Energy Local

local energy markets and flexibility – what we can do for you (with a bit of help from you!)

Our Vision

See the establishment of thousands of local, not-for-profit, Energy Local Clubs (ELCs) that allow local renewable generation to be used locally.

Benefitting communities and local renewables networks and the national system.

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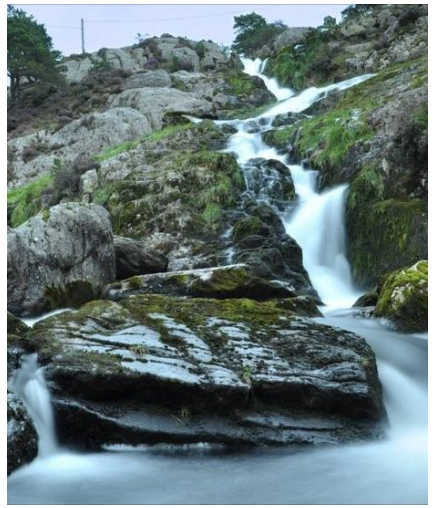
What we do - An Example….

- Local hydro Arfon Berthen near Bethesda is sold for ~14p/kWh and residents still pay up to 27p/kWh.
- Participants and the hydro form an Energy Local Club.
- The supplier will install smart meters which show when power is used as well as how much. Club members can show how much they are using when the hydro is generating.
- Members will agree the price for the local hydro they use when it is generating, e.g. 20p/kWh.
- Households get cheaper power and the hydro plant receives a higher income – more money for the community.



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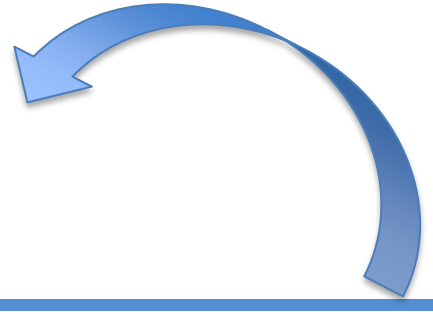
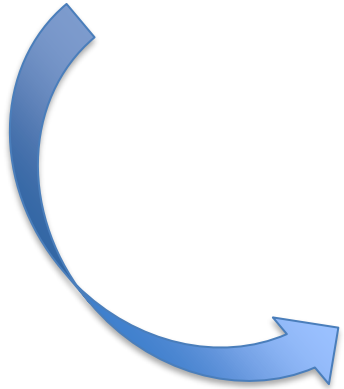
Network Benefits of the Model – virtuous circles

Matching demand to generation

- reduces network constraints
- Allows more generation to connect
- Provides means to develop district heating networks, this reduces strain of the electricity network.



- Retention of wealth within the local economy
- Direct action on fuel poverty
- Will enable investment in new, local generation
- Degree of shelter from global energy prices
- Supports action on energy efficiency
- Supports local economy



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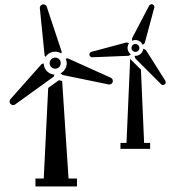
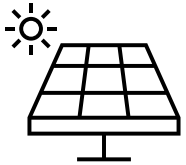
‘Flexibility for Free’

- Encouraging using local generation and shifting from 4-8 balances the network.
- Change behaviour before there is a problem!
- Seen a shift in peak loading to 7.30-8pm and matching local generation.
- Local energy markets can make district heating viable – takes all the demand for heat pumps off the LV feeders





