



The role of Community Energy in a changing energy system

12.30 – 17.30, 1 June 2017 Fazeley Studios, Birmingham, B5 5SE

Agenda

This event will examine the rapid transition to decentralised and flexible energy and the opportunities for community energy groups to play a leading role, engaging their communities and developing new models in areas such as local supply and storage.

It's about finding solutions and getting inspired.

- 12.30 Registration, lunch and networking
- 13.30 **Welcome from chair**Jodie Giles, senior project manager communities, Regen
- 13.45 Adapting to policy changes and engaging with government Robert Rabinowitz, director, Community Energy England
- 14.00 The changing electricity network: the transformation from DNO to DSO, innovation and opportunities for community groups

Alison Sleightholm, regulation manager, Western Power Distribution

Q&A

- 14.45 Refreshment break and networking
- 15.15 New community energy business models: local supply and storage Tim Crook, senior project manager, Regen
- 15.45 **Creating, Catalysing, Collaborating. Saving Lives and More with Solar**Anthony Walters, Chase Community Solar and South Staffordshire Community Energy
- 16.15 **Q&A**
- 17.00 Networking drinks
- 17.30 **Close**













Chocolate brownies and community energy in a changing energy system – 01.06.2017

Entering through a huge sky-blue door on a noisy industrial estate, we arrived at the tranquil Fazeley Studios in Birmingham, a stark contrast from the outside world. Over thirty people joined us here today to chat about the role of community energy in a changing energy system. Fuelled by lunch and chocolate brownies we got down to business. First up was a quick introduction to an incredible array of community groups, people from universities, welsh government, and distribution network operators (DNO). This first rule of a great event is to get the right people in a room - tick!

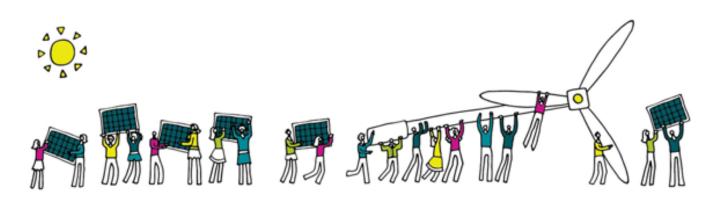
The community groups proved their metal by talking about the projects they've installed, lots of solar, and the innovative projects they are planning and delivering including lots of storage, power sharing, energy efficiency and biomass (using miscanthus).



1. The government

First up, I gave the group a quick run through of what's going on with policy. This included a political manifestos league table of climate change and community energy content. Now is a great time to influence and engage MP's and candidates; you can have a lot of impact with relatively little effort and you can use the Regen toolkit and templates to do this. Community Energy England (CEE) and 10:10 will be launching a pack to help engage MP's after the election with a useful wish list of what we should be asking our politicians for. This includes:

- supportive financial mechanisms
- giving community ownership material weight in planning policy
- full and fair access to the energy market for local supply







CEE will be launching their State of the Sector survey at the conference on the 24 June and using this to influence policy. The conference is the start of Community energy fortnight (24 June – 9 July) and the Climate Coalition's week of action (1-9 July). These are great opportunities for community energy groups to run events and engage MP's.

Can we rely on politicians to sort out our energy market? I won't be holding my breath, but we've seen the impact policy can have on our projects, and so it's essential we keep highlighting the great work community energy groups are doing alongside our politicians. The consensus in the room was that community energy groups can act as trusted intermediaries, effecting behaviour change and helping with education. However, our real strength comes from getting on with making great projects happen, regardless of what happens in Westminster.

2. The electricity network

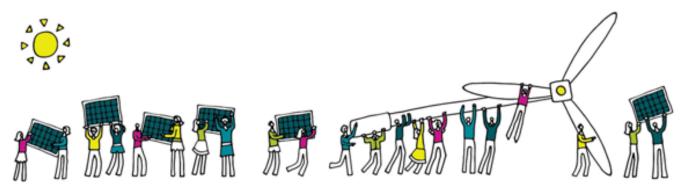
Next up we heard from Alison Sleightholm at Western Power Distribution (WPD) who rides a motorbike and wears killer heels. Aside from that, in her day job she helps keep the lights on for 7.8 million customers in WPD's licence area. Alison expertly guided us through the transformation from Distribution Network Operator (DNO) to Distribution Systems Operator (DSO), the innovation projects they are delivering, and opportunities for community groups. The impact of distributed generation and storage means WPD are having to manage the network in a much more proactive way.

In the future WPD will be managing energy rather than power, demand response contracts, local balancing & settlement, alternative connections, and will have more commercial interaction with customers. They will be rolling out active network management (ANM) to their entire licence area by 2021, demonstrating their ambition to continue leading the pack of network operators. WPD have also been busy making information for communities more readily available on their website with films, guides and tools to help groups get connected and find innovative solutions for their projects. Alison's sage advice to communities included to "be fearless, the rules don't exist yet" and "conversations are free" so chat to your DNO early.

3. The models

Olly from Regen gave us to low down on the latest new storage and local supply models for community energy. Olly took part in the world gig pilot championships a few years ago and came 56th in the world.

The landscape is changing really quickly in the local supply and energy storage worlds. It's tough for the community energy sector and everyone else to keep up. Regen is working on new projects with three community energy groups to understand how these new business models could work - with support from Friends Provident Foundation. We will be sharing the knowledge with our network in the Autumn.







We've also been doing some work for Cornwall Council, and have identified two leading models of local supply, the energy local club and licence exempt private network (microgrid). The Energy Local example is showing particular promise, with five additional projects following on from their successful trial in Bethesda, Wales.

- Local supply animation
- Local supply: Options for selling your energy locally



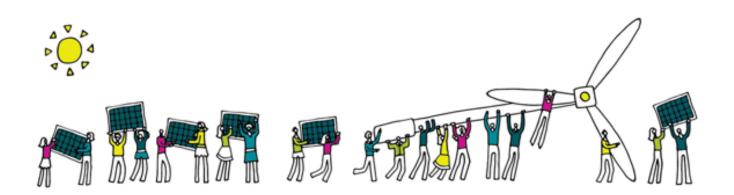
Energy storage is getting huge levels of attention, but it's a very different proposition from the traditional solar PV community model. The income streams are much more uncertain and often need to be 'stacked' to make a business model work. Regulation is lagging behind the market and the warranties/lifetime of products can be a minefield. This all makes energy storage much riskier than PV, and communities need to treat it with cautious optimism. Because battery costs keep falling, and time of use tariffs and aggregation platforms are becoming more accessible, the situation changes rapidly and it's one to keep an eye on.

