The Storage Opportunity Breakout Session

Faye Tomson

Energise Barnsley

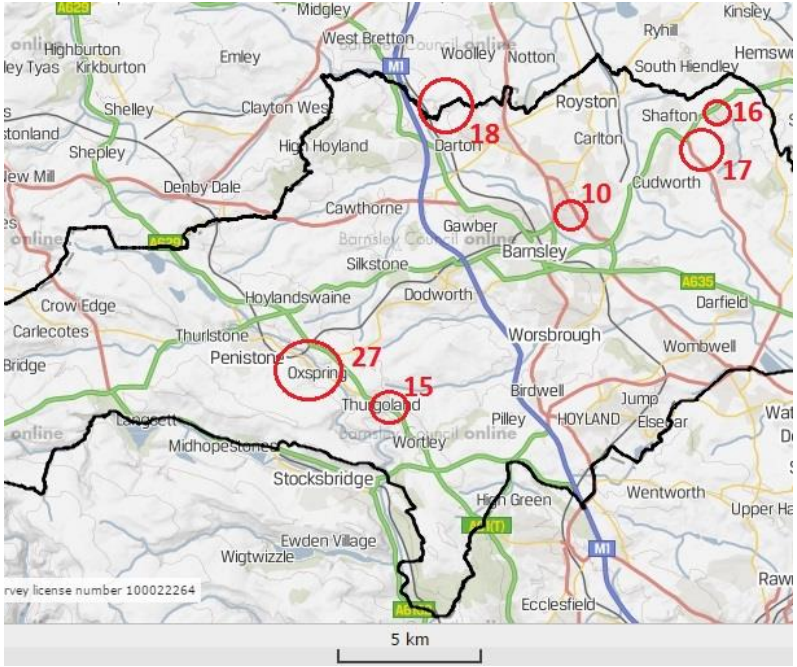
Residential Battery Storage (with PV & without)

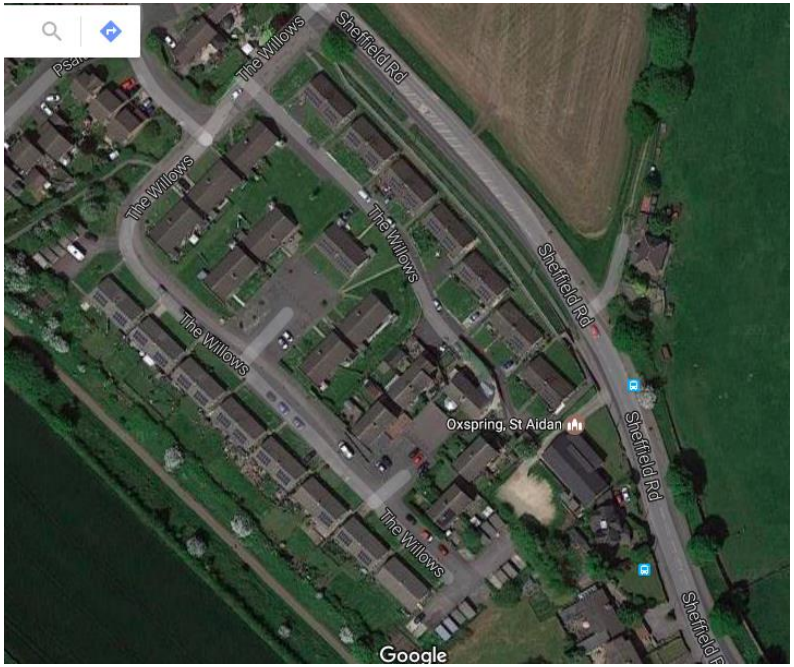
- Faye Tomson – Energise Barnsley Director
- Energise Barnsley launch August 27th 2015
- 321 Residential (Berneslai homes) fitted with solar PV
- 16 Commercial buildings (Barnsley Metropolitan Borough Council)
- 40 Residential batteries fitted (27 houses with solar PV, 9 with no PV)

Research & Funding

- Collaboration agreement between Northern Powergrid, Energise Barnsley & Moixa
- Ofgem – Electricity Network Innovation Competition (NIC)
- Two – Year Demonstration project

Oxspring, Barnsley





Micro - Grid

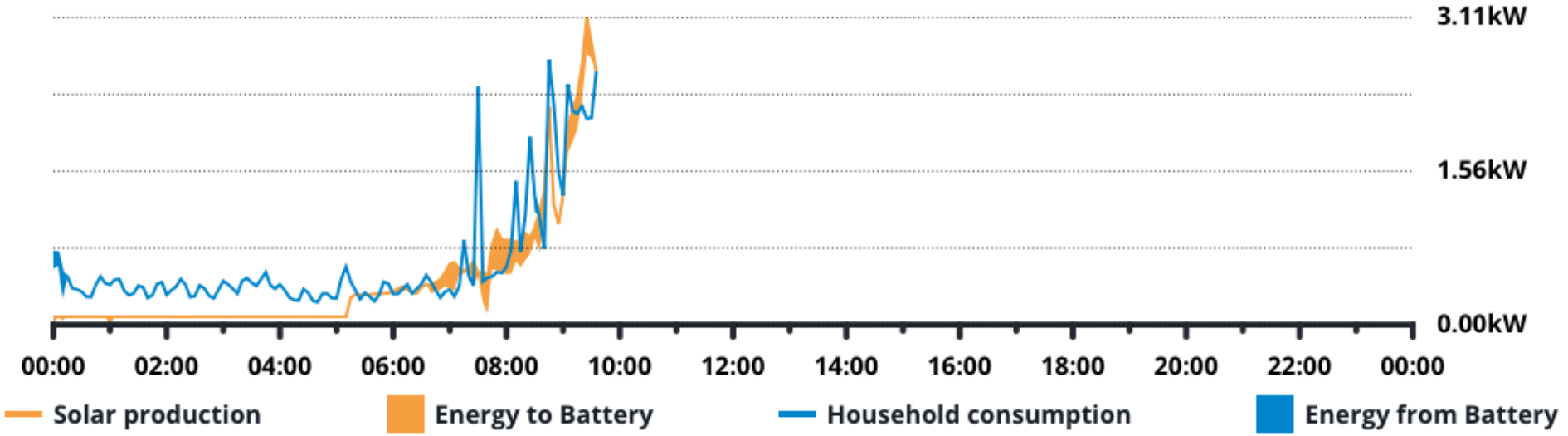
- Feeder 2 – 37 properties, 15 with PV (42% penetration)
- Feeder 3 – 55 properties, 11 with PV (20% penetration)
- Green shading – PV
- Solar PV refused - X

The residents

- Tenant engagement
- Aesthetics
- Installation
- Demographics
- Energy Tariffs
- Learning Curve

Data

Stored energy



Contact: Faye Tomson 07478 246298
Faye@energisebarnsley.co.uk

Contact: Andy Heald 07899891667
Andy@energisebarnsley.co.uk

Powering Together

#CEconf17

#CEF17

24th June – 9th July 2017

Dudley-Moor Radford

Moixa


Soon every home will run on batteries
moixa
Dudley Moor-Radford, Managing Director
June 2017