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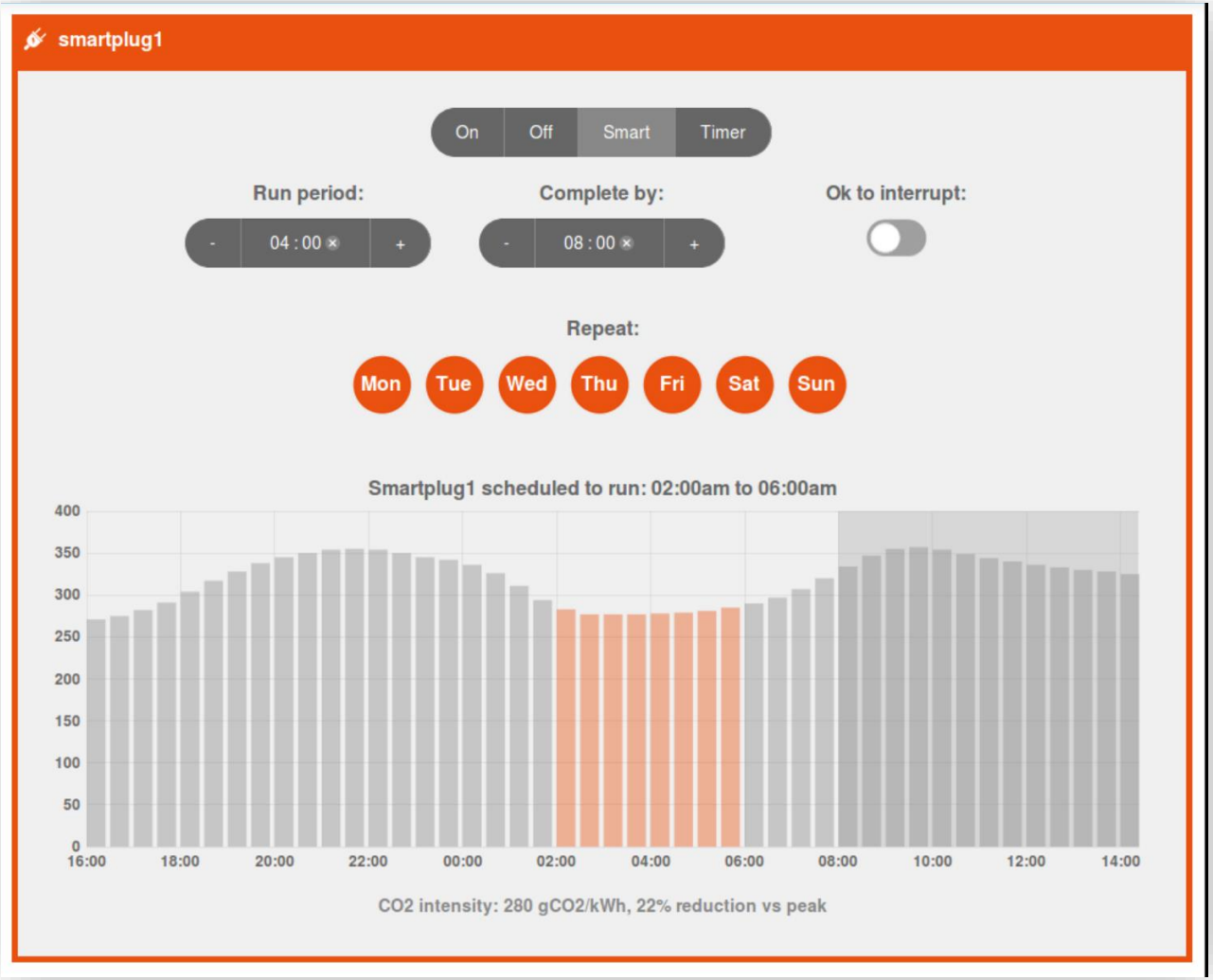
The scheduler- not just behaviour change.



I need this done by x time, It takes x hours

–

find the best time to do it.

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And a bit more….

