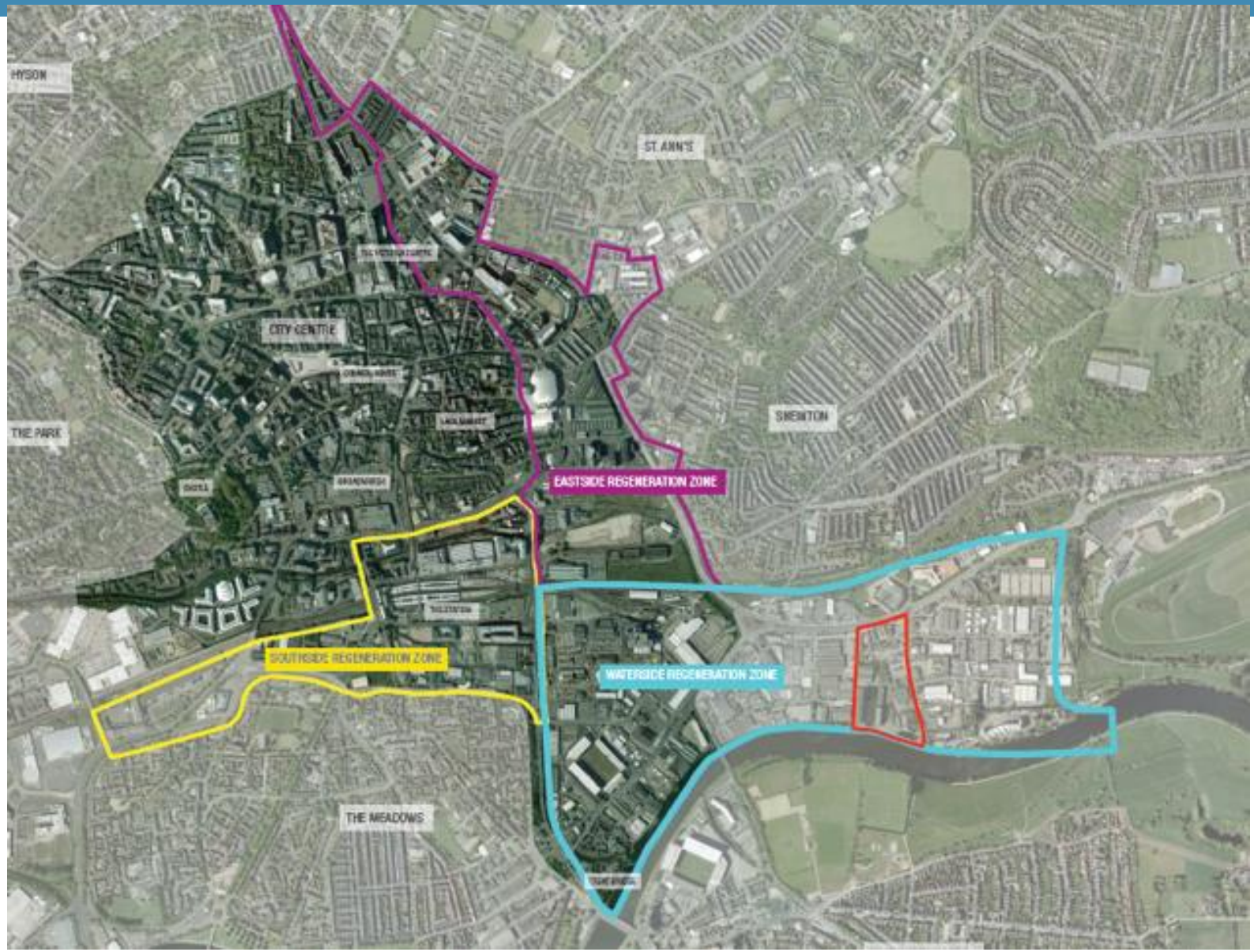
Project SCENe – Technical Overview



Prof Mark Gillott
University of Nottingham

Prof Nick Ebbs
Igloo Blueprint



Innovate UK

SCENe

ERA ENERGY RESEARCH ACCELERATOR

Trent Basin Blueprint Development Site



Innovate UK

SCENe

ENERGY RESEARCH ACCELERATOR

Trent Basin Phases 1-5 Masterplan

















Nottingham - Community Energy Demonstrator – Trent Basin

Aims to develop and investigate:

- Community resilience to changes in energy provision, particularly with regard to finances and infrastructure
- Means to reduce fuel poverty and increase energy security
- A future-proof community energy infrastructure with increased community and grid efficiencies utilising renewable energy systems
- Socioeconomic benefits to individuals and the community
- The formation of neighbourhood ‘hubs/nodes/networks’ to build community capital
- Behaviour change instigated by this bottom-up approach

