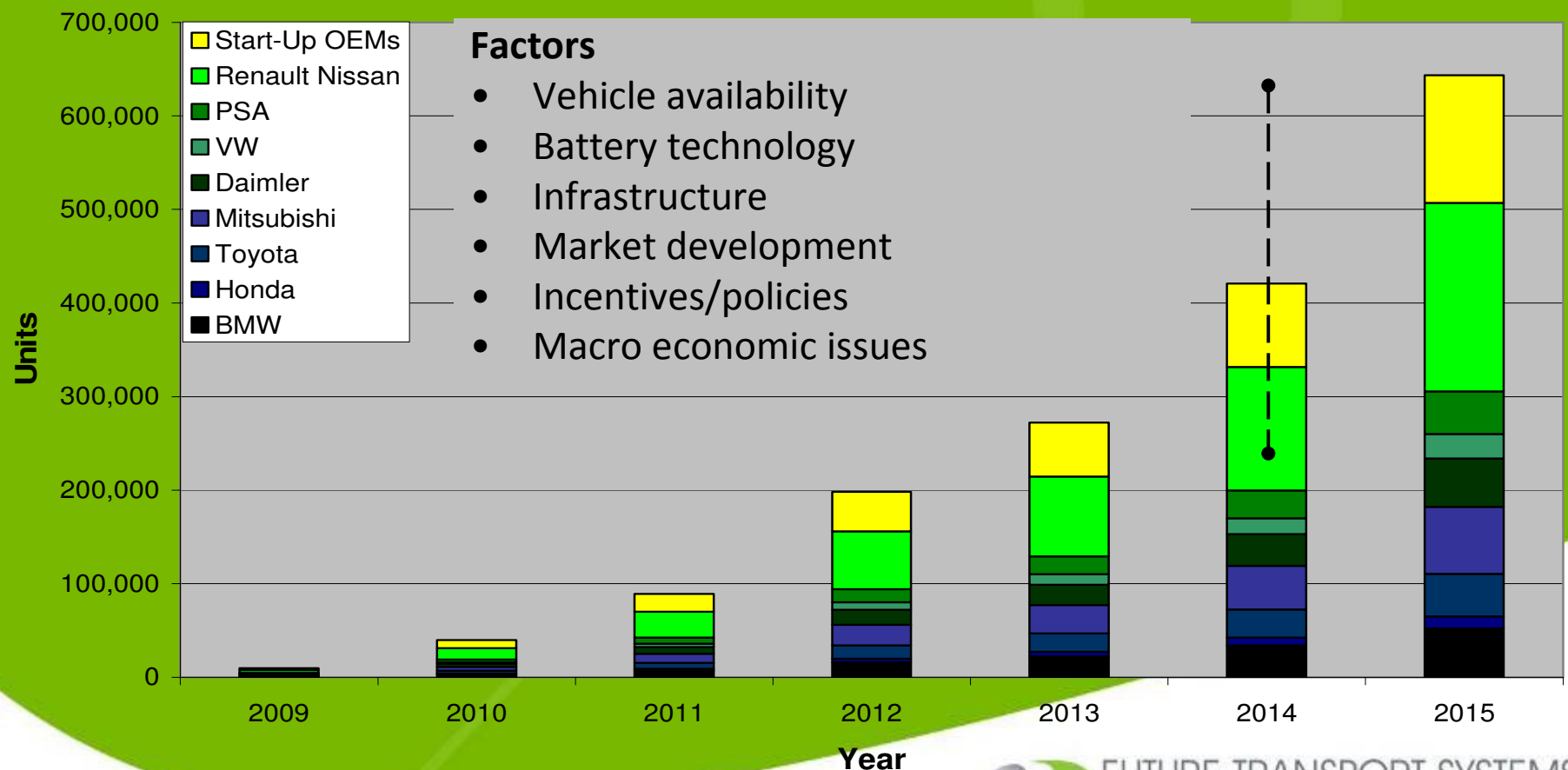
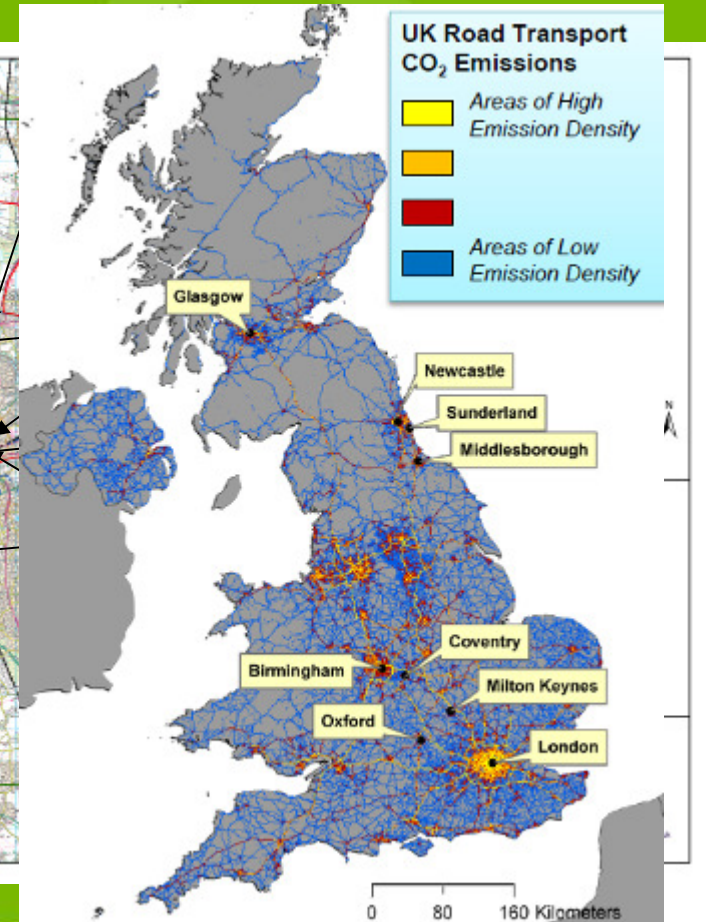
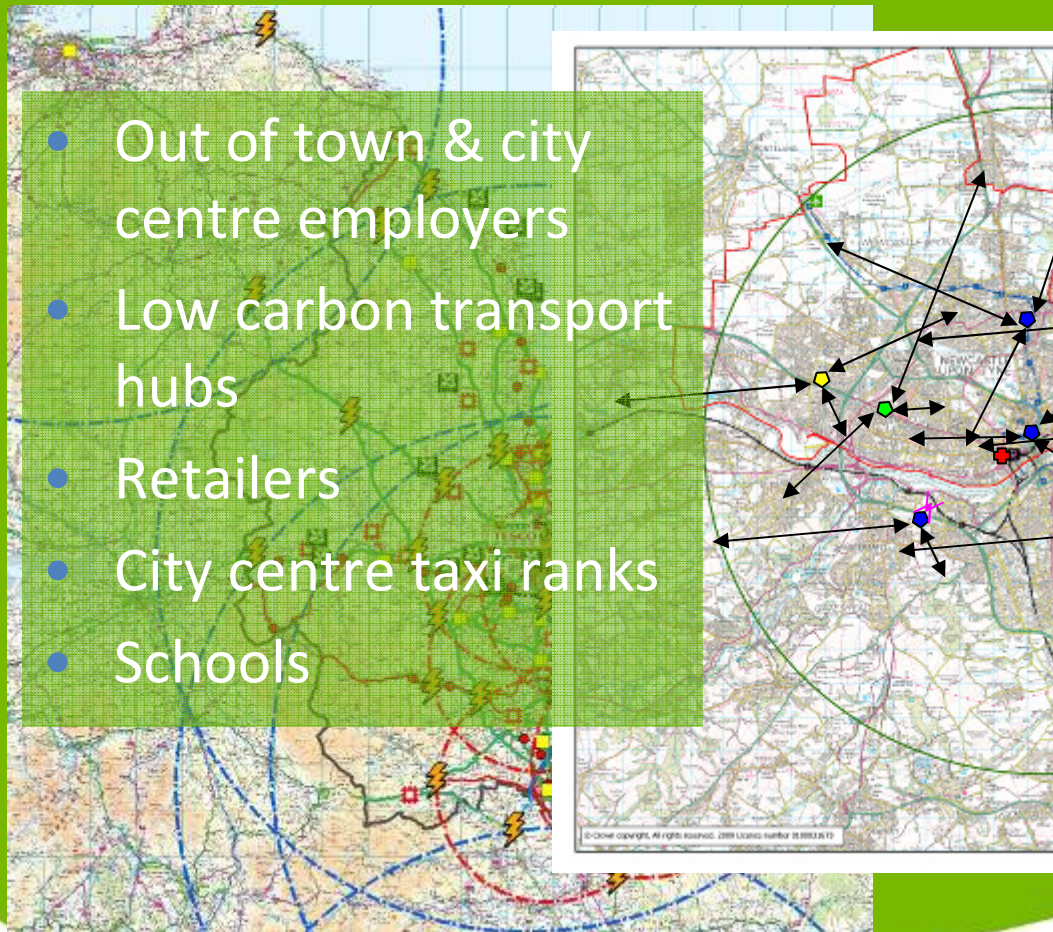


