

Barnsley Utopia

P2P trading platform with low carbon locally
generated electricity

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Energise Barnsley

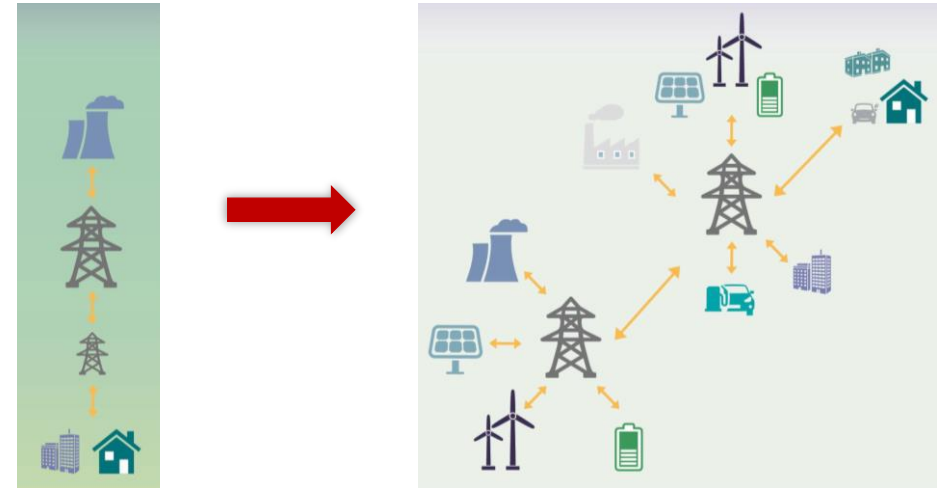
Story so far...

- Largest rooftop solar community energy & local authority project in the UK
- 321 Berneslai Homes Solar PV installation circa 900kWp & 16 Barnsley Council properties (schools & sheltered accommodation) circa 600kWp = 1.5MW rooftop solar assets
- 40 residential batteries fitted in 2017
- 7MW battery into planning 2018
- £800/- Barnsley Community Solar Bond paying 5% per annum for 5 year term
- Long term £1.2m loan facility from ethical bank 'Charity Bank' for Energise Barnsley
- Berneslai homes tenants have benefitted from over £70,000 reduced electricity bills & over 1,600 tonnes of reduced CO₂ to date
- Community Fund – 2017 <http://www.energisebarnsley.co.uk/social-impact-reports/> & 2018 cohort
- Solar PV is the start for Energise Barnsley – 2018 P2P trading & DSR for ASHP's



P2P trading

- Electricity generated centrally
- Networks were designed with a top-down approach in mind
- Distributed Generation has changed the power flow dynamics
- EB would like local distribution network to become a local trading platform
- EB believes that local low carbon electricity generation & battery storage can support demand for 70% of home electricity needs



Solar, Storage & microgrids

Ofgem Project

- 2 year NIA funded community project focusing on social housing
- £300k - batteries, monitoring & data analysis

For tenants

- Aims to reduce electricity bills
- Increase energy awareness
- Reduce reinforcement works & financial model

For Northern Powergrid

- 2030: 70-80% of rooftop PV installed with storage
- Understand impact of PV & Storage on network design
- Absorb excess generation & supply peak load



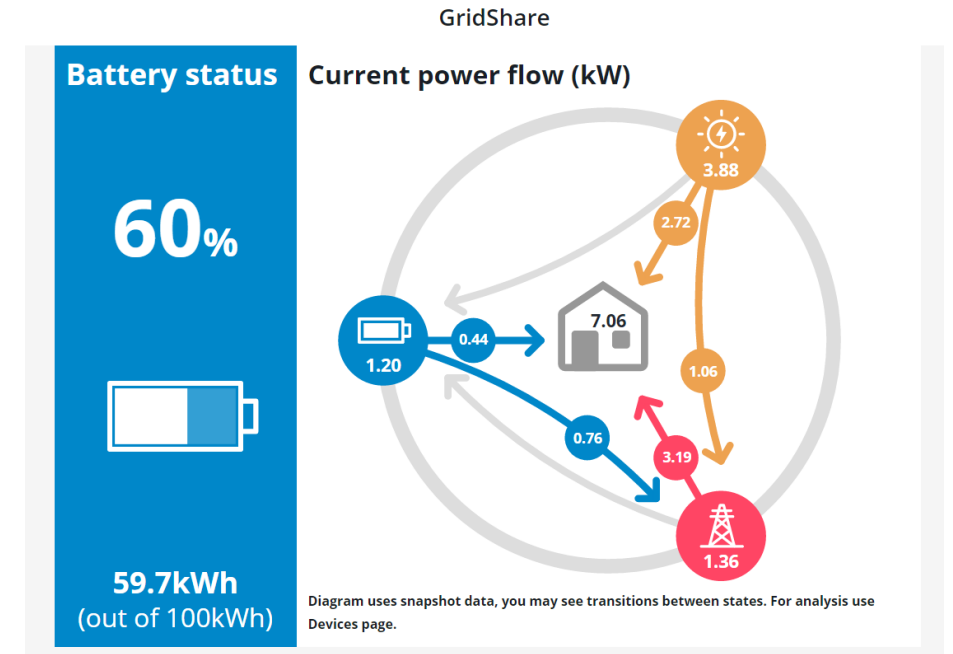
Evolution from our battery storage project