Innovate UK

SCENe

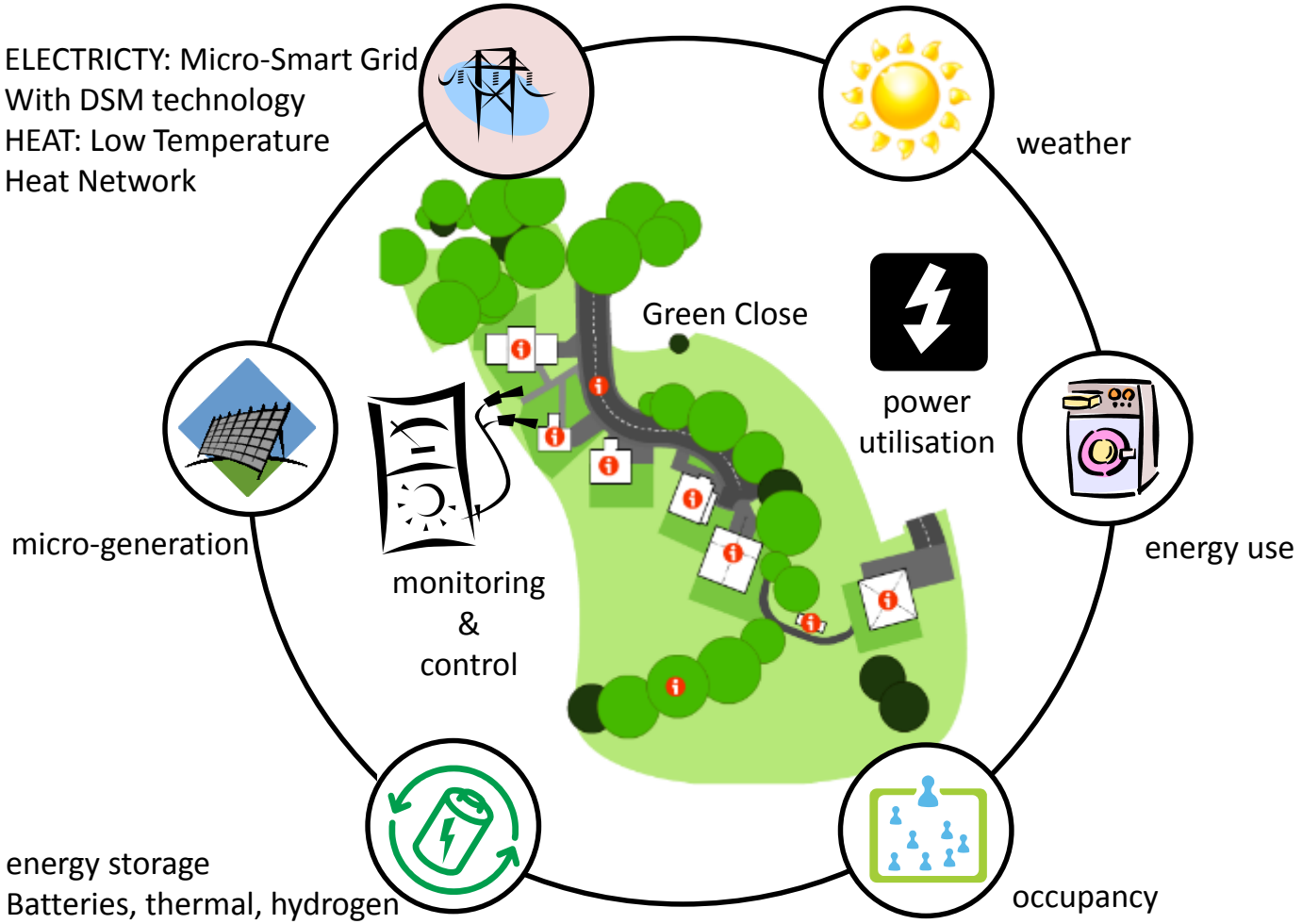
ERA ENERGY RESEARCH ACCELERATOR

Creative Energy Homes: showcase of innovative energy efficient solutions for sustainable homes & communities



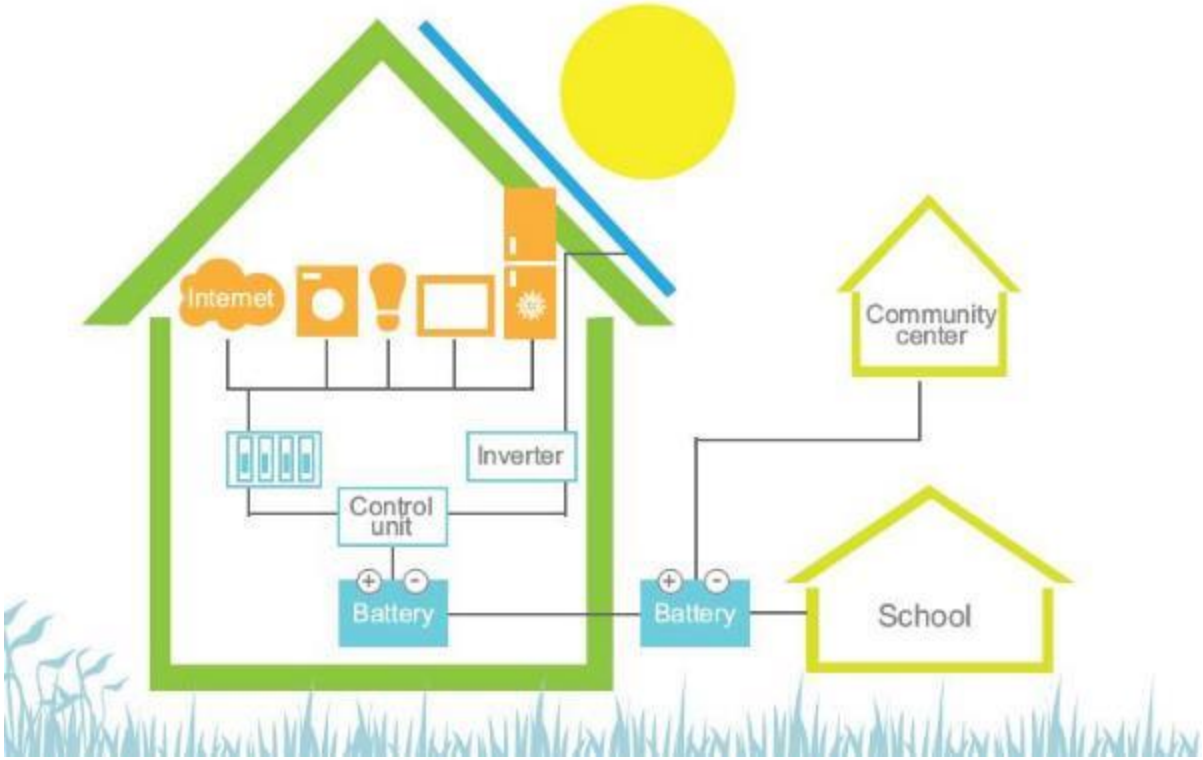
iSEC: intelligent Smart Energy Community