Energy storage – key points communities

Energy Storage - Towards a Commercial Model 2nd edition

Electricity storage guide for communities and independent developers

WPD energy storage consultation







4. The front line

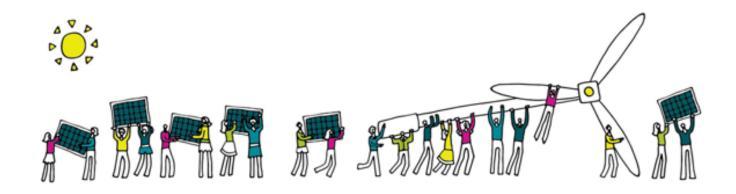
Our final speaker, Anthony Walters from South Staffordshire Community Energy (SSCE) and Chase Community Solar talked about the incredible work his group is doing. It was a masterclass in demonstrating impact to draw in further funding and partners, creating "matches made in heaven". Anthony talked about how SSCE have installed solar panels on 8 of their local hospital buildings and they wanted the community fund to have substantial impact, rather than giving away a few LED light bulbs. They are working with the hospital and a charity called Beat the Cold to tackle the 167 excess annual winter deaths in Stoke and keep the "frequent fliers" out of A&E. These are people who repeatedly return to A&E with cold related respiratory diseases due to poor housing and poverty. There are 1187 frequent fliers who cost the NHS £4.5 million a year in this trust alone. A home visit from Beat the Cold costs £120. Tracing a person through the healthcare system has enabled SSCE to demonstrate the impact of the solar community fund, and how much money that have saved the taxpayer. This has encouraged the big six vulnerable customer teams and the council to get on board and support them.

Anthony's ambition now is to help his local authority create a truly equitable Stoke energy market "Potteries Power". His drive and determination to continue moving the community energy revolution forward is evident, but to do this we must be more strategic and collaborative. He offered up some golden nuggets of advice and left us all feeling truly inspired and motivated to have more fun! Anthony once took 40 tonnes of chocolate down the Amazon.



We topped it all off in a sunny courtyard garden with some great wine fuelled networking and yet more chocolate brownies.

If you'd like to join us for more fun events like this one, keep an eye on the Regen events page on our website.





A New Model of Collaborative Community Benefit

University Hospitals of North Midlands MIS



NHS Trust





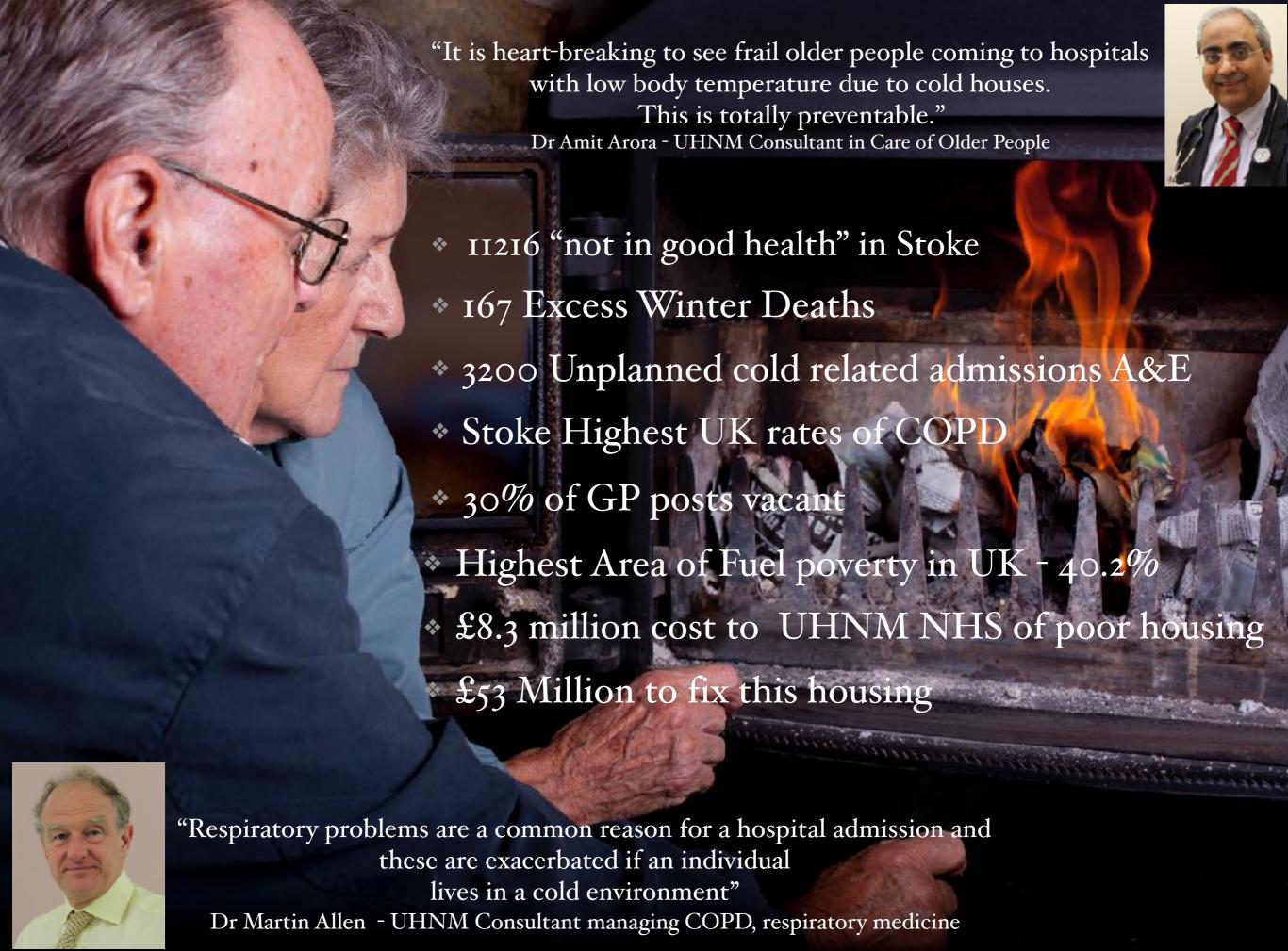




Saving Lives with Solar

- * The UHNM NHS trust approached SSCE September 2015
- * NHS invested +£15000 in EPCs
- * 480kwp registered pre FIT reduction deadline
- * Financial Modelling
- * 283kwp 8 buildings
- * UREF
- * PPA
- * Roof Lease negotiation February August 2016
- Loan negotiated with Pure Leapfrog
- * Share Raise- 25/7/2016- 25/9/2016
- Community Fund with impact





<u>UHNM Stoke A&E</u> +65 YEAR OLDS

- * 15240 Ambulance calls
- * 6900 to A&E
- * 3100 Admitted
- * 1187 "Frequent Fliers" cold related and respiratory diseases



