

Clean energy and smart grids for electric vehicles

David Talbot, European Research Coordinator
Tina Pancha, City Planner

<https://tfl.gov.uk>

Introduction

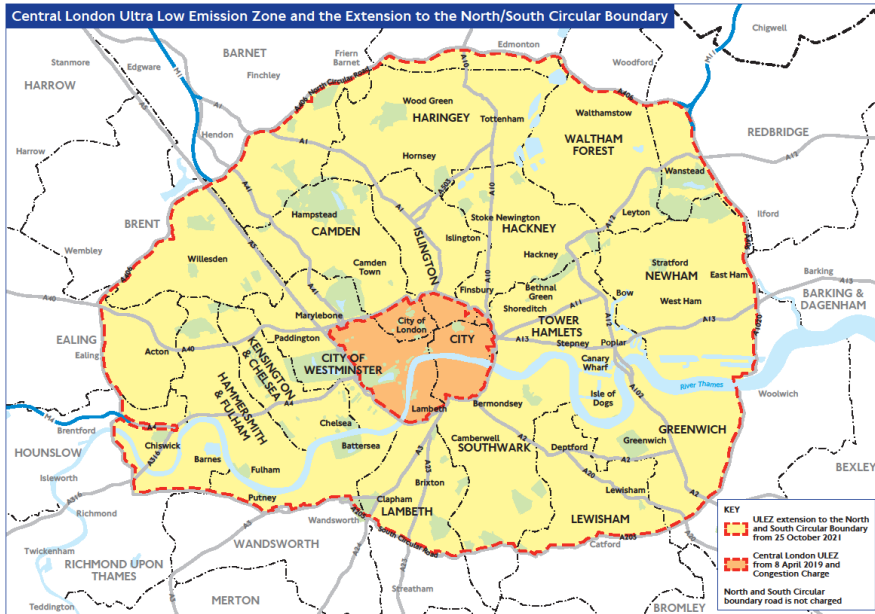
- City Policy
 - ReVeAL
- Scale of the challenge
 - Buses, taxis, freight, cars
- Research Projects
 - Eiptic
 - CleanMobilEnergy
 - E-Flex
 - WiCET
 - GreenSKIES



City Policy

- Emissions control
- Fleets TfL control
- ULEZ Impacts

https://www.london.gov.uk/sites/default/files/ulez_six_month_evaluation_report_final_oct.pdf



Zero Emission Capable (ZEC) licencing requirements from 2018 (Black Cab) and 2020 (PHV), achieving a fully ZEC fleet by 2033



All single deck buses will be zero emission in the ULEZ in 2020; the whole fleet will be fully zero emission by 2037

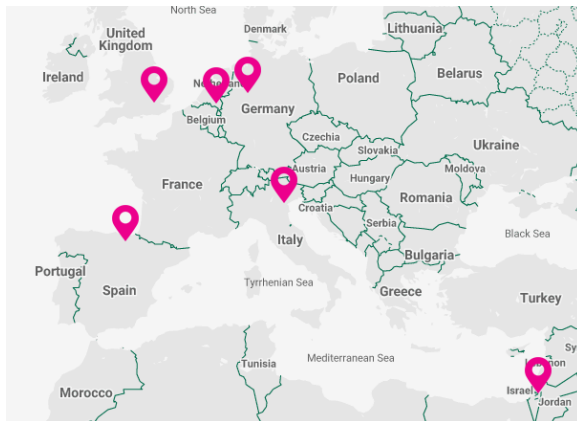


ReVeAL



<https://civitas-reveal.eu>

- ZEC Enforcement Database
- Geofencing
- Signage and Logos
- Knowledge sharing and scale up