Project Part-Financed by the European Union
European Regional Development Fund



SENSIBLE

Storage-Enabled Sustainable Energy for Buildings and Communities



European Commission

Horizon 2020
European Union funding
for Research & Innovation

SCENe

Sustainable Community Energy Networks

We work with Innovate UK

Sustainable Community Energy Networks

The University of Nottingham
UNITED KINGDOM • CHINA • MALAYSIA

ATKearney

SMARTKLUB
Empowering Cities Together

SOLAR READY

Loughborough University

blueprint

SIEMENS

Stickyworld

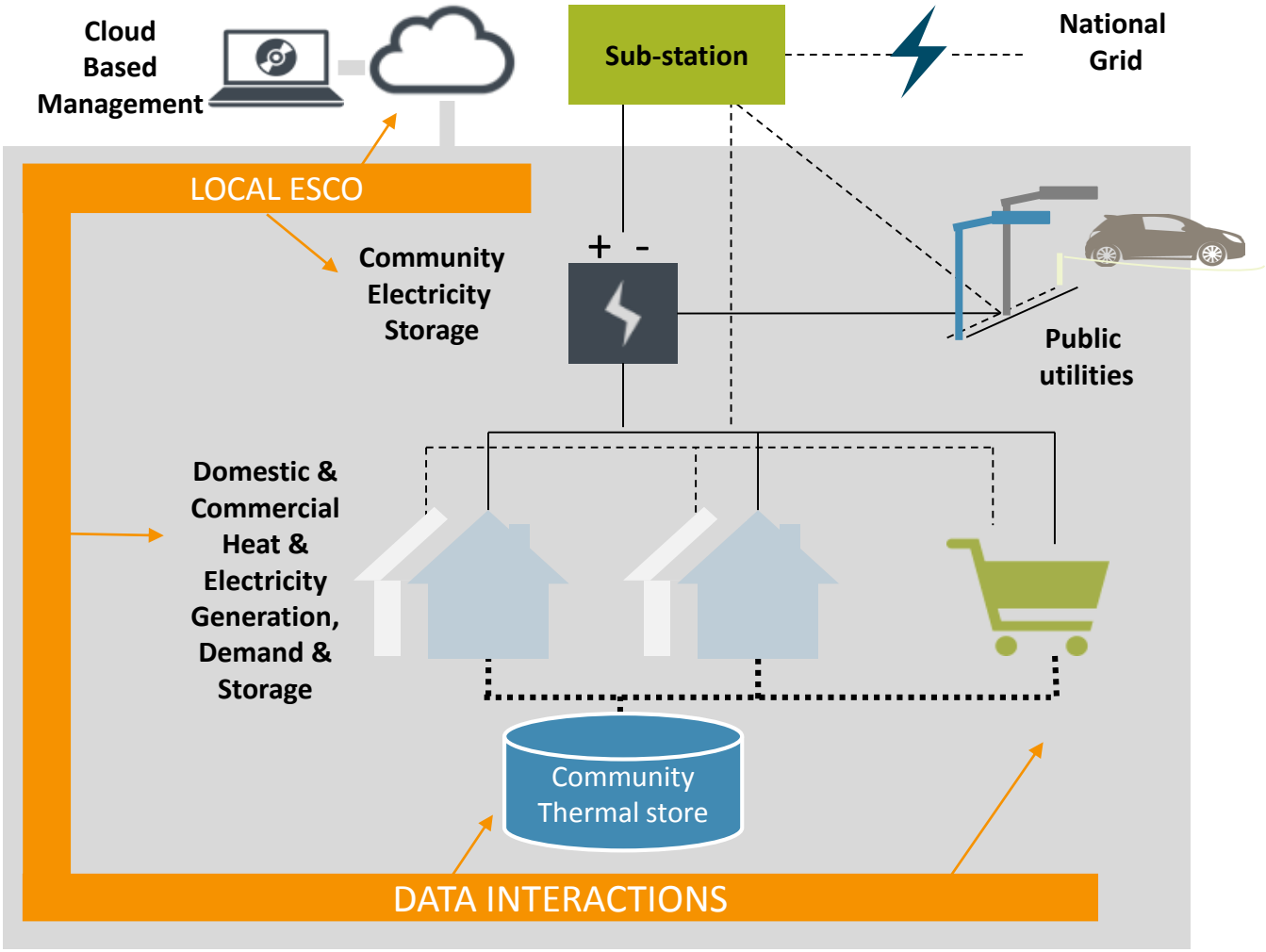
urbed

Slam Jam

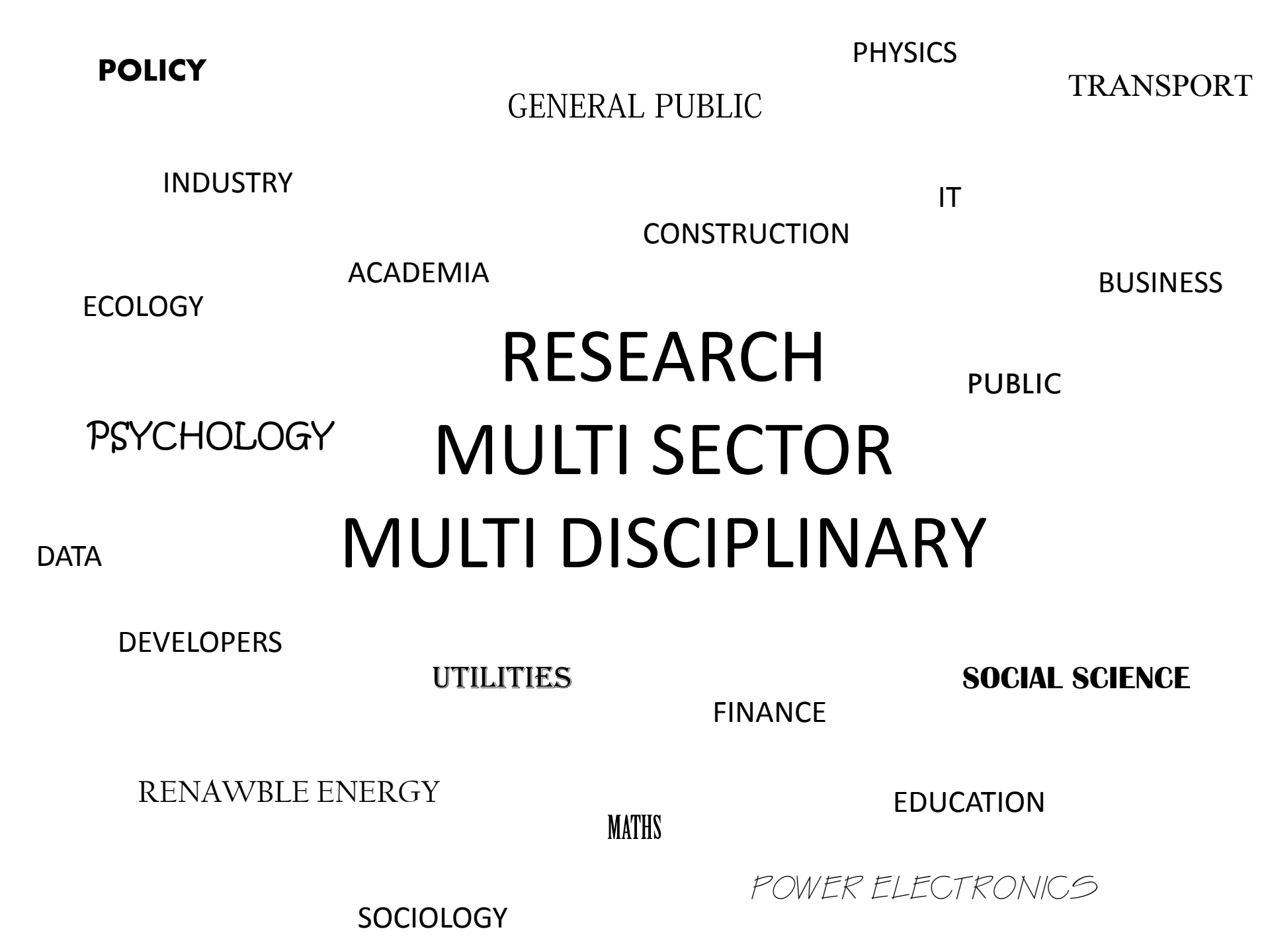
Project SCENe key messages

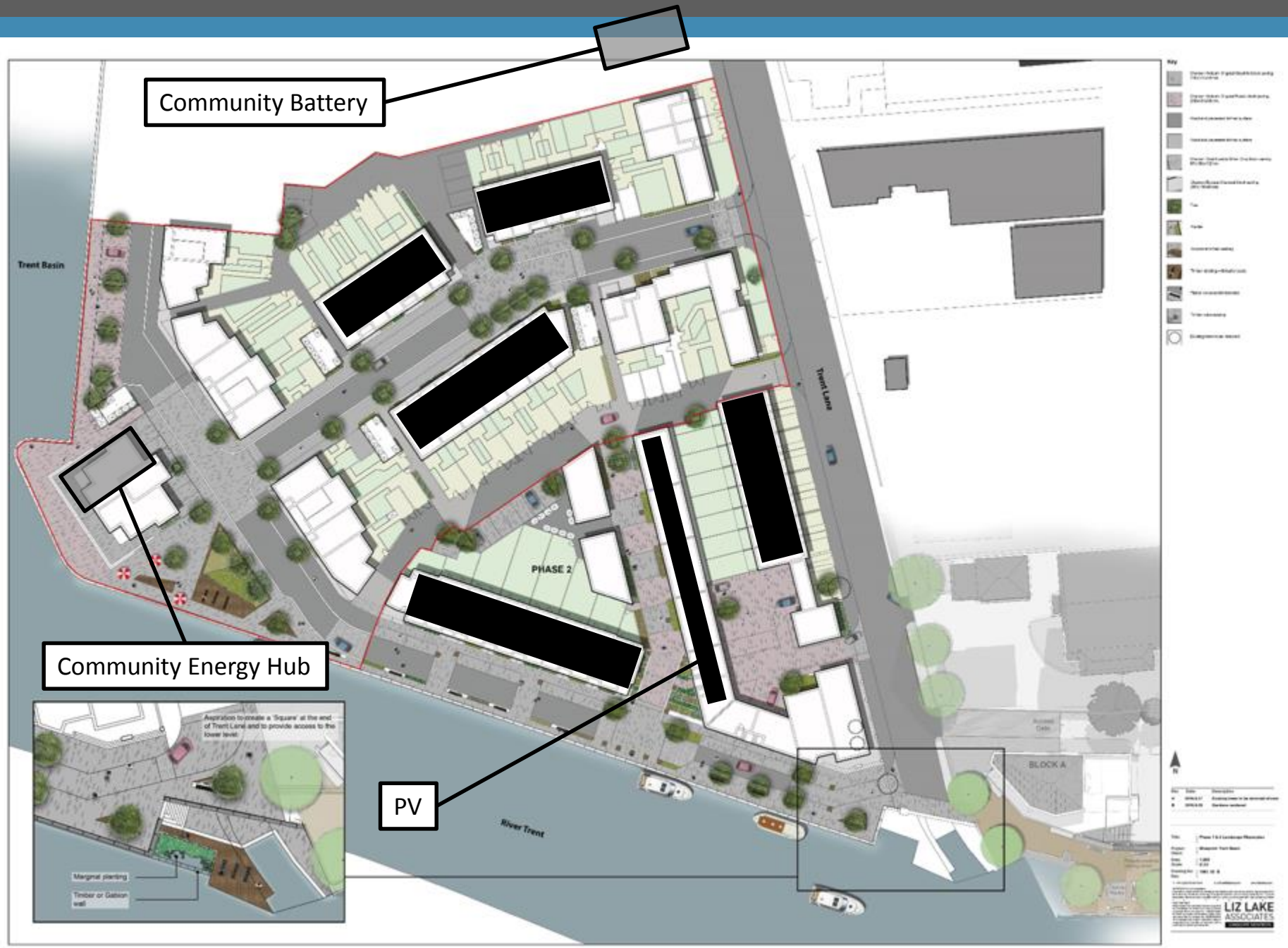
1. Currently NO business model in the UK for community energy that does not require additional subsidy
2. SCENe will **develop a 'subsidy free' commercial model** for new build residential developments