What we do

UK's leading designer of battery systems

Smart IoT Battery

- Mass market
- Compact all-in-one
- Retrofit or new

GridShare Software

- Aggregate VPP
- Grid services

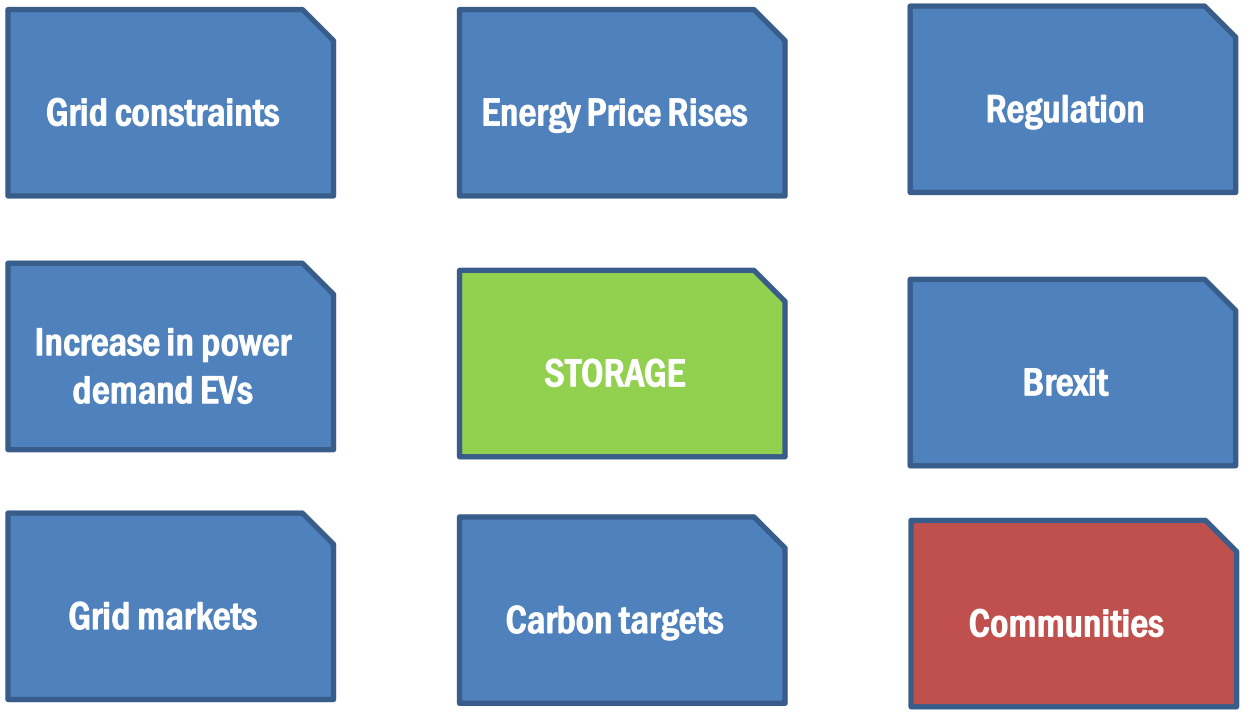
Housing Partnerhsips

- Solar + Storage
- Smart Tariff delivery
- Grid Services income

Asset Funding

- Funds
- SPVs
- Leasing

The Energy tipping point



Moixa Overview

UK leading residential smart energy platform

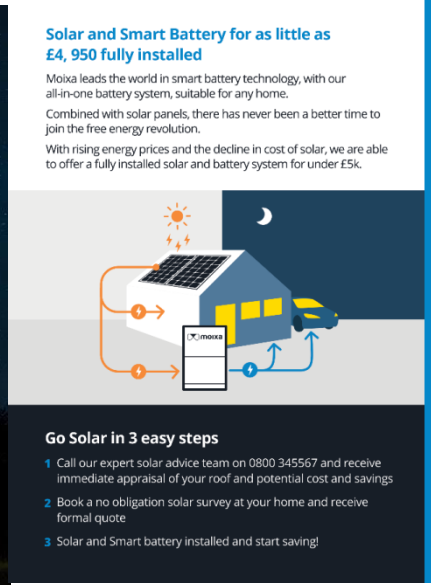
- **Battery Operator Platform:**
  1. Smart IoT Battery Hardware
  2. Cloud aggregation Platform “GridShare”

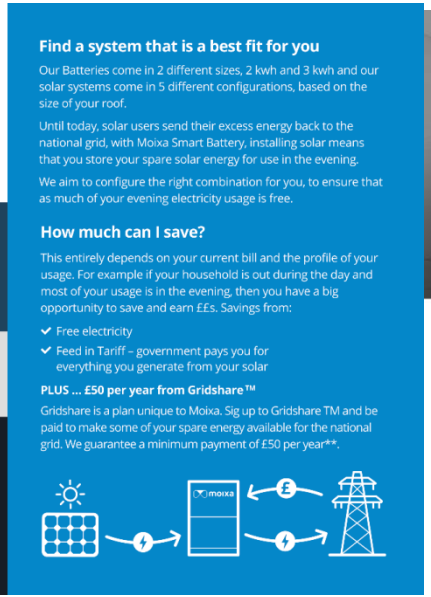
- **Projects** with British Gas, Scottish Power, Network operators and Social landlords -> 1000 installs & data

Mass market platform

moixa

Our offers





Moixa has been developing batteries for over 10 years and leads the world in smart storage technology, with our all-in-one battery system, suitable for any home. Choose between a 2 kwh or 3kwh system, both are small wall mounted units and take under and hour to install. They come with ongoing warranty* and are connected to the web. Simple.

Call us now on 0207 734 1511 for a free survey and quote.
Or visit www.moixa.com/contact/

**must be signed up to Gridshare. **Refer to Gridshare Ts and Cs.*

moixa

Our offers

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Moixa Smart Battery

What all solar houses have been waiting for!

FREE electricity at night

Prices start at

£2,950

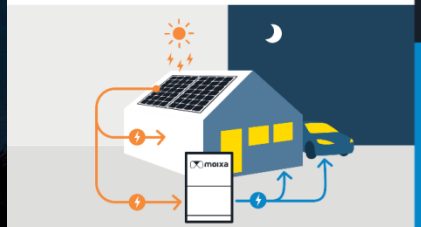
inc. VAT inc. install

Maximise the potential of your solar panels

As the owner of solar panels you are generating energy during the day, and the chances are, that much of this energy is being sent straight back to the grid.

Now you can keep the energy you create and store it on a Moixa Smart Battery to use for free at night – thereby ensuring you are maximising the value of solar.

Up to a half of our customers' electricity usage comes from a Moixa Smart Battery and solar.



"Solar charges the battery during the day - for you to use at night"

Earn an extra £50 per year with Gridshare ™

With Moixa's unique Gridshare platform, you are able to earn even more if you make your smart battery available for grid services. By signing up to Gridshare, we will pay you a minimum of £50 per year** on top of the savings that you will also be enjoying.

- Feed in tariff payments not be affected
- 1 hour install
- Generate extra income through Gridshare
- Provides back up during power cuts
- Personalised App showing your charging and savings

Moixa has been developing batteries for over 10 years and leads the world in smart storage technology, with our all-in-one battery system, suitable for any home. Choose between a 2 kwh or 3kwh system, both are small wall mounted units and take under and hour to install. They come with ongoing warranty* and are connected to the web. Simple.

Call us now on 0207 734 1511 for a free survey and quote.