- 2015/6: 32 PVs (2.7kW - 3.68kW)
 - Connected 27
- 2017: 40 Batteries (2-3 kWh)
 - 31 paired with PVs
 - 9 on their own
- Can the rejected homes become connected/can P2P prevent green envy
- Provide customers with cheaper electricity through time shifting
- Granular analysis of generation, demand, export and energy patterns now important

Changing dynamics

- Increase capacity
- Avoid reinforcement
- Behind the meter Vs network owned batteries
- Design Policies
- Cost of PV installation fallen & improvements in metering & 3rd party platforms & prediction analysis
- Post subsidy FiT world is driving our P2P trading model



Springvale School – 22kWp

Local Substation



The Willows

Springvale School

Local Substation



**Local
Substation**





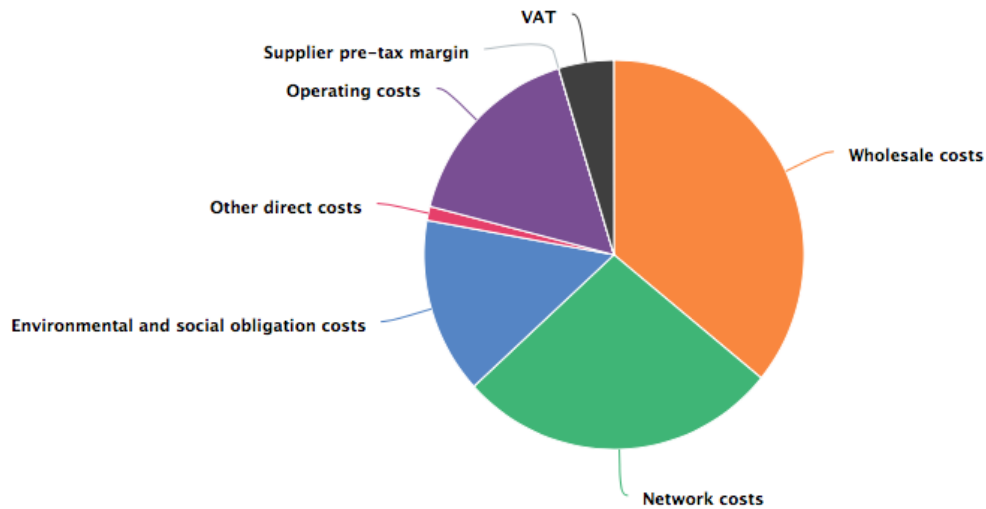
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The Willows

Electricity – your bill

Breakdown of an electricity bill



Breakdown of an electricity bill

Search:

Annual cost	Percentage
Wholesale costs	36.30%
Network costs	27.59%
Environmental and social obligation costs	14.79%
Other direct costs	1.19%
Operating costs	16.46%
Supplier pre-tax margin	-1.09%
VAT	4.76%

Date correct

August 2017



Sandbox so far...

- Ofgem have on-going P2P trials in sandbox
- Derogation but not de-regulation - have to partner with a licensed supplier
- License supply – dog eat dog world - 61 suppliers
- Sandbox team supportive
- Hustle
- Working group stakeholders – Barnsley Council, Northern Powergrid, Elexon & Energise Barnsley
- Barnsley Council – white label energy supplier, large consumer & off taker
- Northern Powergrid – ease burden on higher voltage networks as balance on local networks & consequential technical benefits
- Elexon – billing & settlement is key to unlocking local network trading – not blockchain (yet)
- 06/2018 – 06/2020 – to trial the service or model which does not fit with current regulatory arrangements



- **Objective** – EB to facilitate a trading platform for the exported solar generation from community owned solar installations to be purchased locally
- **Measure** – demand and supply through the local trading network
- **Data** – house generation, demand, export and daily profile & substation checking
- 100 households with PV & batteries in clumps to substations
- **Impact** – can we replace FiTs by monetizing local solar generation & export
- **Impact** – replace green envy & provide energy independence & hedge
- Council supplier to demonstrate the model before scaling when legislation changes
- Collaboration agreement – always open to smart ideas!