3. The demonstration integrates a new supply chain in a real commercial development, with consumer choice, at scale
4. Results will be disseminated as Business Model Templates that can be used by any developer or ESCO in the UK

SCENe will demonstrate scalable ESCO services

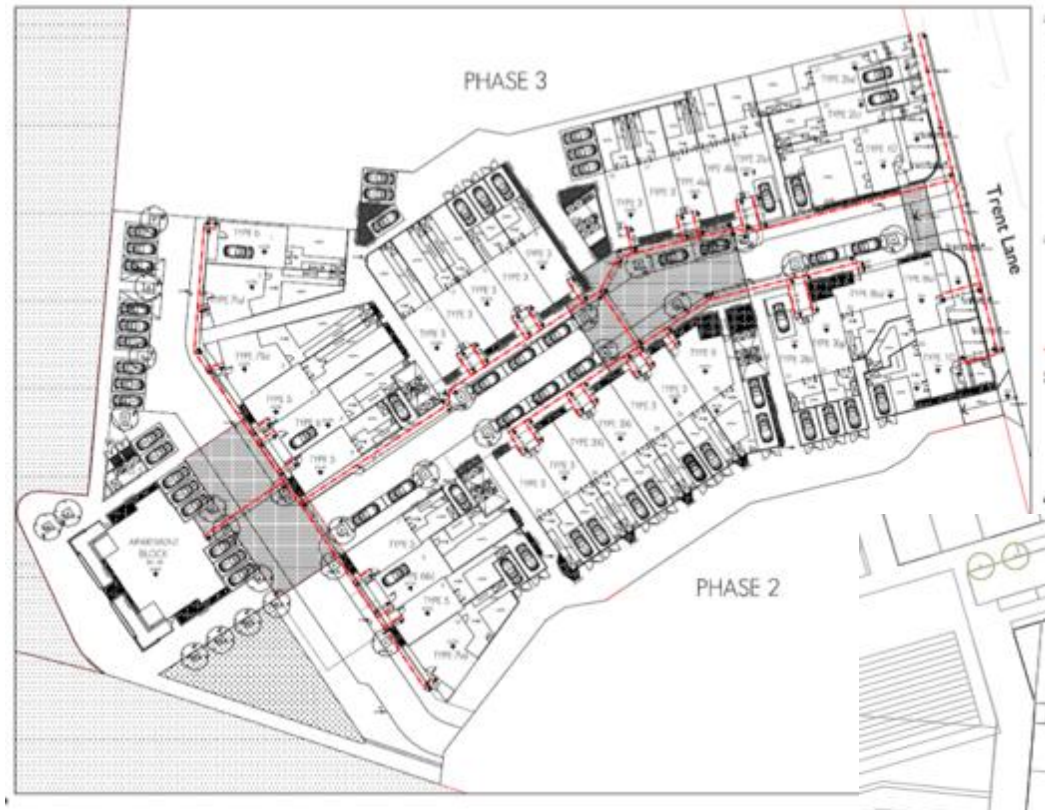


Potential to integrate other value streams such as assisted living, health care and security


POLICY
PHYSICS
TRANSPORT
GENERAL PUBLIC
INDUSTRY
IT
CONSTRUCTION
ACADEMIA
BUSINESS
ECOLOGY
RESEARCH
PUBLIC
PSYCHOLOGY
MULTI SECTOR
MULTI DISCIPLINARY
DATA
DEVELOPERS
UTILITIES
SOCIAL SCIENCE
FINANCE
RENAWBLE ENERGY
EDUCATION
MATHS
POWER ELECTRONICS
SOCIOLOGY



ERA Funded Energy Hubs – Generation, Storage & Use (*people*)



Electrical Infrastructure
Local Power Networks

Community Battery

Located on Trent Lane Adjacent to Local Sub Station
Includes: Distribution boards, ring main and
Substation + Energy Centre – SCADA server,





