#LCV2019 @LCV_Event

A Summary of "Energy for Transport" work in the ISCF3 Prospering from the Energy Revolution Projects

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GEOTAB
management by measurement

CENEX LCV19 – Energy for Transport aspects of the ISCF PFER projects

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INDUSTRIAL STRATEGY | UK Research and Innovation

Wednesday 4th September 2019

@EnergySysCat LinkedIn

INDUSTRIAL STRATEGY

CATAPULT Energy Systems

Grand Challenges	
AI and data economy	Clean Growth
Ageing society	
Future of mobility	

Challenges			
Audience of the future Faraday battery challenge From data to early diagnosis and precision medicine Healthy ageing Leading-edge healthcare Next-generation services Quantum technologies Robots for a safer world Transforming construction Transforming food production Creative industries clusters Driverless cars Manufacturing and future materials National Satellite Test Facility	Prospering from the Energy Revolution		
	Innovation Accelerator Fund	Test and Demonstration Facilities	Smart Local Energy Systems

Concepts | Designs | Demonstrations

Integration, expertise and research

ERRC | ERIS

11 Concept Design projects (6 months)

4 Demonstrator projects (3 yrs: Apr 19 – Mar 22)

10 Detailed Designs projects (2 yrs)

7 Key Components projects (2yr FS/IR) ***Open until 9th Oct***

ERIS | THE ENERGY REVOLUTION INTEGRATION SERVICE

Part of the Prospering from the Energy Revolution Challenge Programme

ERIS INCREASES THE IMPACT OF A MAJOR NATIONAL PROGRAMME

£102m FUNDING
SUPPORTING DECARBONISATION TO ACHIEVE NET ZERO BY 2050

11 CONCEPT DESIGNS
CREATING INNOVATIVE SMART LOCAL ENERGY SYSTEM CONCEPTS

10 DETAILED DESIGNS
TURNING CONCEPT SYSTEMS INTO INVESTMENT-READY BUSINESSES

4 DEMONSTRATORS
PROVING BUSINESS MODEL VIABILITY WITH REAL CUSTOMERS

ERIS EXISTS TO

HARNESS THE 'PROSPERING FROM THE ENERGY REVOLUTION' PROGRAMME AND ENHANCE THE BUSINESS CASE FOR SMART LOCAL ENERGY SYSTEMS AS A PATHWAY TO DECARBONISATION, BY HELPING KEY STAKEHOLDERS OVERCOME BARRIERS

INVESTIGATING AND EVALUATING SMART LOCAL ENERGY SYSTEM VIABILITY TO REDUCE RISKS TO DEVELOPMENT AND INVESTMENT

GENERATING INSIGHTS THAT INCREASE THE IMPACT OF THE PROGRAMME BY INFORMING LOCAL AND NATIONAL DECISION AND POLICY MAKING

IDENTIFYING AND OVERCOMING BARRIERS TO SMART LOCAL ENERGY SYSTEM DEPLOYMENT BY ENABLING COLLABORATION AND DELIVERING WHOLE ENERGY SYSTEM EXPERTISE