Or visit **www.moixa.com/contact/**

**must be signed up to Gridshare. **Refer to Gridshare Ts and Cs.*

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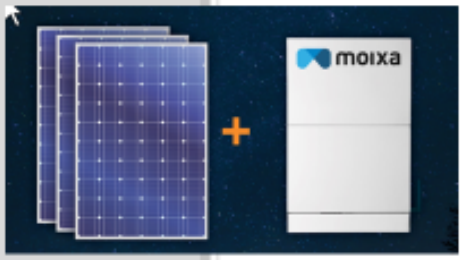
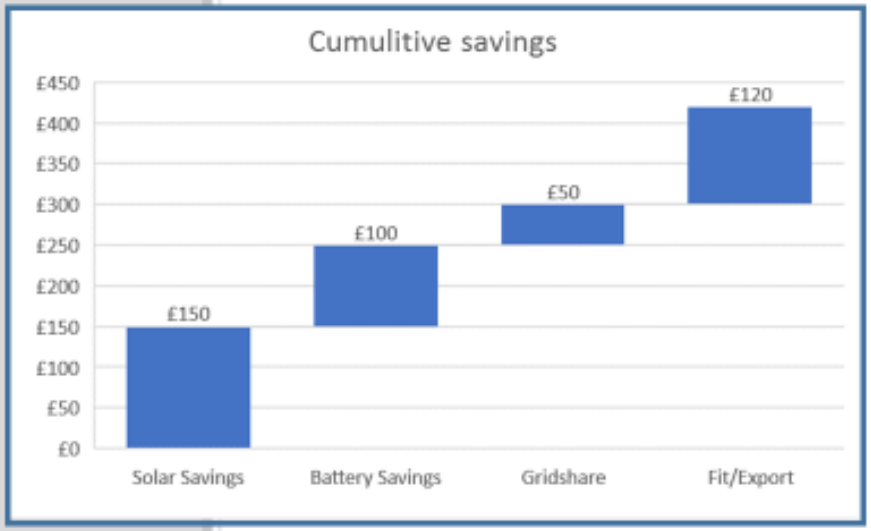
Potential savings

Based on:

- 3kWp Solar (12 panels)
- 4,000 total consumption
- Fit rate at 4.11p + Export 4.8p
- 1 battery discharge per day
- Assumptions on energy price rises

PLUS option of Economy 7





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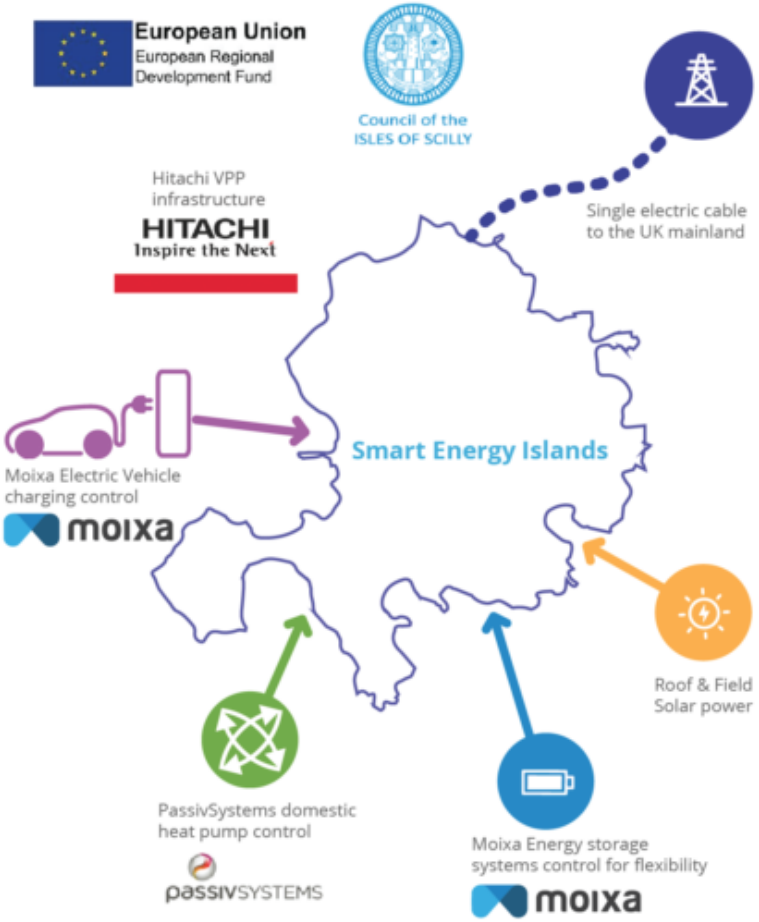
GridShare case study

Smart Energy Islands Partnership with Hitachi

Smart City (IoT) infrastructure project, using Island location as a test bed for the smart city.

Moixa role: Acting as an aggregator for both Domestic Energy Storage and EV charge points, managing fleet of systems

Hitachi Role: Acting as the client for aggregation services (Utility / DNO)



City Scale energy control **Collaboration** **£10m+** moixa

Pilots & Projects

Validated across:

- £4m of projects
- 5m run-hours of data
- 650+ systems

Scottish and Southern Energy Power Distribution
SCOTTISHPOWER
Oxford City Council
Innovate UK Technology Strategy Board
NEA
Department of Energy & Climate Change
Colchester Borough Homes
British Gas
Western Power Distribution
Good Energy
The co-operative energy
Northern Powergrid
UK Power Networks
Camden
the guinness partnership
nep nottingham energy partnership
Riverside

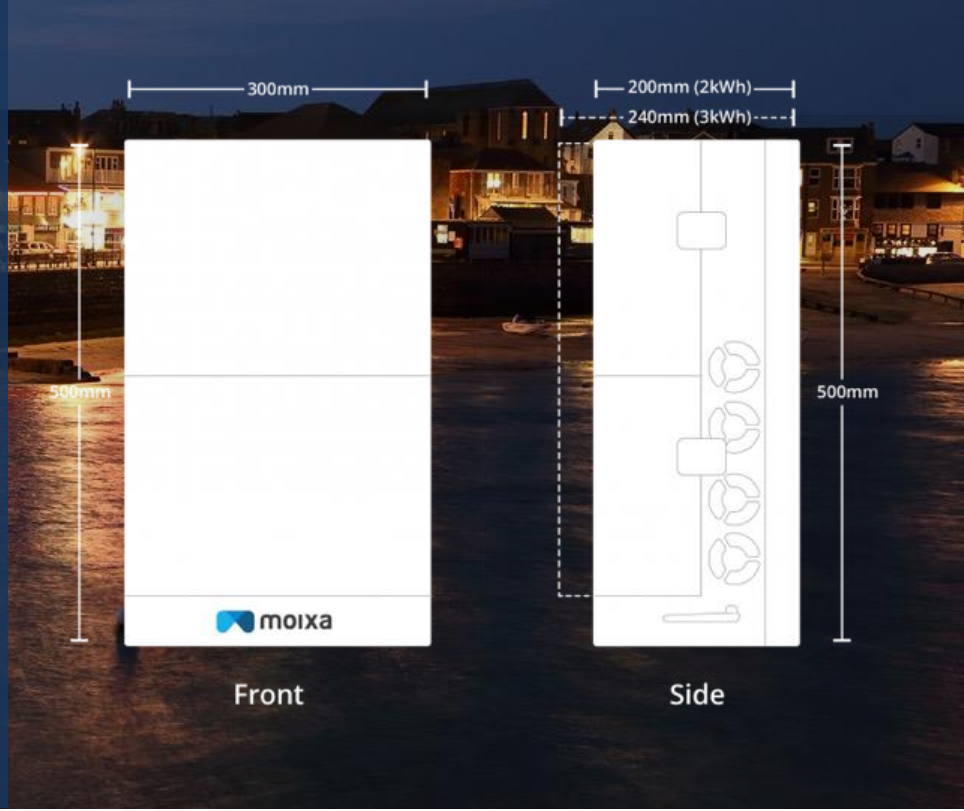
moixa

The Great Village Green Crusade

Moixa Smart Battery

Compact mass market unit

- **AC Coupled:** Battery, Inverter, Smart Control
- **Right sized:** 2 or 3kWh module
- **Economic Benefits:**
  1. Increases solar self-consumption
  2. Night or smart tariff arbitrage
  3. **GridShare** services income
- Other: back-up, smart, CO2, independence
- **Low cost:** ~£2000 (and reducing)