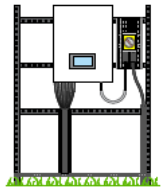
Urban Solar Farm



Community PV

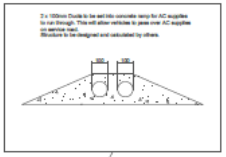




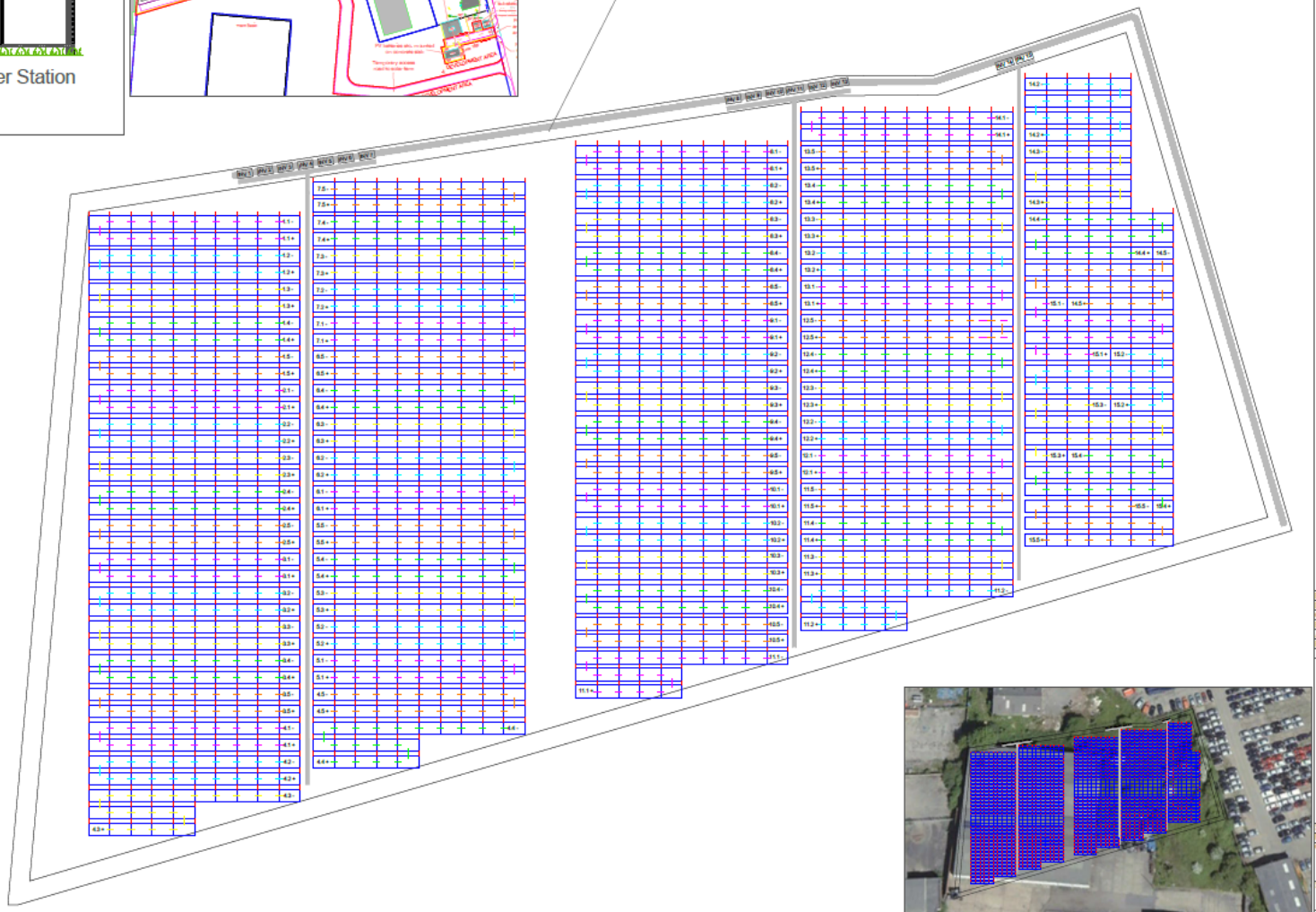


Inverter Station









NOTES:
Inset drawings are not to scale.

REV:	DESCRIPTION:	BY:	DATE:
E	Containment added	DA	16/03/17
D	Inverter 15 added	DA	13/03/17
C	Inverter 14 added	DA	09/03/17
B	Inverters 14-17 removed	DA	20/02/17
A	Inverter 18 removed	DA	10/02/17

REVISIONS

SOLAR READY SOLUTIONS LTD
11 IVANHOE ROAD
FINCHAMPSTEAD
BERKSHIRE
RG40 4QQ

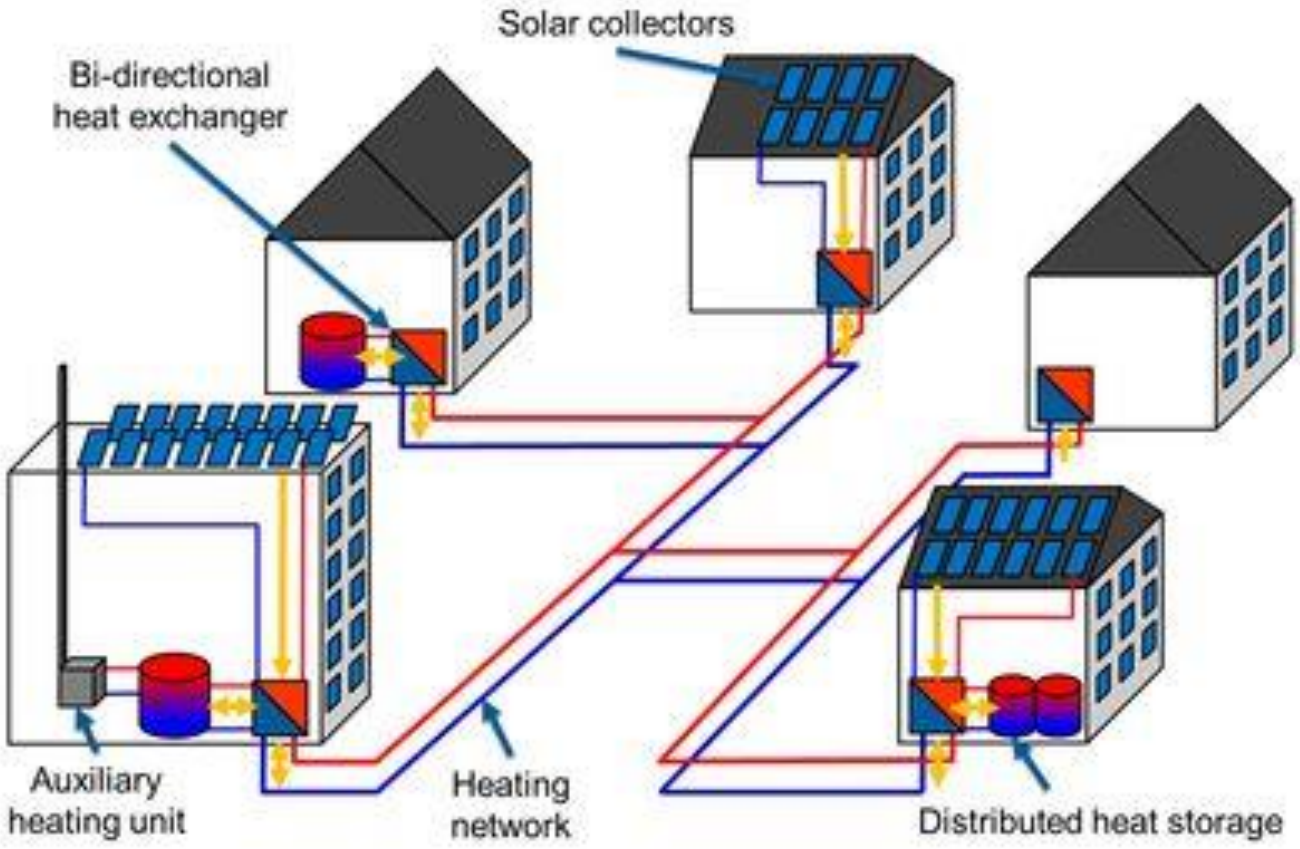
STATUS: FOR CONSTRUCTION
PROJECT NO: C1651
CLIENT: NOTTINGHAM UNIVERSITY
SITE: TRENT BASIN SOLAR PV FARM
DRAWING TITLE: PV FARM LAYOUT
DRAWING NO: C1651-001 REV: E
DRAWN: DA CHECKED: LW
DATE: 08/02/2017 SCALE AT A1: 1:150