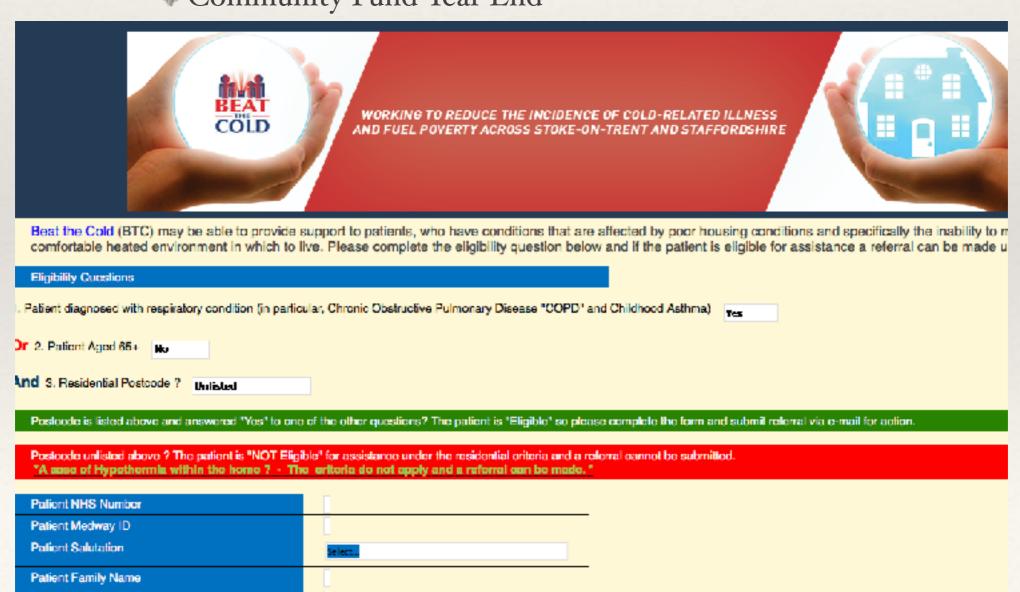
£4.5 Million





Progress to Date

- NEA Prize Pilot
- Process built with A&E Consultants & Staff
- Training/ retraining / trust build
- Support British Gas/ EON/ CCG/ Stoke City Council
- 57 Referrals
- Full data support ex UHNM
- Primary Care interest and support
- Community Fund Year End



Community of Interest & Community of Place



COMMUNITY OF INTEREST & COMMUNITY OF PLACE

DEMOCRATIZATION

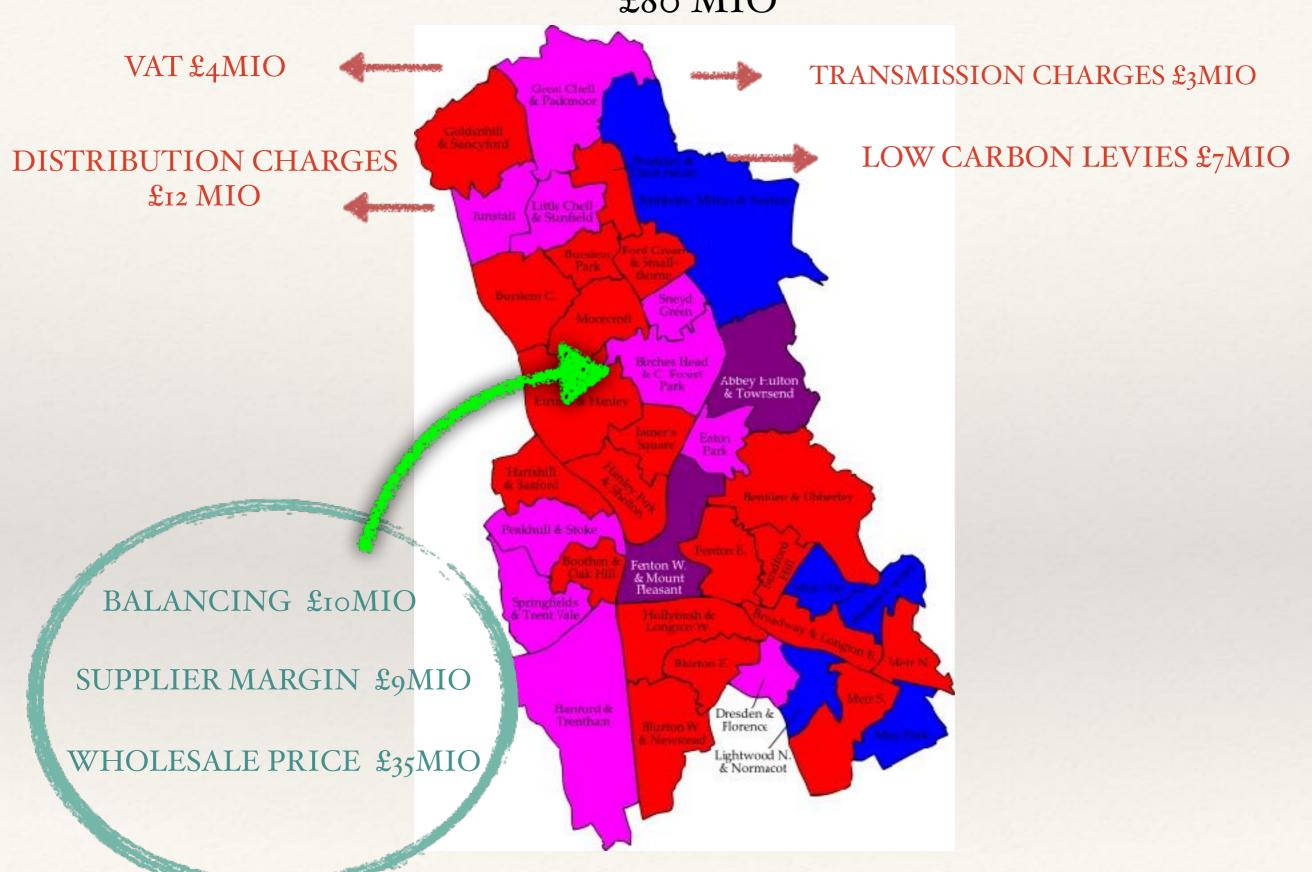
DECENTRALISATION



DIGITALISATION

DECARBONISATION

STOKE ELECTRICITY MARKET \$80 MIO



COMMUNITY OF PLACE & INTEREST

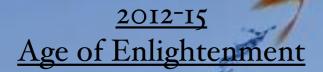
POTTERIES POWER

- * Geothermal District Heating
- * Large Inner City Brownfield Solar PV/Storage
- * PV on Terrace Roofs with Power Share Tech
- Prudential/Social Lending
- * Panel Lifetime Depreciation
- * Community Shares
- * 7-9p kWh Production Cost
- * Consumer discount min 30%
- * Local Residents Customer Care- Rewarded
- * £ Value Recognition of Health and Wellbeing Benefits