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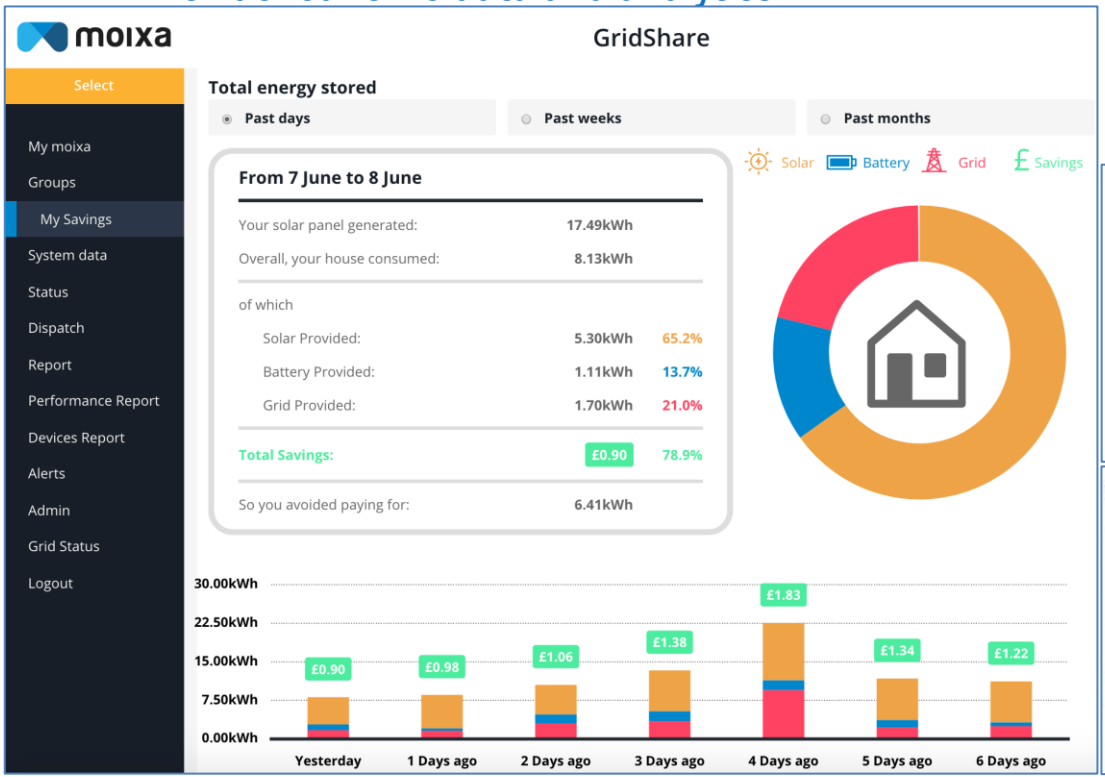
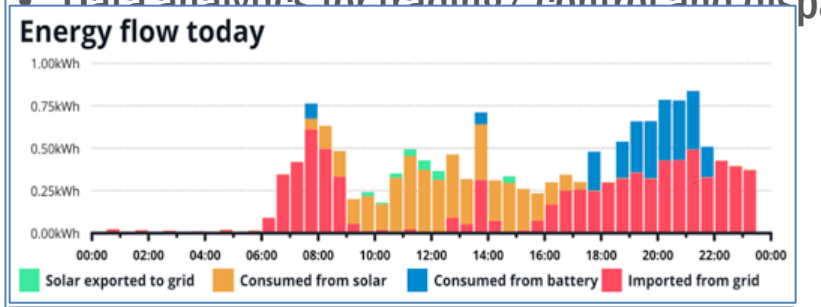
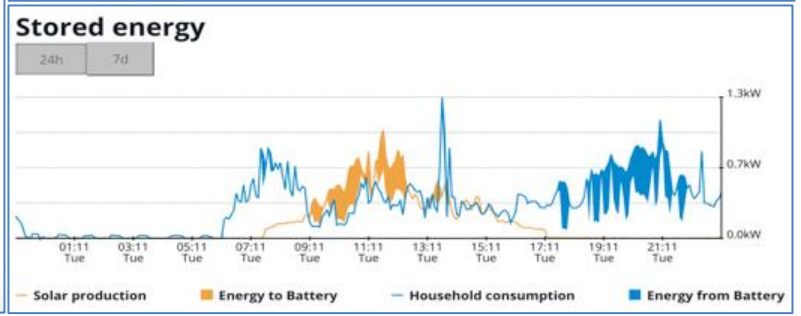
Smart Dashboards

Provide real-time data and analytics

- Customer Interface
- Utility and stakeholder Dashboard
- Remote O&M and over the air upgrade
- Data analytics for trading / control and disp







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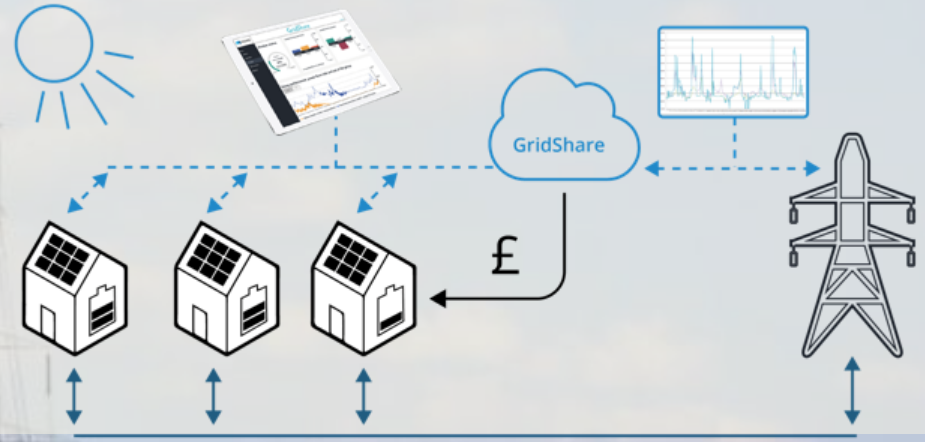
GridShare Platform

Aggregates batteries for services

Manage behind the meter to front of meter trading, flexibility, balancing and grid-level services



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Download data sets (CSV): Download | Links | Info