ERIS IS BUILDING A COMMUNITY TO COMBINE FORCES AROUND OPPORTUNITIES, CHALLENGES AND SYNERGIES

THROUGHOUT THE PROGRAMME ERIS WILL SYNTHESISE LESSONS AND INSIGHTS THAT SUPPORT DECARBONISATION OF THE ENERGY SECTOR

- ENERGY SYSTEM DEVELOPERS
- INVESTORS
- LOCAL AUTHORITIES
- GOVERNMENT
- REGULATORS
- ACADEMICS

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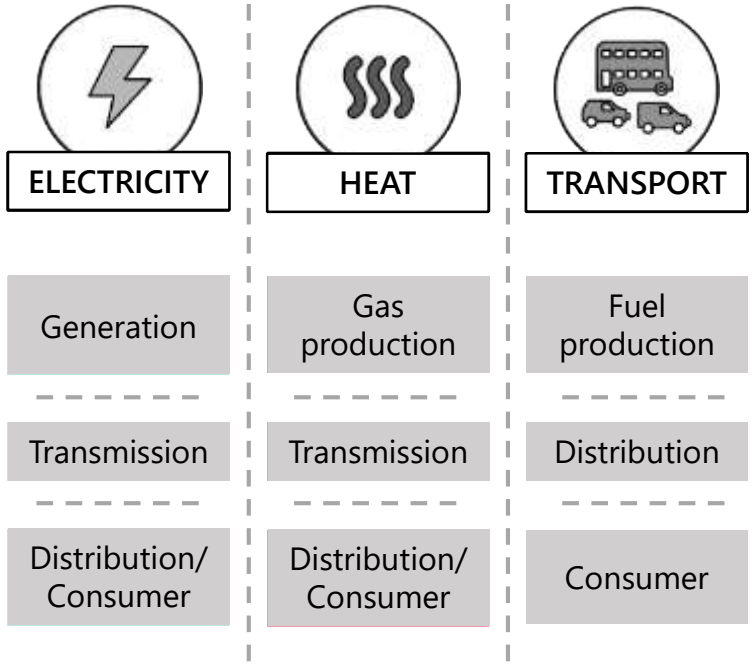
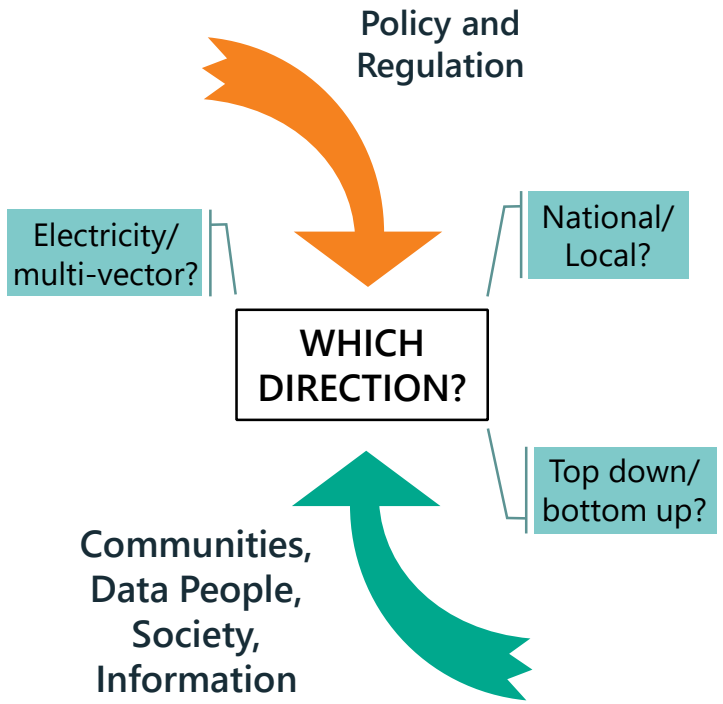
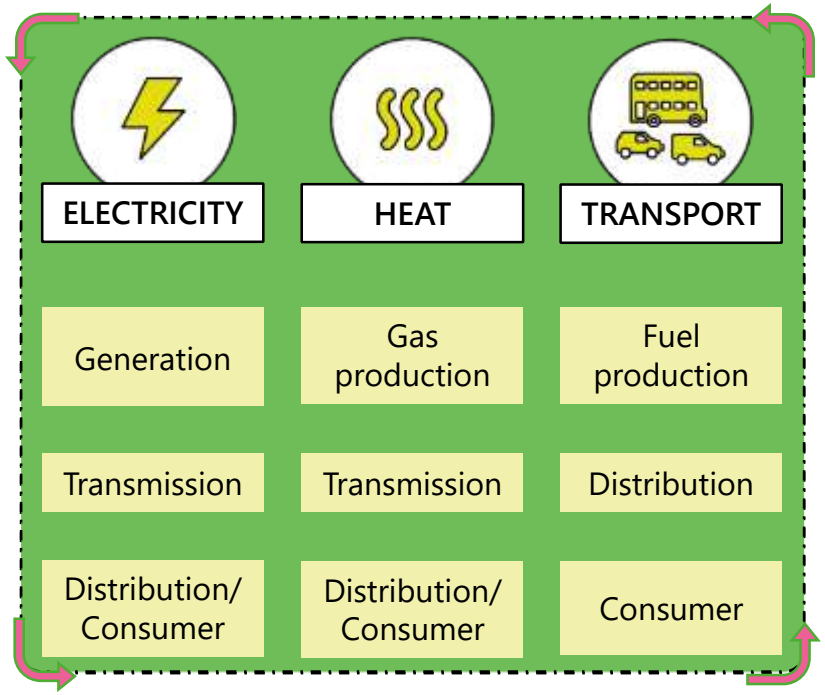
CATAPULT Energy Systems