Community Energy Groups

Life can be understood backward, but it must be lived forwards



Well Fed Driven by deadline

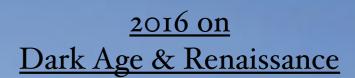
Community small c

Monotech

Burn out

Passive Partners

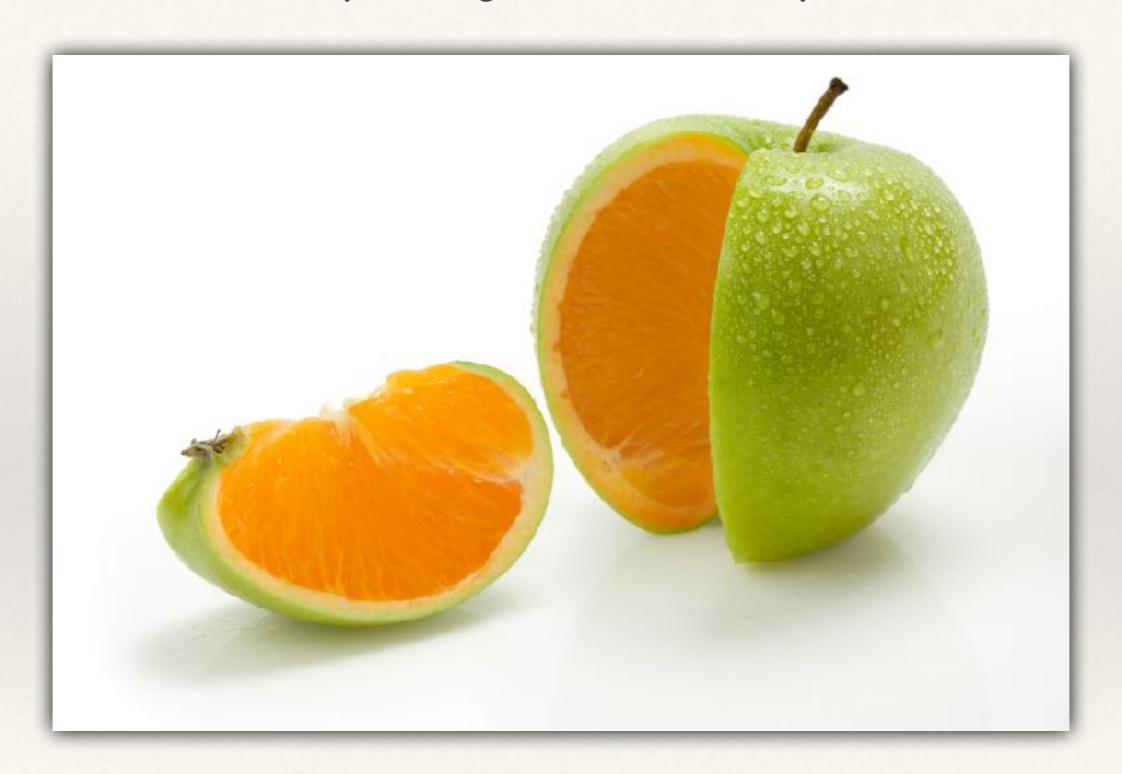
Ego



Lean- seed & project funding
Proof of efficacy of previous work

Strategic /Long Term
Community Benefit at core
Collaborative Partnership
Clear roles & responsibilities/skills
Recruit & Reward
Multi Tech
Fun

Imagine what you Desire ..
Will what you Imagine...Create What you Will.



Thank You



Storage & local supply - the community energy perspective

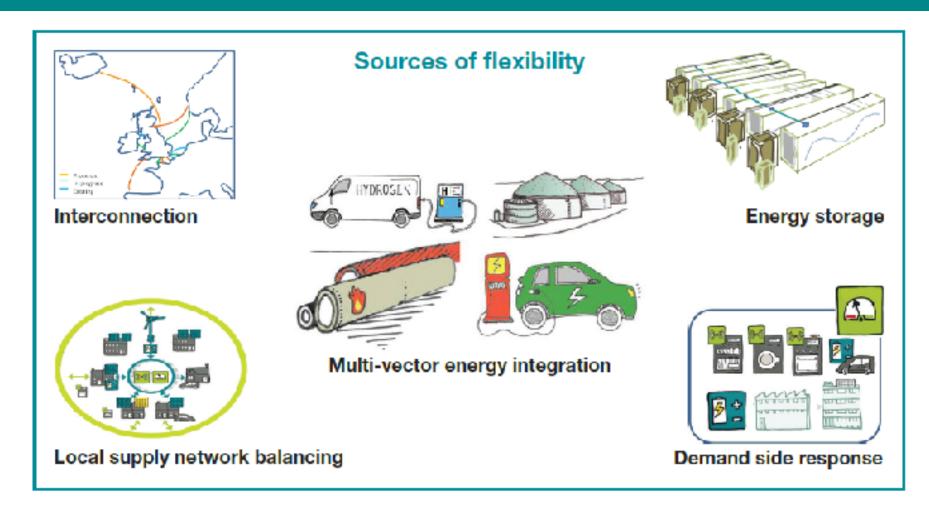
1 June, March 2017

Olly Frankland, project manager, Regen



Flexibility



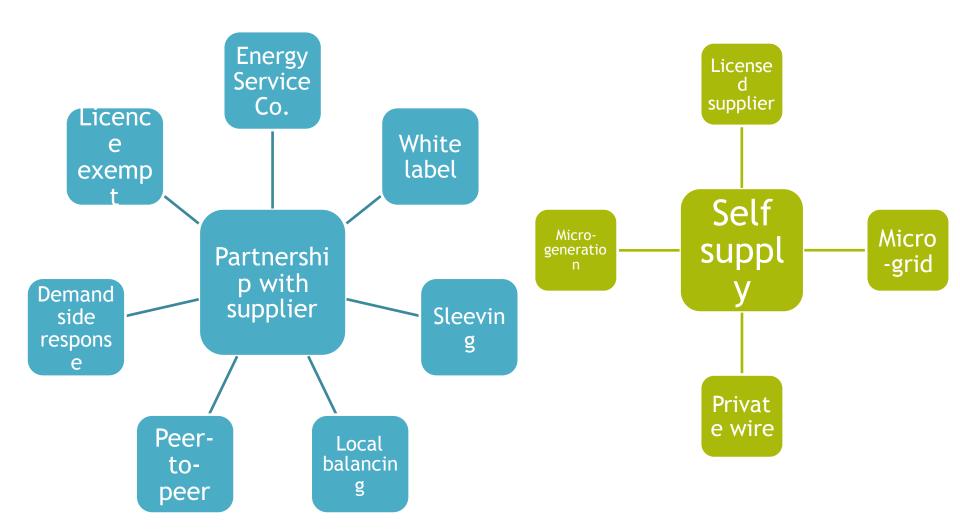


'The saving could be as large as £8 billion a year by 2030.' Lord Andrew Adonis, Chair, The National Infrastructure Commission