SCENe
Sustainable Community Energy Networks

We work with Innovate UK

European Union
European Structural and Investment Funds

HEAT NETWORK





Community Energy Battery – 2.1MWh (largest in Europe)
Installation - January 2018
Energising - March 2018
Grid connection – April 2018

ENERGY CENTRE



Tesla 2.1MWh Battery - 500kW inverter



Low Voltage Distribution Panels



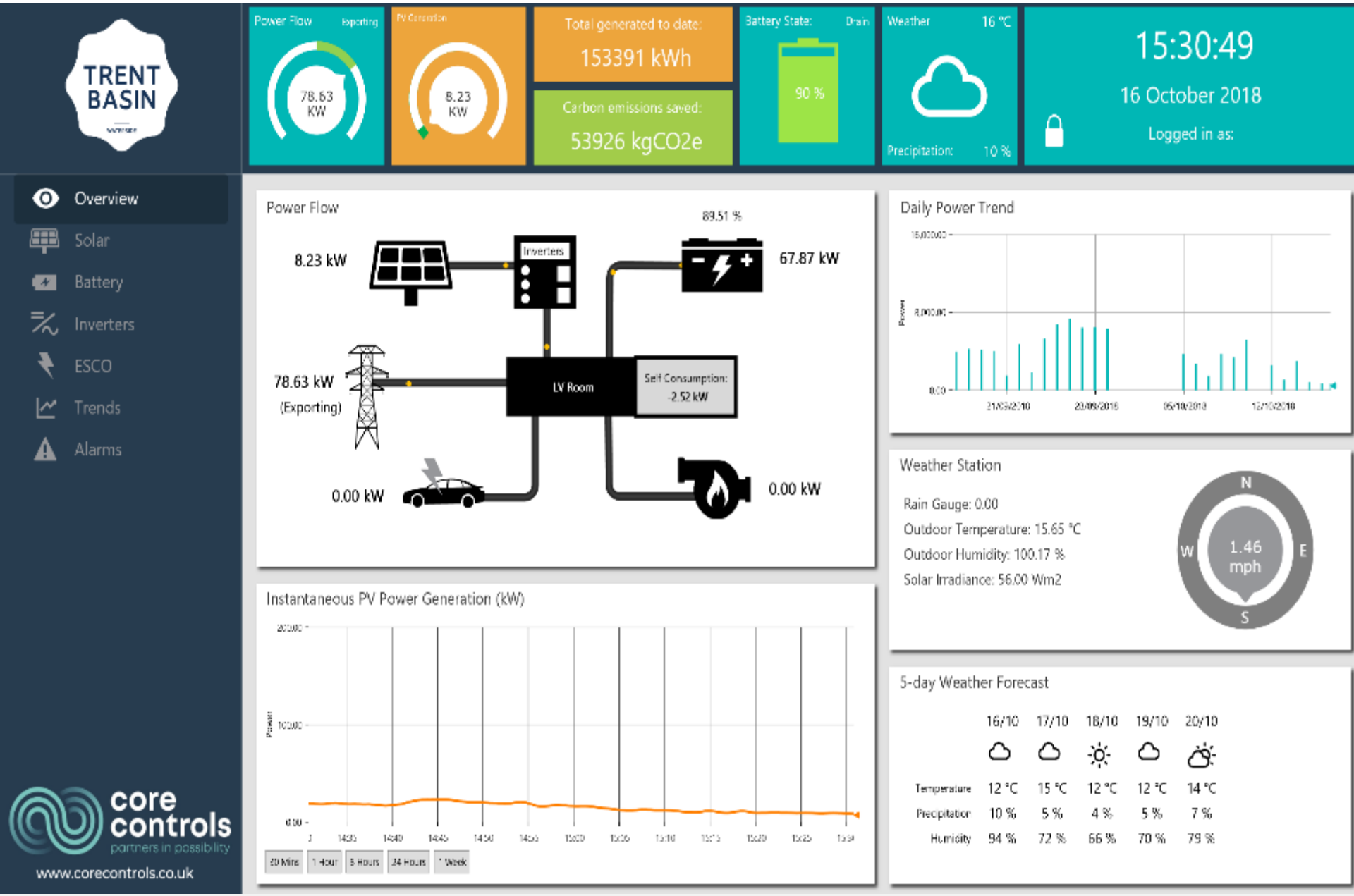
Enclosure - Security and Acoustic Fencing



Energy Centre Sub Station


200 KWp URBAN SOLAR FARM

Trent Basin SCADA System Dashboard



Consumer Engagement



Smart Speaker



Smart Phones



I H D



Tablets

LOG IN

enterprise CarClub

MENU

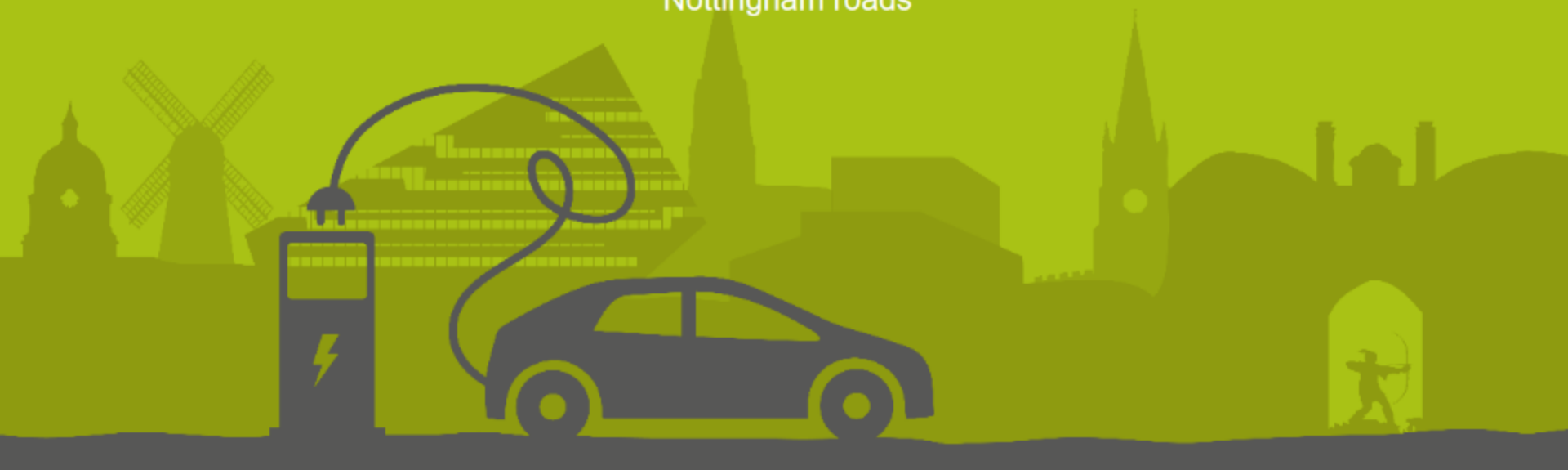


NOTTINGHAM HOURLY CAR & VAN HIRE

Self-Service Vehicle Rental Made Easy

GO ULTRA LOW NOTTINGHAM

Innovative steps to get 8,000 additional electric and hybrid vehicles on to Nottingham roads