The energy system is transforming







Decentralisation **Decarbonisation** **Democratisation** **Digitalisation**

The PFER projects: 11 Concepts, 4 Demonstrators

Concept Designs

- Local Energy Market in **Devon and Exeter**
- **Bristol** Energy Smart System Transformation
- BankEnergi - **London Southbank**
- Green Smart Community Integrated Energy Systems – **London Islington**
- Intelligent **Bridgend** Energy System Designs
- An Energy Revolution for the Market Town of **Caldicot**
- Development of a Distributed Ledger Technology Micro-Grid Management Platform – **Corby**
- Energy Autonomous Community - **Isle of Wight**
- **Greater Manchester** Local Energy Market
- E-Port Energy - **Ellesmere Port**
- Whole Energy System: Levenmouth Integrated Demonstration – **Fife**

Demonstrators

- ReFlex - Orkney
- Energy Superhub **Oxford**
- Local Energy **Oxfordshire**
- Smart Hub SLES **West Sussex**

http://bit.ly/PFER_Concepts

Transport in the PFER projects

Projects have been exploring a range of impacts:

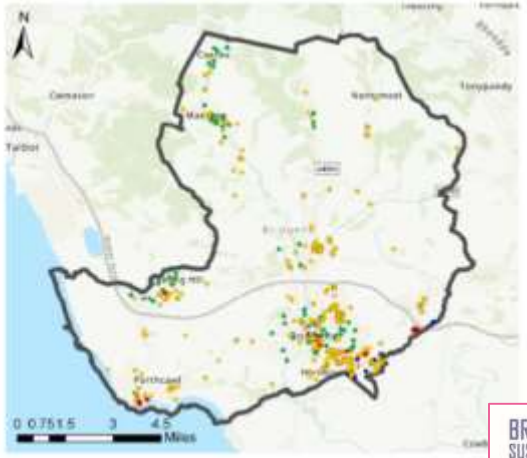
- Likely EV adoption over their local area
- Impact of Private passenger cars, vans, buses and council fleets (all vehicle types)
- Use of alternative fuels, e.g. H2
- Modelling of EV charger impact
- Integration of all those assets into the Local Energy System / Market