1. Local Supply models

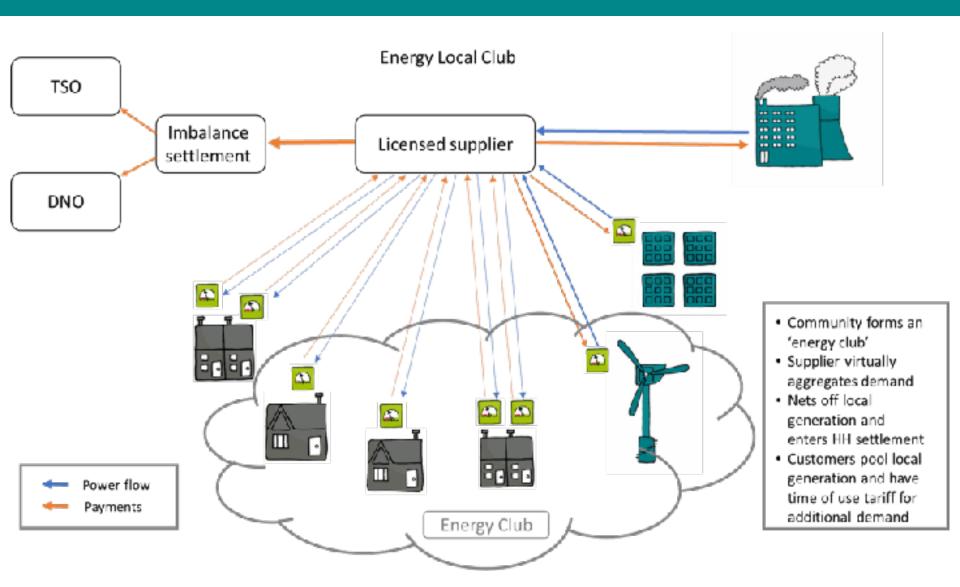


Local supply = the supply of locally generated <u>electricity</u> to a local group, for the benefit of local <u>domestic</u> consumers



Energy Local Club





Energy Local Club



Benefits:

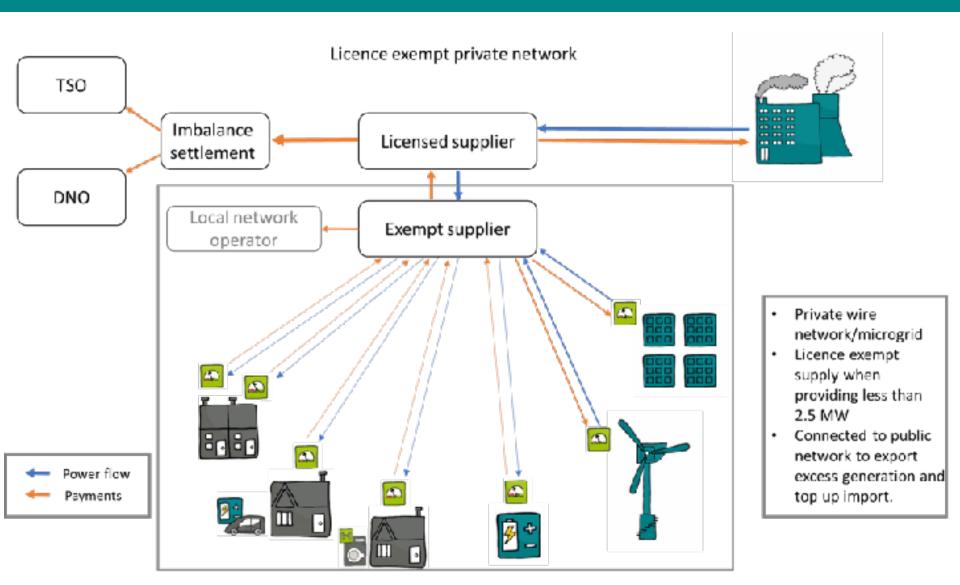
- Closer link between local generation and demand
- Good value flow to consumers

Drawbacks:

- Hard to switch customers
- Energy supplier needs to be amenable
- "Smart" metering

Case study - Energy Local, have linked 100 households in Bethesda, Wales with a National Trust hydro turbine

Licence exempt private network (microgrift) General Company Co



Licence exempt private network (microgrift) GENSON CONTROL OF THE CONTROL OF THE

Benefits:

- No need for supply licence
- Solution for subsidy free generation

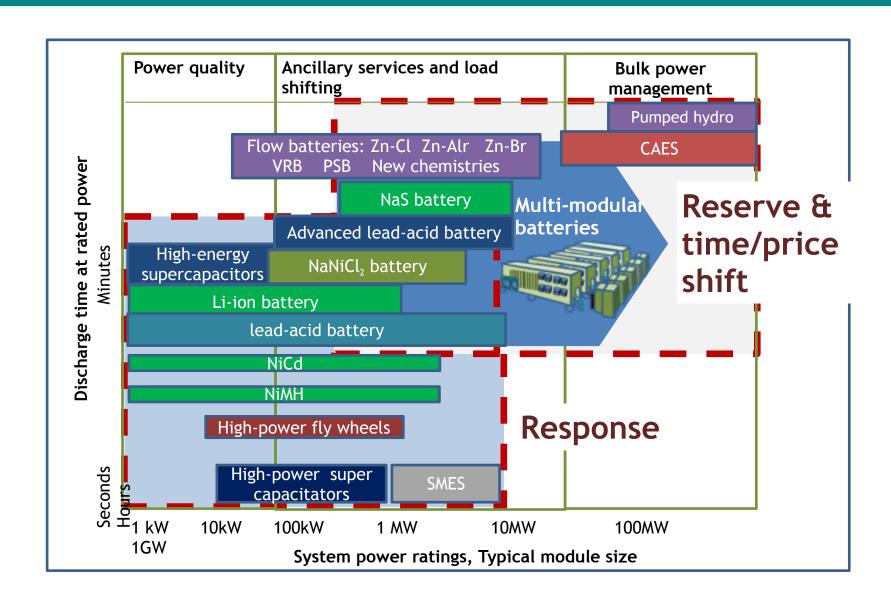
Drawbacks:

- Hard to find the right customer to guarantee demand
- Large upfront capital investment

Case study - Thameswey, has a private wire network in Milton Keynes providing power to businesses and households

2. Energy storage technologies





The role of energy storage



Inherent value of energy storage

Response

"ability to respond quickly to grid or price signals"

Frequency response

Reactive power and voltage

Other ancillary services



Reserve

"ability to store and discharge energy when needed"

Back-up

Operating reserve

Capacity reserve



Price / time shift

"ability to shift energy from lower to higher damand and price periods"

Price arbitrage

Peak shaving

Grid peak price avoidance

Aggregation



Which revenues for which assets?