New! Gridwatch France

G.B. National Grid Status

Data courtesy of Elexon portal and Sheffield University

Demand 31.44GW

Frequency 50.157Hz

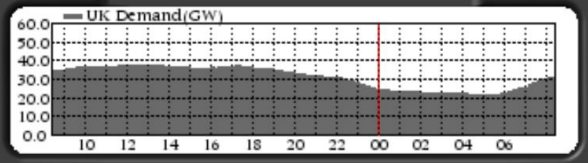
Coal 0.30GW (0.95%)

Nuclear 7.90GW (25.13%)

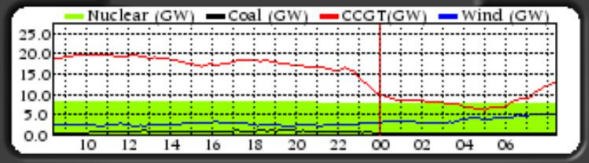
CCGT 13.04GW (41.47%)

Wind 5.28GW (16.79%)

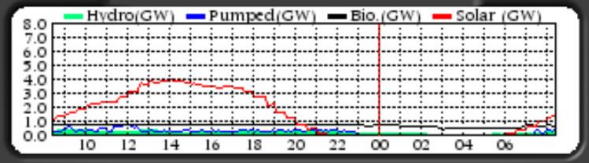
Daily Demand (GW)



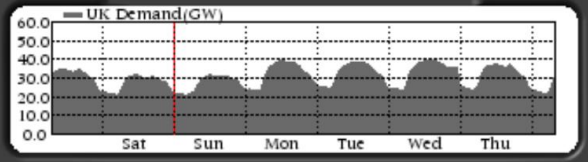
Daily Nuclear/Coal/CCGT/Wind (GW)



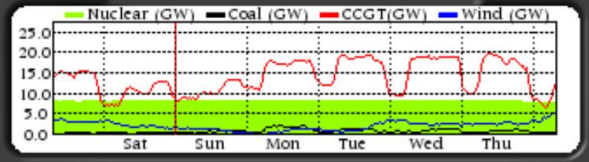
Daily Hydro/Pumped/Bio. (GW)



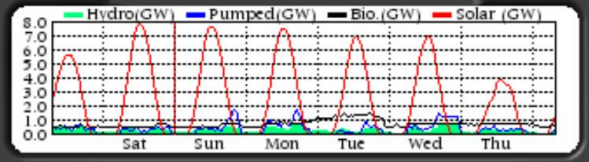
Weekly Demand (GW)



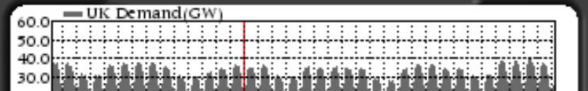
Weekly Nuclear/Coal/CCGT/Wind (GW)



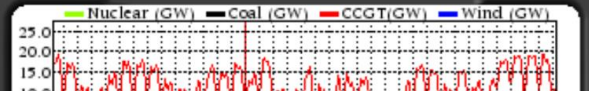
Weekly Hydro/Pumped/Bio. (GW)



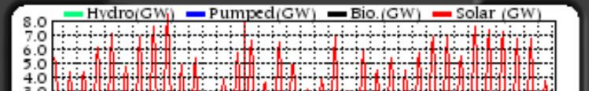
Monthly Demand (GW)

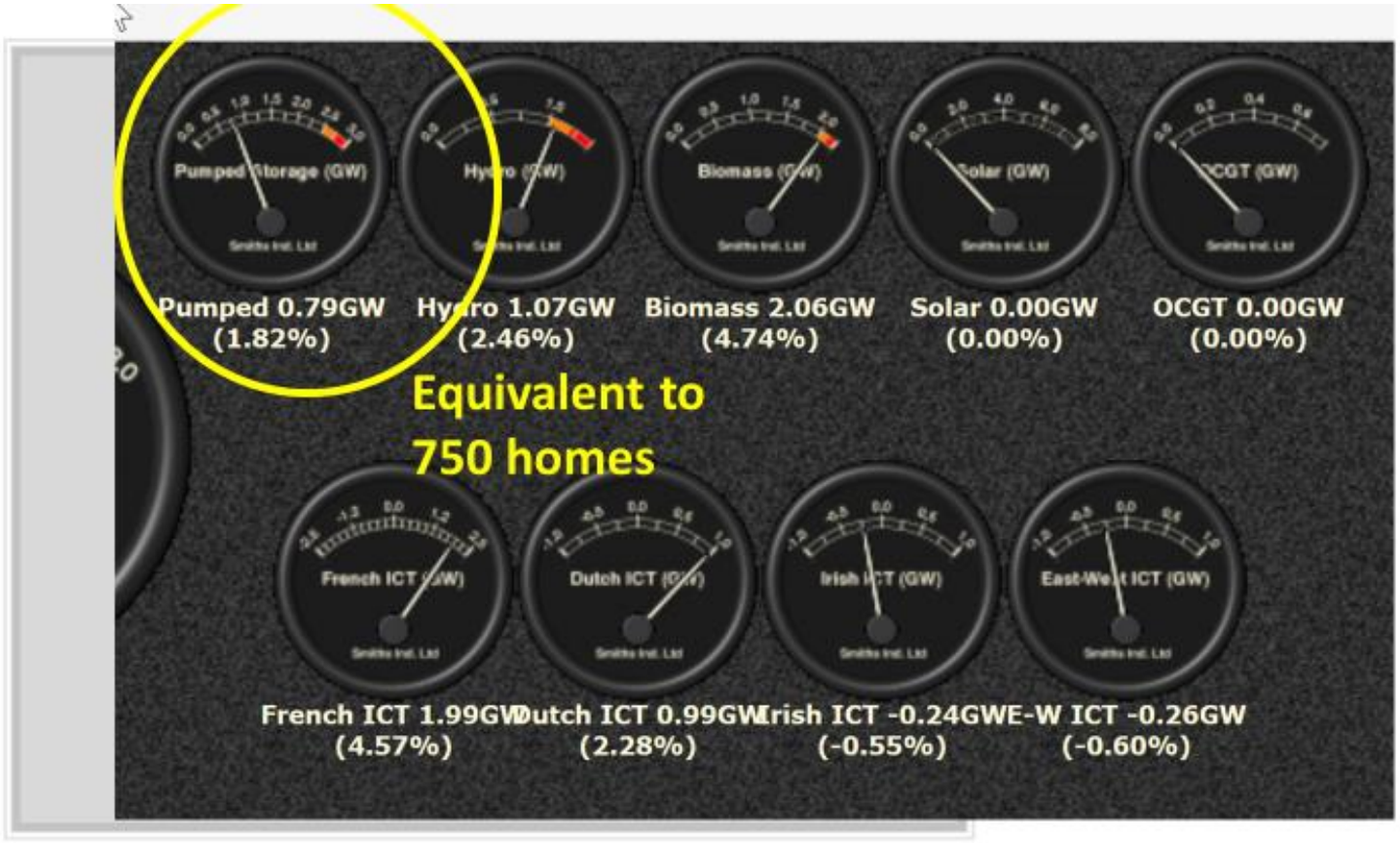


Monthly Nuclear/Coal/CCGT/Wind (GW)



Monthly Hydro/Pumped/Bio. (GW)