Case studies

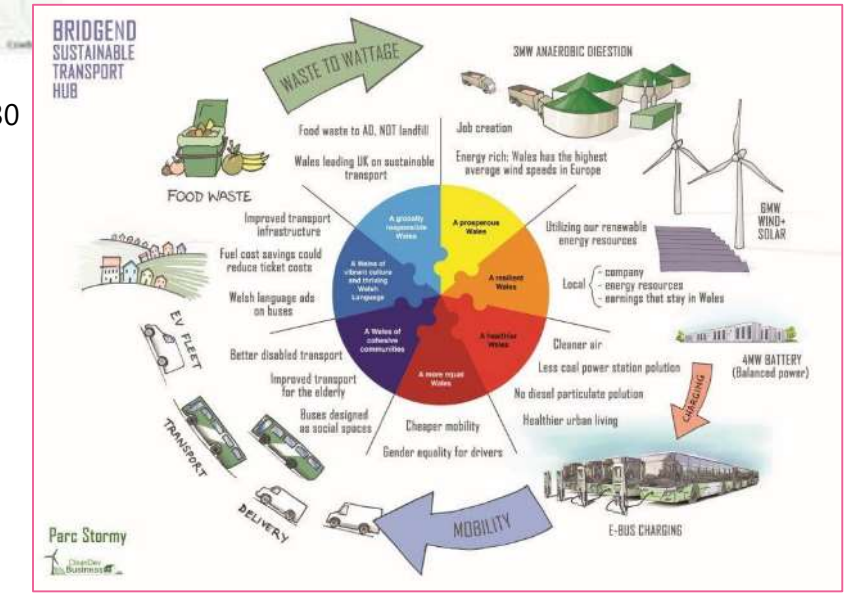
- GreenSCIES – London Islington
- Intelligent Bridgend Energy System Design

Case Study: Intelligent Bridgend Energy System Design

- Bridgend County Borough Council
  - Duty to all residents & businesses
  - Tackling fuel (and transport) poverty
  - Modelling of future scenarios
- Parc Stormy
  - Multiple energy vectors on one site
  - Business models for each transport type
- First Cymru
  - Depot relocation, e-buses for existing routes (20%), opportunity charging
  - Redesign routes and rethink asset use (TaaS, Demand Responsive Service)



Modelled on-street public and work place charge points by 2030



Findings

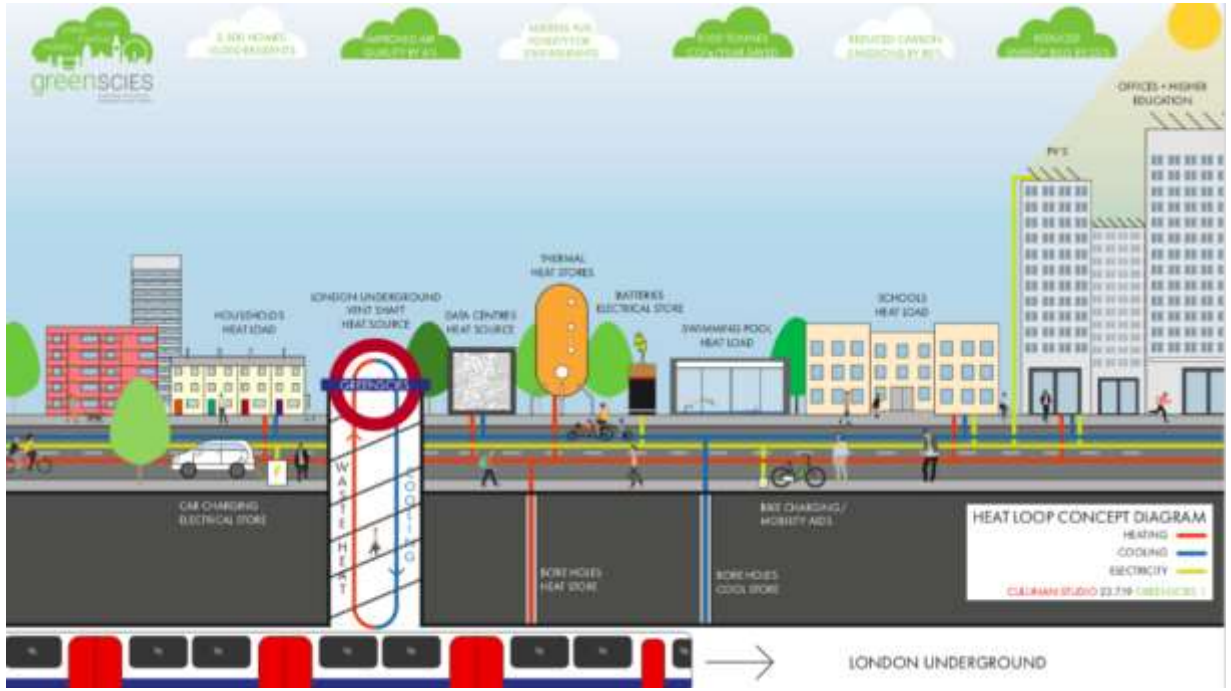
- Full EV conversion prohibitively expensive
- Different energy uses and rethinking vehicle use could achieve optimal CO2 reduction/Air Quality improvement/£/service