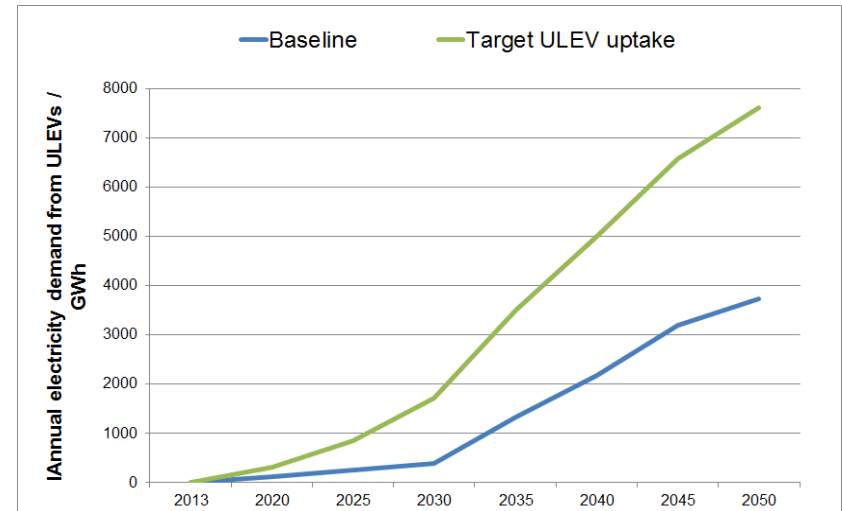


- Bielefeld
- Helmond
- London
- Padua
- Jerusalem
- Vittoria Garcia



The Challenge of Electrifying Road Transport

- Moving to a zero emission vehicle fleet has implications for London's energy supply
- At higher levels of ULEV uptake, demand of 7-8 TWh p.a. is possible



Mode of transport	Estimated ENERGY consumption p.a.	Max POWER consumption
London Underground	1.1 TWh	~ 250 MW
London Buses	750 GWh – 1 TWh	~ 250 MW
Taxis	~2 TWh	~ 500 MW
Other road transport	-3-4 TWh	~ 1GW



Eliptic

- Use of TfL grid for EV charging
- Complex interplay of supply and demand
- High reliability and redundancy but dirty power
- Very tightly constrained operating rules

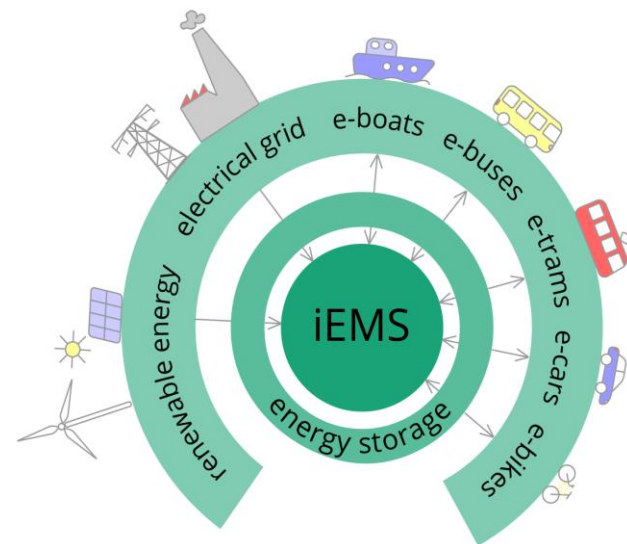


<https://www.eliptic-project.eu>



CleanMobilEnergy

- Integrate small scale renewable energy production into the transport energy mix.
- Reduce GHG emissions by coordinating:
 - Renewable energy sources (RES)
 - Energy storage
 - EV charging
- Develop an interoperable energy management system (iEMS) to merge the gap between RES supply & energy demand



<https://www.nweurope.eu/projects/project-search/cleanmobileenergy-clean-mobility-and-energy-for-cities>



E-Flex

- **Large scale demonstration of V2G**
- **Commercial fleets**
- **Connected to the TfL grid**
- **Create market mechanisms**
- **Building the fleet operations business cases**