Pumped Storage (GW)
Hydro (GW)
Biomass (GW)
Solar (GW)
OCGT (GW)
Pumped 0.79GW
(1.82%)
Hydro 1.07GW
(2.46%)
Biomass 2.06GW
(4.74%)
Solar 0.00GW
(0.00%)
OCGT 0.00GW
(0.00%)
Equivalent to
750 homes
French ICT (GW)
Dutch ICT (GW)
Irish ICT (GW)
ICT (GW)
French ICT 1.99GW
(4.57%)
Dutch ICT 0.99GW
(2.28%)
Irish ICT -0.24GW
(-0.55%)
E-W ICT -0.26GW
(-0.60%)

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GridShare Overview

Cloud

Scalable

Flexible

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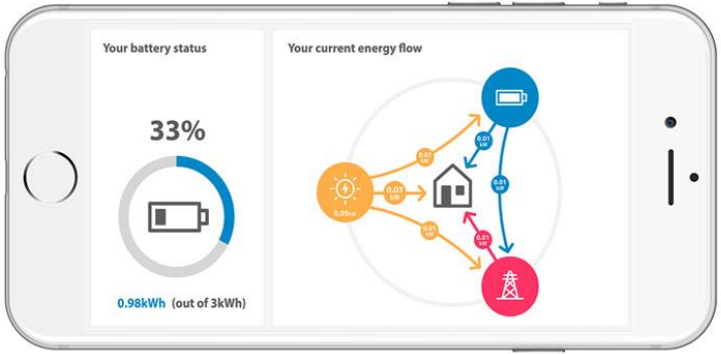
User interface

Control Dashboards



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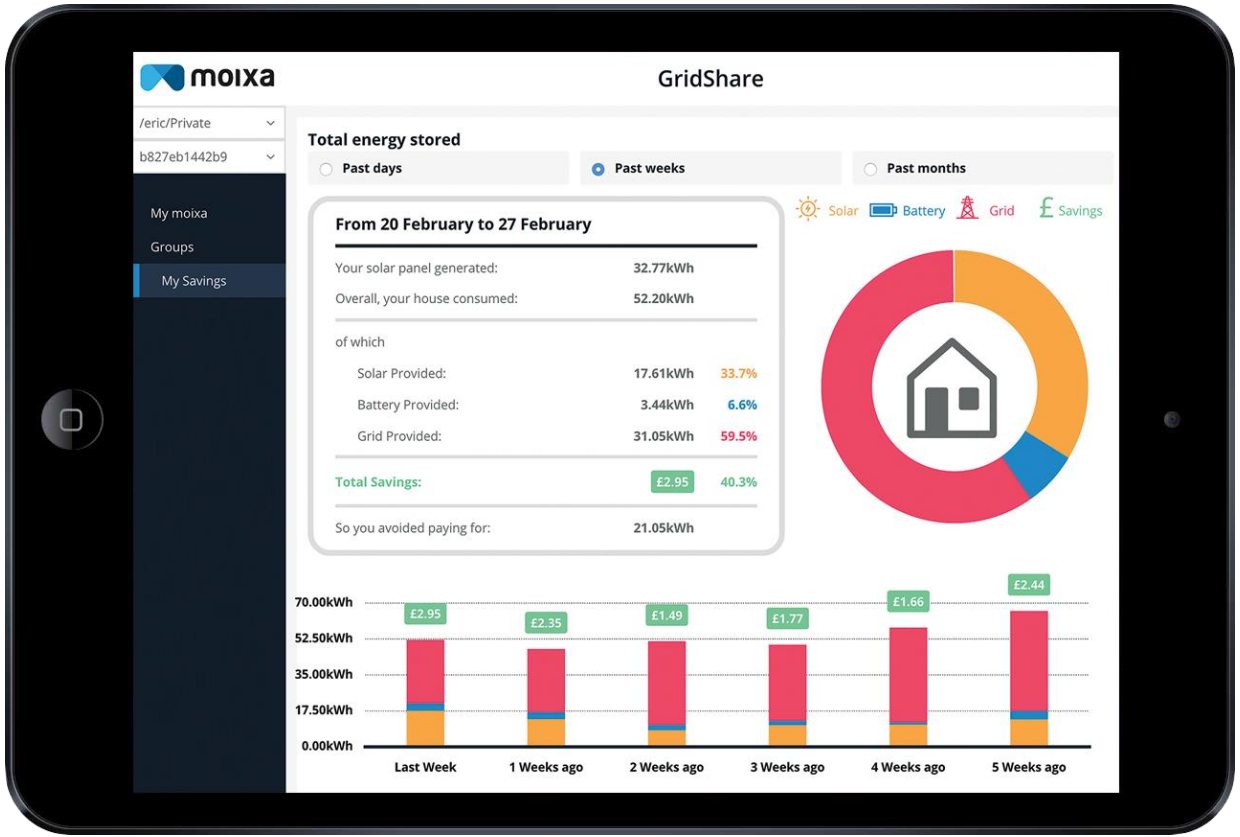
User interface

My savings



Summary reporting

Customer letters

moixa GRIDSHARE

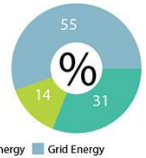
PROJECT ERIC

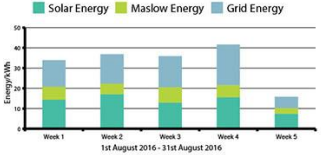
Tue Sep 13 11:34:06 2016

Here is a quick update on how your Maslow system (serial number b827eb55f207) is saving you energy. Below are some diagrams to explain how your system is performing and the amount of energy that you have saved. The figures below are based on the data collected from your Maslow, so please note that they may differ slightly from your energy bill. We have assumed that you pay £0.14 per unit (per kWh) of electricity, which is an estimated price.

Your energy usage last month:

Your solar system generated:	134kWh	
Overall, your house consumed:	164kWh	
Of which:		
Solar Provided:	51kWh	31%
Maslow Provided:	22kWh	14%
You bought from the grid:	91kWh	55%
Total Savings last month:	£10.23	45%
So you avoided paying for:	73kWh	





Thank you very much.

Sincerely,

Alex Alexeev
Project Manager, Moixa Technology Ltd

moixa GRIDSHARE

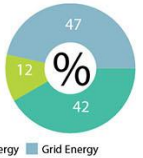
PROJECT ERIC

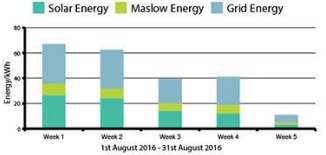
Tue Sep 13 14:12:58 2016

Here is a quick update on how your Maslow system (serial number b827eb3bea16) is saving you energy. Below are some diagrams to explain how your system is performing and the amount of energy that you have saved. The figures below are based on the data collected from your Maslow, so please note that they may differ slightly from your energy bill. We have assumed that you pay £0.14 per unit (per kWh) of electricity, which is an estimated price.

Your energy usage last month:

Your solar system generated:	246kWh	
Overall, your house consumed:	221kWh	
Of which:		
Solar Provided:	92kWh	42%
Maslow Provided:	26kWh	12%
You bought from the grid:	103kWh	47%
Total Savings last month:	£16.57	53%
So you avoided paying for:	118kWh	





Thank you very much.