	Main Revenue Streams	Target Incentive Programmes / Benefits
1. Response service	Frequency & voltage programmes	Enhanced Frequency Response (EFR) Firm Frequency Response (FFR) Enhanced Reactive Power Services (ERPS)
2. Reserve service	Capacity & reserve contracts	Short Term Operating Reserve (STOR) Fast Reserve Capacity Market
3. C&I high energy behind the meter 'prosumers'	Network charges & capacity contracts	Transmission peak charges (Triads) Distribution peak charges (DUoS red band) Demand Turn-up
4. Domestic and community 'own-use'	Optimising self- usage of on site generation	Future Time of Use Tariffs (ToUTs)? Community scale aggregation into FFR/ STOR?
5. Generation co-location	Time & Price Shift	Avoiding export restrictions (Time-Shift) Diverting generation into high price zones Capacity Market

Potential "waves" of deploymentegening energy

Wave 1

Response Services (EFR, FFR & DSR)

First "behind the meter" high energy users

Plus domestic "early adopters"

Wave 2

"Behind the meter" industrial - DSR

RE co-location - especially for new PV

Some standalone sites

Domestic and community storage with PV

Wave 3

Aggregation and marketplace models

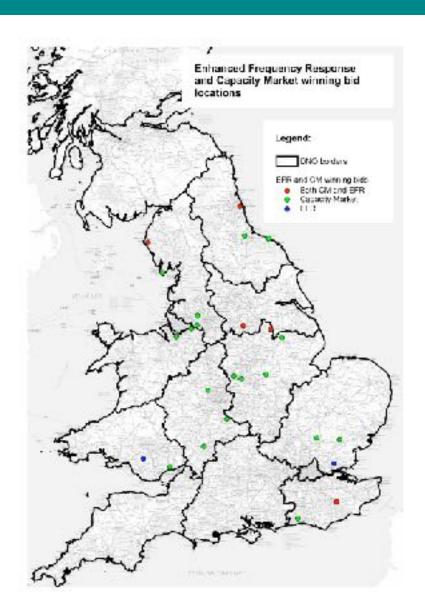
RE co-location

Domestic and community storage becomes standard

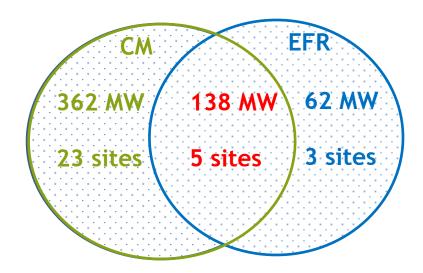
Today Tomorrow The day after!

Current pipeline cont.









Total EFR and CM Winners
562 MW
31 Sites

^{*} National Grid reports a lower figure @ 62 sites which could well be right

Potential scale of the storage markeftegensis energy

GB market scenario growth scenario by 2030*			
Business model	High Growth Scenario	Slower and no growth Scenario	Possible upside very high growth scenario
Response service	2 GW	0.5 - 1 GW	2 - 3 GW
	2 GWh	0.5 - 1 GWh	4 - 5 GWh
Reserve Services*	3-4 GW	2-3 GW	4 GW
C&I high energy user & behind the meter	2.5 - 4 GW	0.6 - 1.2 GW	5 GW
	10 - 16 GWh	2.5 - 5 GWh	20 GWh
Domestic and community own use with PV***	1.5 - 2 GW	0.37 - 0.75 GW	3 GW
	6 - 8 GWh	1.2 - 3 GWh	12 GWh
Generation co-location	2 GW	0.5 - 1GW	4 GW
	6 8_GWh	2-4 GWh	16_GWh
Total GB market	10 - 12 GW	4 - 5 GW	15 GW**
	24 - 44 GWh	6 - 13 GWh	50 GWh

^{*} includes existing 2.7 GW of storage - mainly pumped hydro reserve services

^{**} A very high growth scenario for all business models would probably imply some degree of revenue cannibalisation between business models and is therefore less likely by 2030.

^{***} Would include EV vehicle-to-house storage discharge although this has not been modelled separately

Key points for communities



- The income is less certain
- Lithium-ion batteries are dominant
- Costs are coming down rapidly
- Warranties and lifetime vary
- Regulation is lagging behind the market
- There is a risk of mis-selling

Summing up...

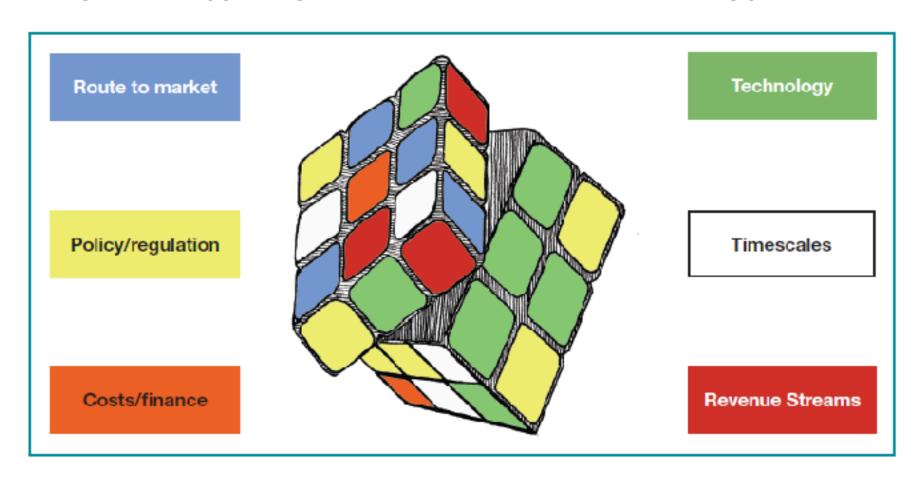


Domestic (10's kWh)	Small commercial (100's kWh)
Mainly new solar PV + battery installations due to lower rate of VAT (5%)	Behind-the-meter high energy user (with generation)
Innovators/early adopters - non- financial drivers Cost and lack of awareness main barriers	Early adopters with financial case possible - mainly through network cost reduction Changes to DNuOS in SW undermine model Cost and lack of finance main
	barriers

Summing up...