<https://www.e-flex.co.uk>

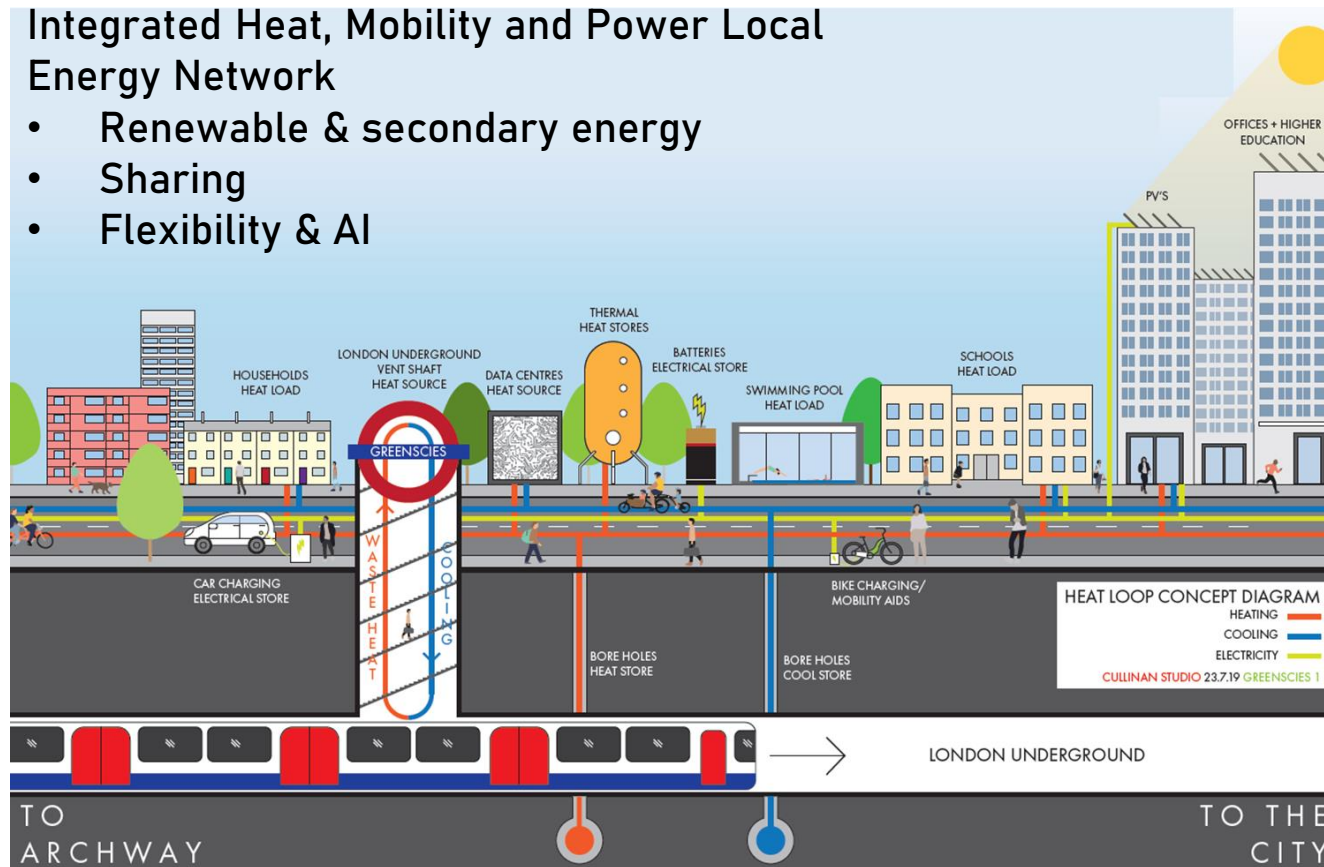


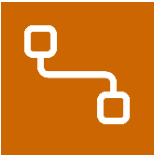
GreenSCIES



Integrated Heat, Mobility and Power Local Energy Network

- Renewable & secondary energy
- Sharing
- Flexibility & AI





Links new and existing energy networks



Serves >44,000 residents



Connects to >78 businesses



Results >£8 million revenue savings



Addresses fuel poverty >6,600 residents



Saves >32,000 tonnes of CO2e p.a.