Sincerely,

Alex Alexeev
Project Manager, Moixa Technology Ltd

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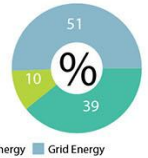
PROJECT ERIC

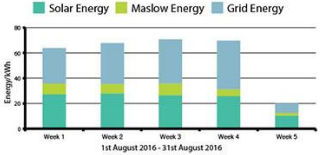
Tue Sep 13 13:17:01 2016

Here is a quick update on how your Maslow system (serial number b827ebec0b14) is saving you energy. Below are some diagrams to explain how your system is performing and the amount of energy that you have saved. The figures below are based on the data collected from your Maslow, so please note that they may differ slightly from your energy bill. We have assumed that you pay £0.14 per unit (per kWh) of electricity, which is an estimated price.

Your energy usage last month:

Your solar system generated:	218kWh	
Overall, your house consumed:	292kWh	
Of which:		
Solar Provided:	115kWh	39%
Maslow Provided:	30kWh	10%
You bought from the grid:	148kWh	51%
Total Savings last month:	£20.21	49%
So you avoided paying for:	144kWh	





Thank you very much.

Sincerely,

Alex Alexeev
Project Manager, Moixa Technology Ltd

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Groups Interface

Power flows across a group of systems

Energy shift in a arbitrary group

Stored energy
Group gauging

Power dispatch availability / directional

Dispatching | Aggregate groups | Reporting

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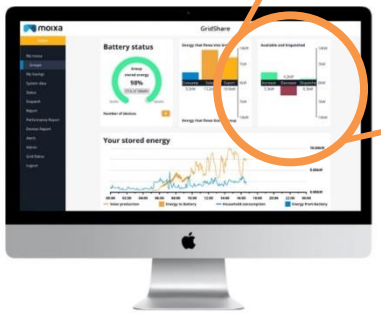
Groups Interface

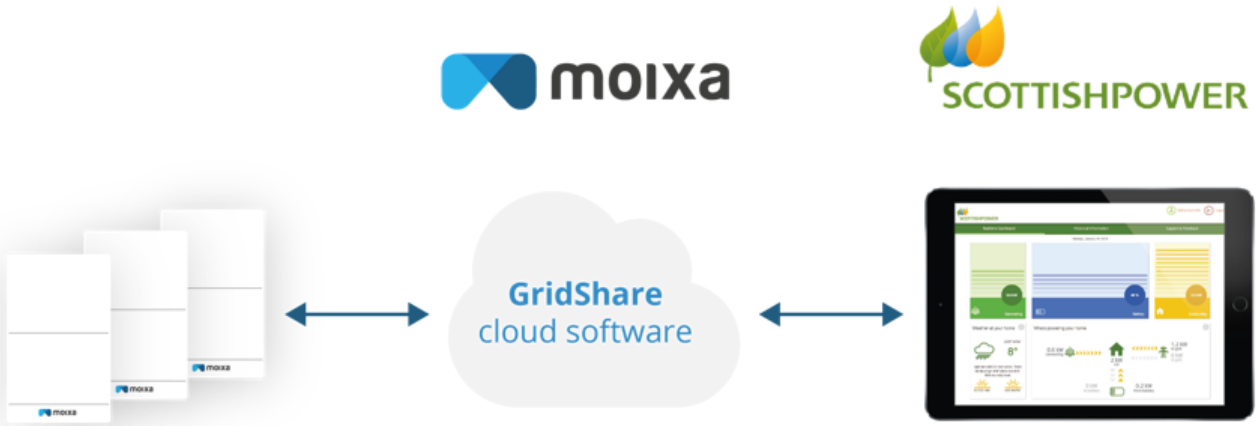


Ability of the group to increase the energy pulled from the grid

Ability to reduce consumption from the grid across the group

Case study 1: Utility, Scottish Power

Smart Battery & GridShare deployment



- 47 x Moixa Batteries

RESULT:

- Proven integration with utility control and grid feedback

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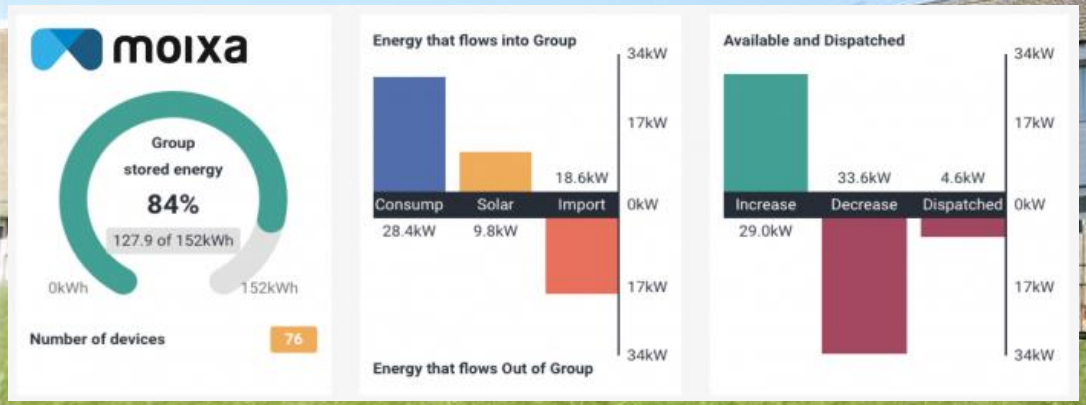
Case study 2: Social Housing, Oxford



Reducing energy costs & fuel poverty

- 90 x Moixa Batteries
- Systems deployed by Moixa with PV

RESULT:

- Proven increase in solar self-consumption and social savings
- Proven community benefit of energy sharing and tariffs
- Proven impact for strengthened local grid for SSE PD

sse British Gas OXFORD CITY COUNCIL

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Advantages of distributed storage

More homes than lakes at the top of mountains

Currently most energy storage on the grid is large-scale pumped hydro

Moixa disruptive solution: small-scale storage in millions of homes, aggregated to grid scale

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Next steps

- New finance models
- Sleeved propositions into energy tariff – single Bill
- Various trials of the above via local/communities