Figure - Projected Passenger EV Growth

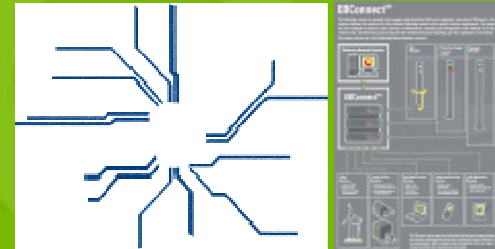
Market segmentation & spatial distribution

- Out of town & city centre employers
- Low carbon transport hubs
- Retailers
- City centre taxi ranks
- Schools



Charging technologies

- Single phase Trickle & Fast charging
 - On board charger
- 3 phase commercial charging
 - On board charger
- Rapid charging 50KW DC
 - Off board charger
- Induction chargers
- Renewables linked
- Storage linked



Compatibility issues

- Plugs
- Vehicles & charging points
 - Currents & Voltages - communications
- Access systems
- Billing systems
- Additional functionality
-existing traffic systems etc.

Implications for electrical networks

- Demand patterns
- Total demand
- Peak loads
- Harmonics
- Infrastructure reinforcement
- Network management
- Electricity costs
- Suppliers

Observations

- A multitude of issues
- An integrated approach is critical
- Contained/controlled large scale pilots are probably critical to success

Thank you

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