Case Study: GreenSCIES – London Islington

- Comprehensive study of Islington assets, opportunities, business models and stakeholder engagement
- Use of waste London Underground heat for local area heat network
- **Use of commuter and residents' EVs for different grid-support roles**
- Local battery storage

Findings:

- Estimated >80% total carbon savings across the project
- 25% reduction in user bills
- Virtuous circle of increased efficiency – reduced CO2 – improved AQ – reduced costs



Learning from the PFER Concept Projects

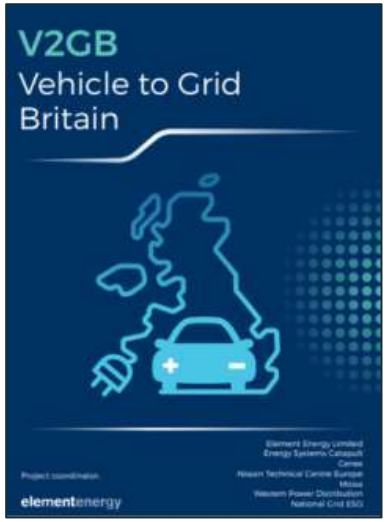
- Council, PSVs, and CVs all have very **predictable charge requirements**
- **Fast charging is not always the best solution** – 3/7kW more appropriate for some sites, e.g. railway stations where vehicles are left all day.
- **Many low-power charge points better than a few high-power**
- Some **negative impacts of installing charger infrastructure**, (parking displacement)
- Suitability of localised high-power energy storage – battery, H2, private wire to assets – for fast chargers
- **Vehicle chargers have to be planned for impact on local grid**

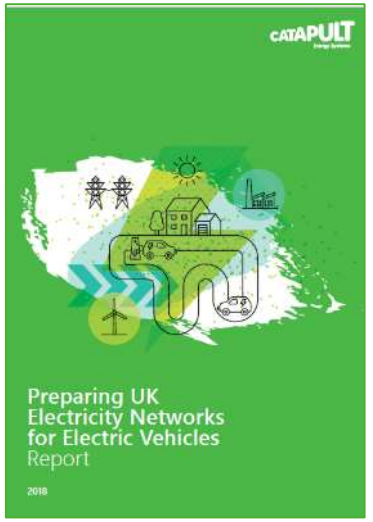
New business models explored within local areas:

- e-car clubs / shared use / e-taxi fleets
- Embracing different user groups in an area, e.g. residents as well as commuters and tourists
- Integration of smart charging and V2G into the Local Energy System business models

Other Catapult work in this area

- **Phil New, ESC CEO**, chairs the EV Energy Taskforce: http://bit.ly/ESC_EVET
- **Thalia Skoufa, Transport Practice Manager**, moderating the session "Progress with V2G technology", 09:30am tomorrow
- Preparing UK networks for EVs (with EA Technology and National Grid) http://bit.ly/Nets4EVs
- V2GB (with NTCE, Element Energy, CENEX, WPD, NG ESO, and others) http://bit.ly/ESC_V2GB
- Catapult assets relevant to transport include ESME, LEAR, EPN





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