Powering Together

#CEconf17

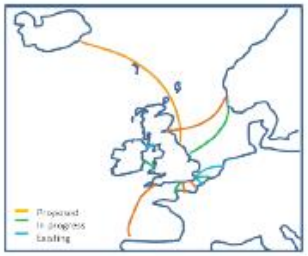
#CEF17

24th June – 9th July 2017

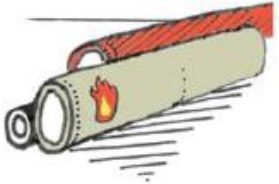
Olly Frankland

Regen

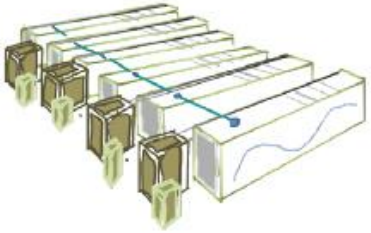
Sources of flexibility



Interconnection



Multi-vector energy integration



Energy storage

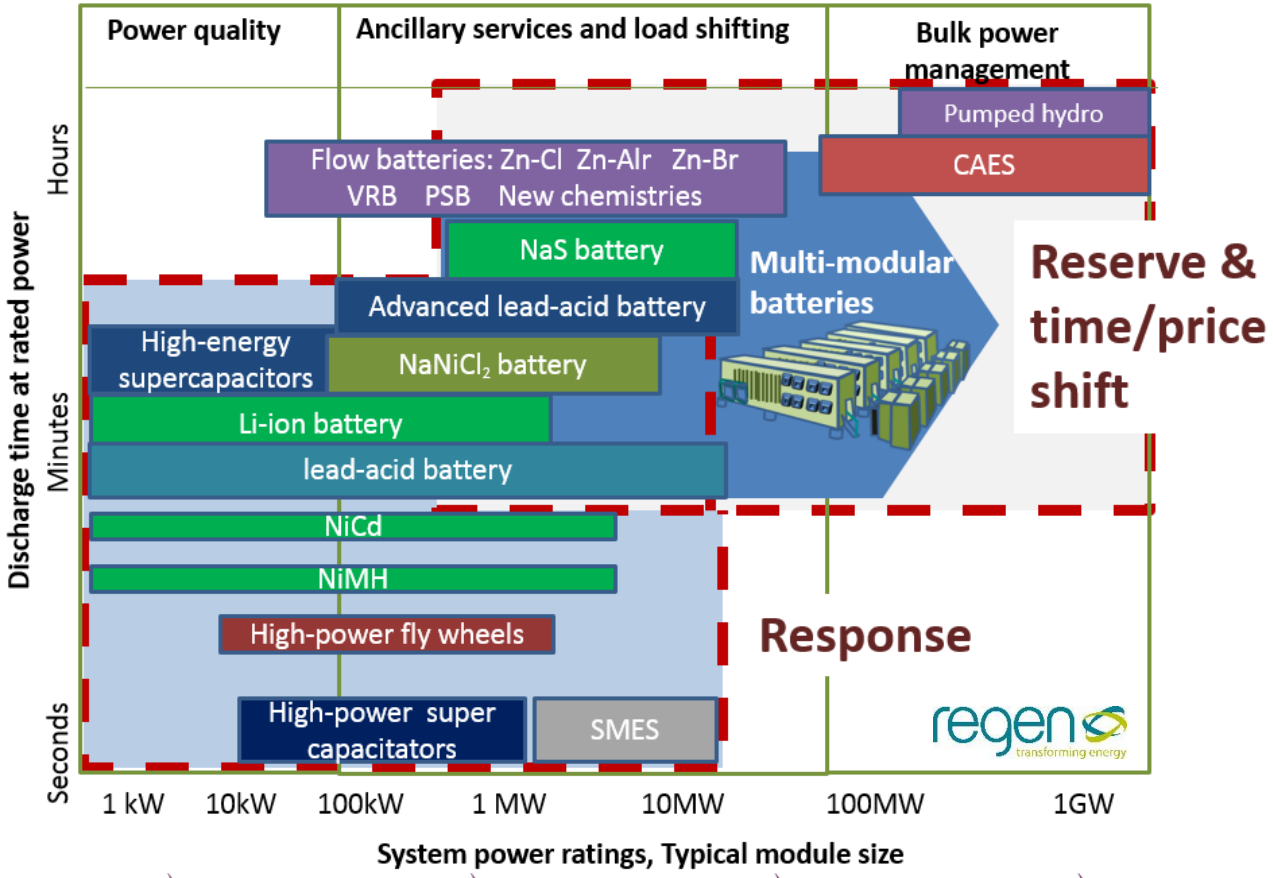
Local supply network balancing

regen
transforming energy

Demand side response

Part of The Midcounties Co-operative

Community Energy England


Power quality
Ancillary services and load shifting
Bulk power management
Pumped hydro
CAES
Flow batteries: Zn-Cl Zn-Air Zn-Br
VRB PSB New chemistries
NaS battery
Advanced lead-acid battery
Multi-modular batteries
High-energy supercapacitors
NaNiCl2 battery
Li-ion battery
lead-acid battery
Reserve & time/price shift
NiCd
NiMH
High-power fly wheels
Response
High-power super capacitators
SMES
regen
transforming energy
Hours
Minutes
Seconds
Discharge time at rated power
1 kW
10kW
100kW
1 MW
10MW
100MW
1GW
System power ratings, Typical module size

coop energy
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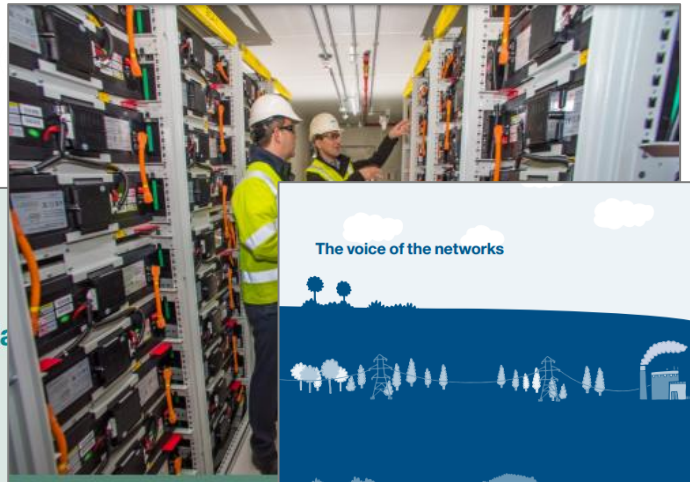
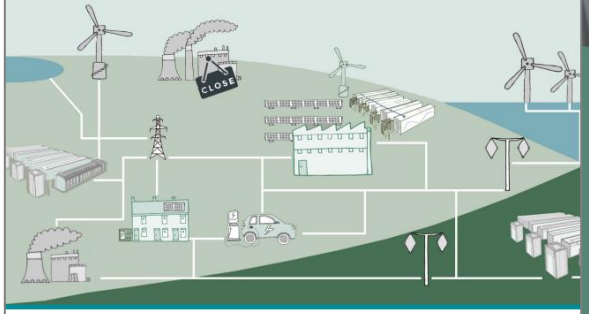


Pathways to Parity - Market insight series

Energy Storage - Towards a commercia



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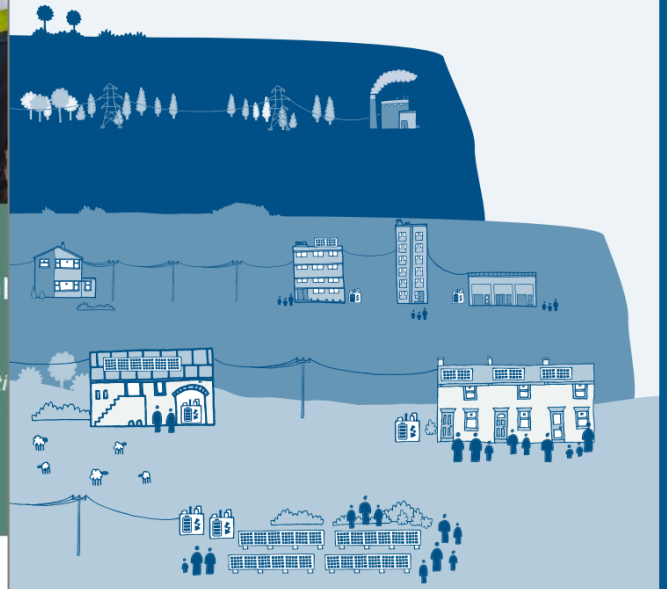
The voice of the networks



ena
energynetworks association

Energy Networks Association

Electricity storage guide for communities and independent developers

regensw
delivering sustainable energy

Q+A

Video from Western Power Distribution and Regen

link

Powering Together

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24th June – 9th July 2017