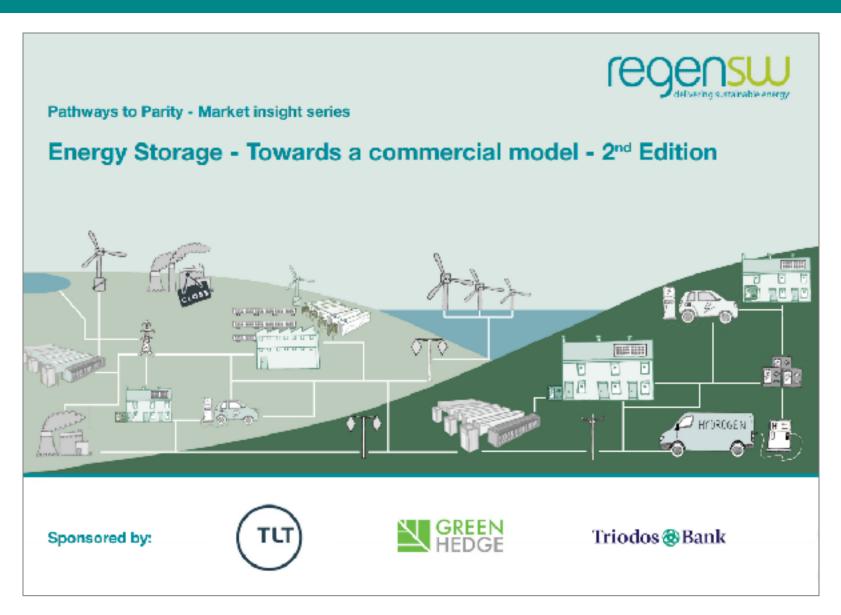


There is significant interest in storage across the energy sector Progress is happening, but there are still a lot of moving parts...



Energy Storage - Towards a Commercial Model

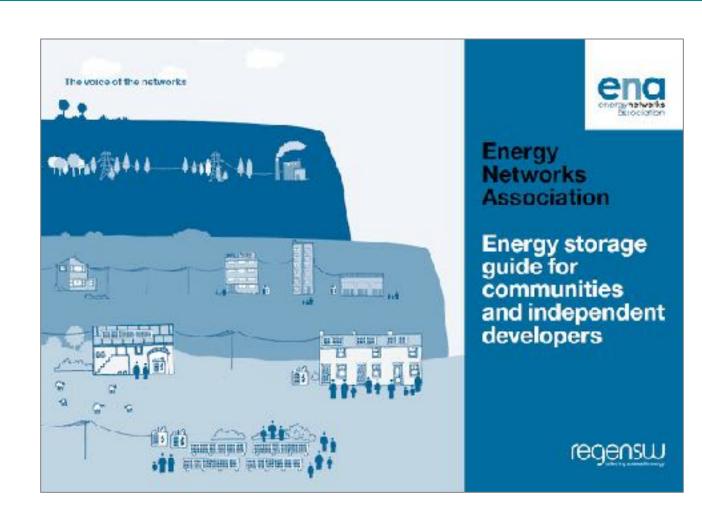




ENA storage guide



- Introduction to area of energy storage and ways to connect to the network
- For community energy groups and smaller independent developers



WPD consultation paper



In undertaking this consultation, WPD is seeking to understand:

- scale of growth
- type of energy storage assets/ projects
- operating behaviour of storage assets

Contact:
Ray Arrell
Senior project manager
rarrel@regensw.co.uk



Energy Storage Growth Scenarios and Operating Modes

Consultation to assist future network modelling



Questions



Generic storage operating modes



Operating Mode	Summary Definition
i) Network Auxiliary services only	Operating under direct contracted response services such as frequency, Voltage / Reactive Power. This mode is for battery systems that are dedicated to being available for these response programmes 24hrs a day
ii) Network Auxiliary services + Network Peak	As above, but carving out a small window of operation (2-4hrs) to discharge in peak network charge + commodity price periods.
iii) Reserve service standby only	Operating mode reflecting operation under balancing service contracts, effectively operating to be available for STOR, Fast Reserve, CM etc idle operation awaiting triggers/alerts
iv) Reserve service + Network Peak	Operating under balancing services contracts as above, but also carving out a window of operation to discharge during peak network charge + commodity price periods
v) Network Peak Charge Avoider Only	A mode of operation designed predominantly for behind the meter classes of project, whereby a battery system has been implemented to supply a demand load during network peak charges. Battery charging is during lowest price periods.
vi) Cost Sensitive Self- consumption	A mode where a demand user with generation is maximising self-consumption, but discharging during high commodity/delivery charge periods. This could currently be a C&I user with generation, subject to cost sensitivity or smaller users with Time of use Tariffs
vii) Max Self-Use	A mode where the maximisation of self-usage is not sensitive to high/low price thresholds (i.e. domestic solar with a flat electricity import tariff). Charging when solar is generating, discharge when energy is needed.
viii) Generation Peak Shaving	Mode of operation where storage is co-located with a stand alone generation, diverting proportion of generation into storage, so as to bypass grid export limitations. Likely to also discharge during network peak.
ix) Generation Time & Price Shift	Mode as above, but whereby there is no grid export limitation restriction and the colocated storage is simply shifting the time of some exported volume into more beneficial times - i.e. evening network peak

Standard Storage operating modes



Response service

Response service

High energy user "behind the meter"

Domestic and community "own use" with PV

Generation co-location

Energy trader

Automatic triggered (±) power response

Peaking reserve on call for STOR and Fast reserve

Peak demand shaving (with generation time shift)

Maximise Own
Consumption - usage
optimisation

Peak generation shaving

Price Arbitrage

with winter peak
TRIAD discharge
window

with winter peak TRIAD discharge window

With peak (TRIAD/Red Zone) discharge

Minimise Energy Cost with price optimisation

or

Revenue optimisation

Storage growth factors



Wave 1 - led by response services

- Storage dominates the EFR, FFR, DSR and new voltage support services
- Higher value services drive market growth with focus on MW and response time
- First applications for high energy industrial and commercial users behind the meter models
- Domestic and community scale early adopters
- Development of a DSO distribution network model creates new market opportunities
- Government creates framework for a flexible and smart energy system

Wave 2 - co-location business models become viable

- Market for C&I high energy user/generators grows rapidly
- Emission controls and an attractive business case mean that storage effectively replaces diesel generators for most C&I application
- First co-location projects with solar PV lead to a rapid expansion and new ground mounted solar PV farms are developed
- Domestic and community scale storage market expands rapidly driven by falling costs

Wave 3 - expansion and new market models

- Aggregation and new trading platforms develop
- Local supply markets, private wire and virtual markets rely heavily on electricity storage
- Domestic electricity storage becomes common as costs fall and electric vehicle purchases increase, alongside growth in the electrification of heat
- Most new solar and wind farms now include electricity storage to harness low marginal cost energy and price arbitrage

Agenda

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Distribution

ABQ

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Anthony Walters, Chase Community Solar & WESTERI