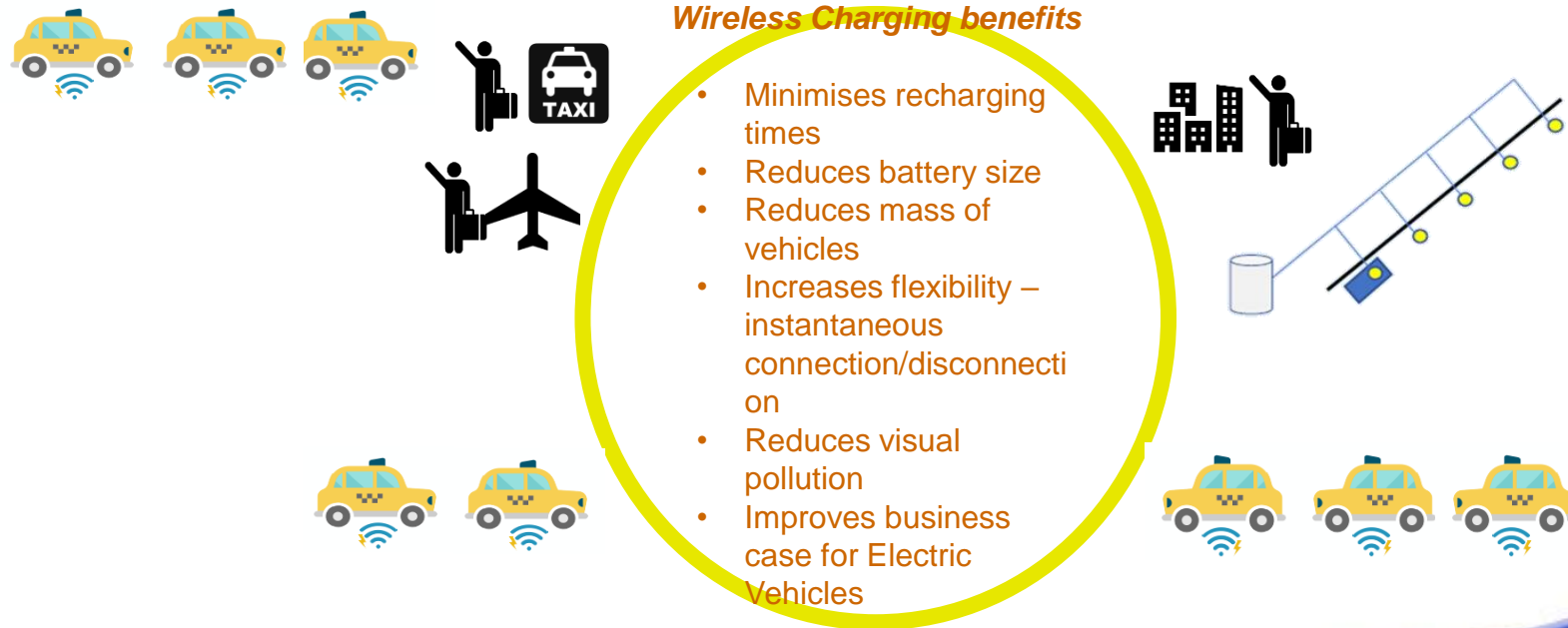


Improves air quality by at least 18%



WiCET

- Inductive charging feasibility study.
- In London focused on Black Cabs
- Technical, legal, operational, regulatory, human factors and safety aspects



davidtalbot@tfl.gov.uk
tinapancha@tfl.gov.uk
www.tfl.gov.uk