EV-elocity



Our ecosystem of partners is looking to develop a new set of offerings using innovative V2G solutions such as dedicated and intelligent parking, loyalty programmes through new data patterns and inside airport individually targeted information. The project will demonstrate the value of this offering via six case studies with a view of scaling deployment across the country and Internationally.

Funded by:

Department for Business, Energy & Industrial Strategy

Office for Low Emission Vehicles

Innovate UK

AT Kearney · WMG · Leeds City Council · Honda The Power of Dreams · University of Nottingham · Nottingham City Council · ecar A Europcar Company · EVB · brixworth · Land & Property · cenex · TOTO energy

RobinHoodenergy

Home energy | Business energy | About us | Get a quote

Not for profit

Proud to be different from other energy companies.

As a not for profit company, we like to do energy differently.

Launched by Nottingham City Council, our mission is to provide low cost energy to all households. No private shareholders. No director bonuses. Just low and competitive energy tariffs. Because we know that no-one wants to overpay for their gas and electricity we work hard to keep our prices low and competitive to help our customers save money on their energy bills.

As the UK's first local authority owned energy supply company, we set ourselves apart from the 'Big Six' and many other private sector energy companies.

We make it easy to switch to Robin Hood Energy, we keep customers on a low price when they renew with us and don't apply exit fees if they decide to leave their account early. Our entire switching process is designed to help residential and commercial customers nationwide save on their energy bills.



ESCO – HEAT & POWER – BUSINESS MODELS

Community Energy Data

Design and installation of the cloud based data acquisition platform for real time monitoring platform for performance evaluation and informed control of home thermal/electricity energy generation, distribution, utilisation and storage across the CES at home (x120) and community scales (community batteries and thermal stores)



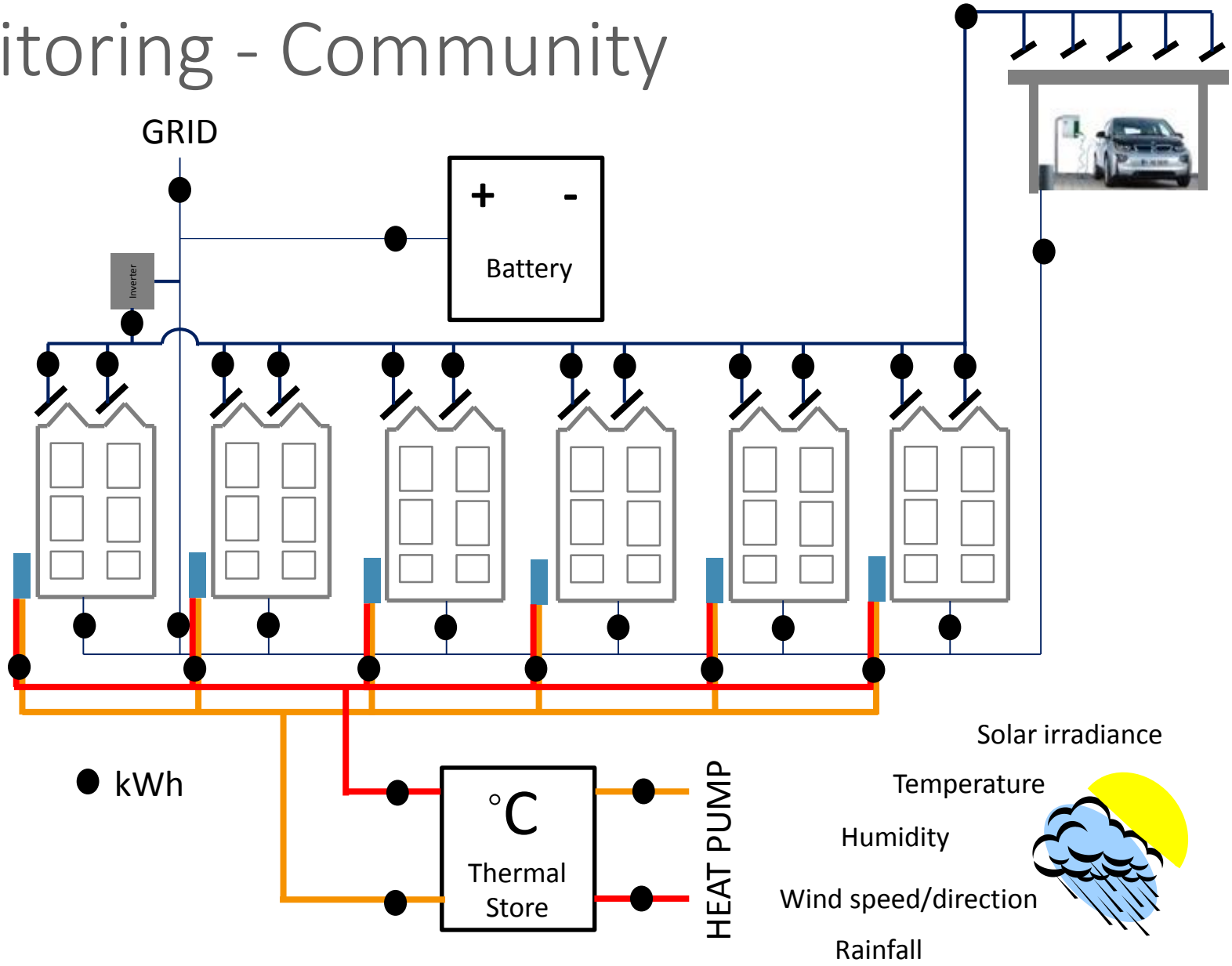


DATA SETS

- Design of the cloud based data acquisition platform for real time monitoring and control of home
- Data set will also include indoor environmental data (temperature, humidity and CO2) in addition to local weather data. Installation and commissioning of the monitoring system will be carried out such that each home has a local hub with data storage communicating to a network of EnOcean energy harvesting wireless sensors
- Local hubs will communicate with a dedicated community energy server located in the energy centre via fibre optic cables and then to cloud storage for the CES via broadband
- Data sets will be cleaned and presented through the web based data visualisation platform for the individual home hubs and for the community energy hub
- Real time and historical trend values for savings of energy, carbon and cost will be evaluated to optimise home and community energy utilisation