Serving the Midlands, South West and Wales

CE

16.15 Q&A

17.00 Networking d













The role of Community Energy in a changing energy system

Birmingham, 1 June 2017













Regen



Projects

Membership

Events

www.regensw.co.uk



Agenda

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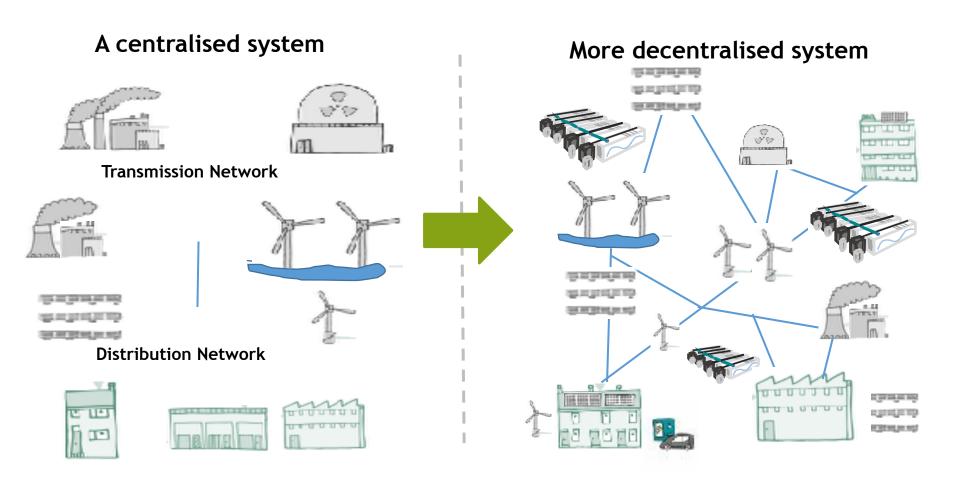








Our energy system is changing ...





Community energy groups are adapting

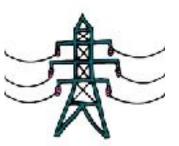


How to get involved in energy network innovation

- Build your networks so you have a strong offer
- Network and develop partnerships with your DNO and licensed suppliers, smart tech and developers
- Most trials funded by the Network Innovation Allowance (NIA) or Network Innovation Competition (NIC), Innovate UK, The Energy Systems Catapult, or universities.











Make use of great resources available



Connections

Basic pricing tool

New connections

Competition in connections

Generation

- Senerator application / commissioning forms
- >Installation
- > Distributed generation EHV

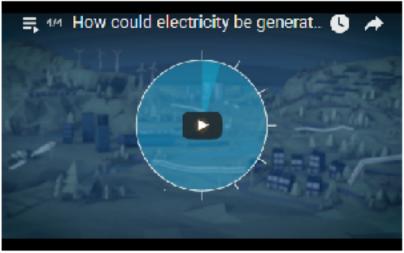
Guides and Information



Alternative Connections



Local Supply



https://www.westernpower.co.uk/ Connections/Generation/Community-Energy.aspx

Adapting to policy changes











Department for Business, Energy & Industrial Strategy









What about our interconnectors?



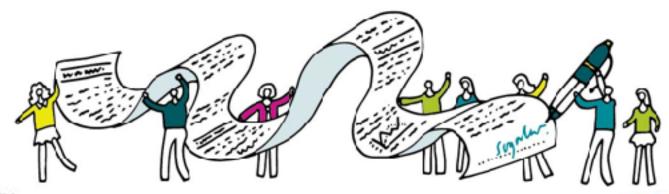


Key policy drivers

- Industrial strategy "Fair inclusive economy"
- Smart flexible energy system

http://communityenergyengland.org/wp-content/uploads/2017/01/Smart-Flexible-Energy-Systems-Call_Response-by-CEE-and-CEW.pdf

- Clean growth plan delayed
- Clean air act delayed environmental lobby
- Trusted intermediaries behaviour change, education..





Party manifestos

	Conservatives			Labour			Liberal Democrats	Green Party		
Climate		Take a lead in global action against climate change An independent review to ensure UK energy costs are as low as possible.			Put us back on track to meet the targets in the Climate Change Act and the Paris Agreement.		Support the Paris agreement Pass five green laws: a Green Transport Act, a Zero-Carbon Britain Act, a Nature Act, a Green Buildings Act, and a Zero-Waste Act.		Breathe life back into the Climate Change Act by investing in an energy system fit for the 21st century.	
Community		Not mentioned.		•	Publidy owned, locally accountable energy companies and co-operatives		Expand community energy schemes		 Priority access to the grid Toolkit Create projects in every town and city 	

Carbon Brief guide



Pre election toolkit

Find your MP here template email to send to your local candidates A list of key asks for best results

- 1. Put local communities at the heart of our energy system
- 2. Recommit to Climate Change Act and regular carbon budgets and issue the delayed 'Green Growth Plan'
- 3. Commit to ensuring there is a price on carbon
- Publish a roadmap to a smarter decentralised energy system that enables balancing supply and demand at a local level

Engaging government post election

- lobbying pack on 9th June CEE and 10:10
- CEE launching the State of the Sector survey 24th
 June
- Community energy fortnight 24 June 9 July
- Climate Coalition's week of action 1-9 July
- An opportunity to run events and engage your MP's

Key asks

- supportive financial mechanisms
- Planning give community ownership material
 Woight
- community and fair access to the energy market for local ly

Upcoming events

Delivering a Smart Energy System

Claverton Down, Bath 4 July 2017 0930 - 1730

Post-election Prospects for Energy Policy, Members' Forum

Two Glass Wharf, Bristol 12 July 2017 1500 - 1830

EWiRE A smart, decentralised system

TLT, London 4 October 2017 1400 - 1730

Renewable Futures and Green Energy Awards

Assembly Rooms, Bath 28 November



Further information from Regen

- Energy Storage -Towards a Commercial Model 2nd edition
- Network charging for flexible future
- Report on the future of distribution networks
- Local Supply
- Rough Guide to
 Engaging Communities
 in Energy Network
 Innovation
- Guide to connecting storage for communities









Contact us

We're always keen to hear from you. Call us, email or pop in for a cup of tea...













Jodie Giles Senior Project Manager jgiles@regensw.co.uk





regensw.co.uk/communities

Agenda

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- 13.45 Adapting to policy changes and engaging with government Jodie Giles, senior project manager communities, Regen
- 14.00 The changing electricity network: the transformation from DNO to DSO, innovation and opportunities for community groups

Alison Sleightholm, regulation manager, Western Power

Distribution

ABQ

- 14.45 Refreshment break and networking
- 15.15 New community energy business models: local supply and storage

Olly Frankland, senior project manager, Regen

15.45 Creating, Catalysing, Collaborating. Saving lives and more with solar

Anthony Walters, Chase Community Solar & WESTERI



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16.15 Q&A

17.00 Networking d