ENERGY RESEARCH ACCELERATOR

Monitoring - Community



Monitoring - Home

Temperatures

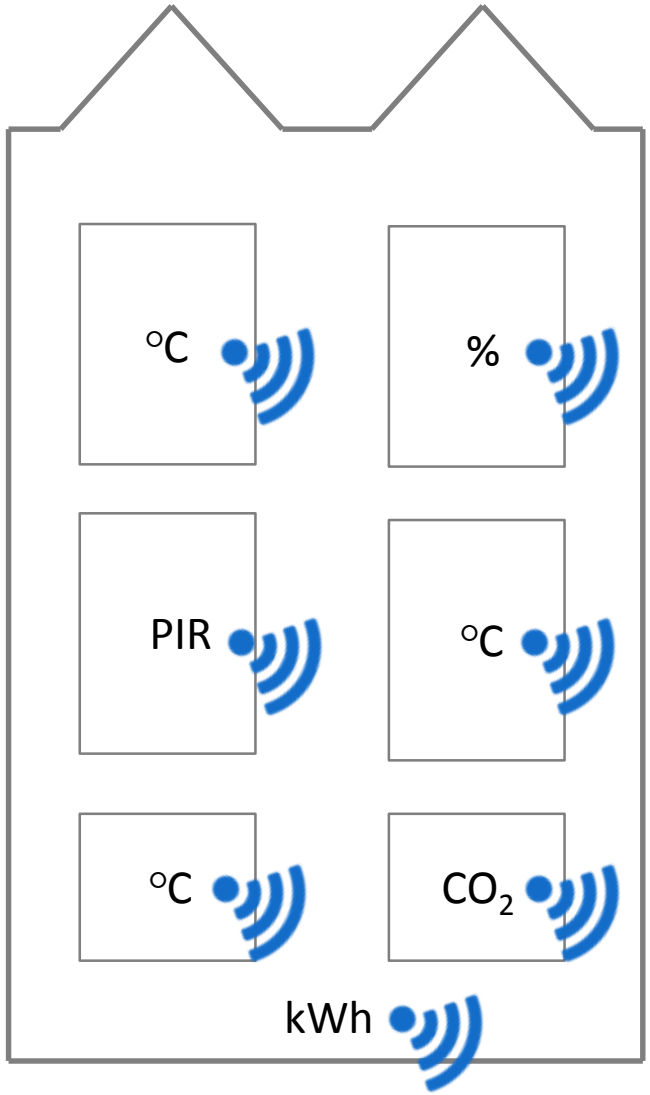
Relative Humidity

Carbon Dioxide

Occupancy

Electrical Energy
- Total Electricity
- Circuits
- Significant Appliances

Thermal Energy
- Hot Water
- Space Heating



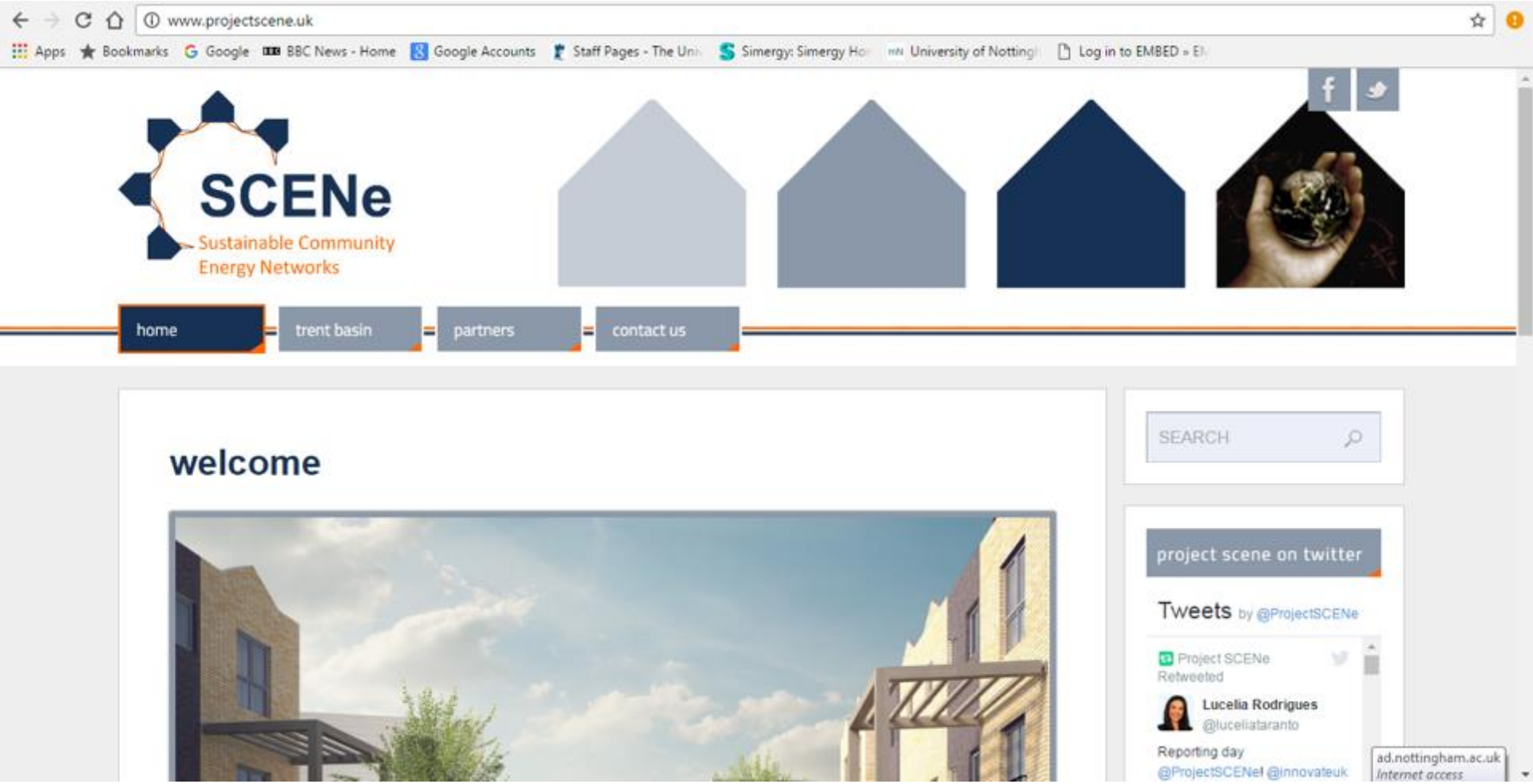
CLOUD SERVER





Energy Centre

www.projectscene.uk



BUILD & ENERGY REVOLUTION

We need to innovate & do things differently!

Wells & Edison had the foresight over 100 years ago….

"I find it incredible that there will not be a sweeping revolution in the methods of building during the next century. A few energetic men might at any time set out to alter this."

- H G Wells, Anticipations, 1902



"You see, we should make use of the forces of nature and should obtain all our power in this way. Sunshine is a form of energy, wind and sea currents are manifestations of this energy. Do we make use of them? Oh no! We burn forests and coal, like tenants burning down our front door for heating. We live like wild settlers and not as though these resources belong to us."

- Thomas A.Edison, 1916