- A Community as a whole aims to turn down between their group of MPANs rather than one particular MPAN – bit like the national demand flexible scheme.
- Use a probability basis for the amount of turn down possible
- Less likely to be ‘gamed’ given the other incentives within a club
- Trialled an ‘emergency turndown’ 4 times in Bethesda between 4-8pm

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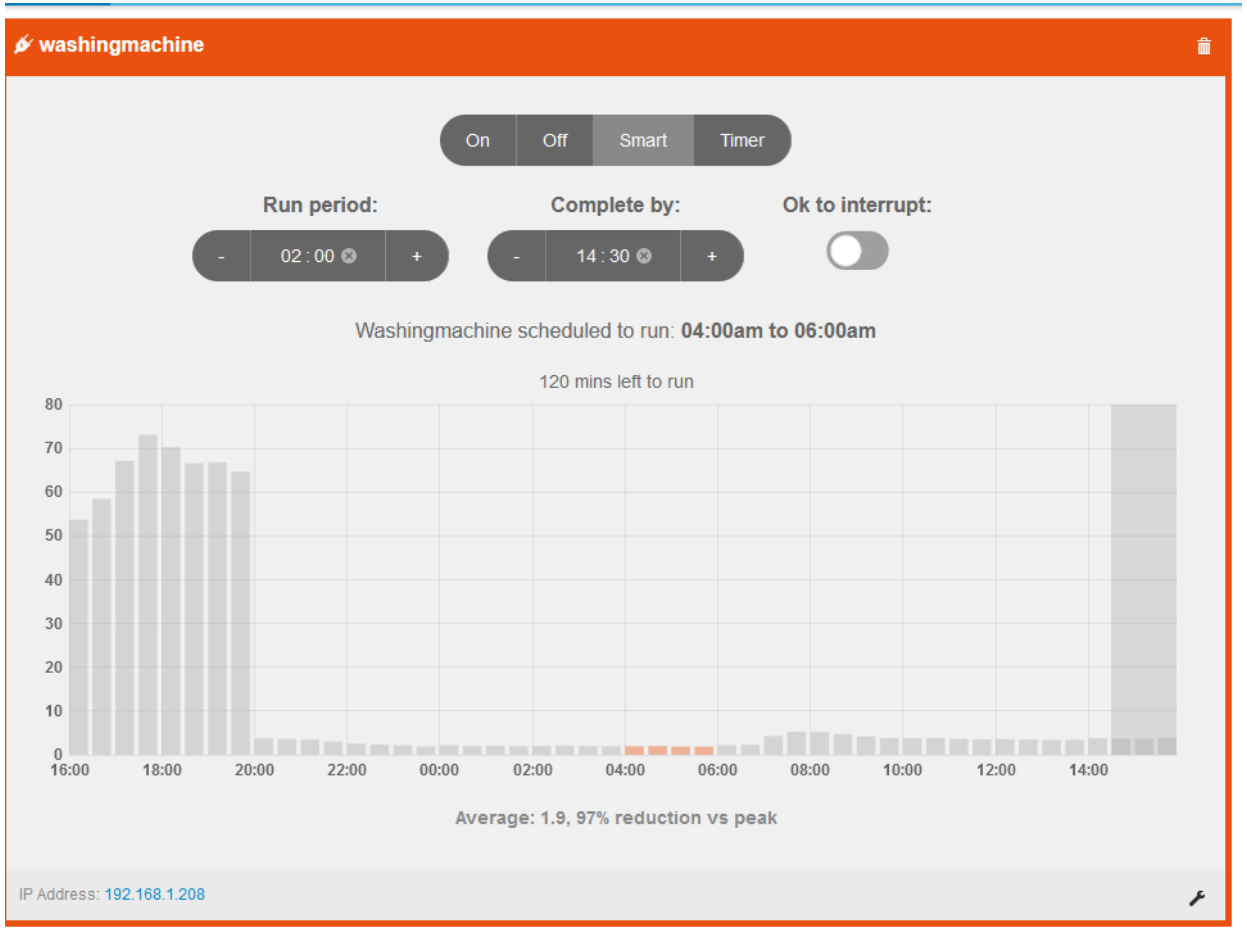
So

- Trialled a ‘community flexibility’ contract.
- A collective group of MPANs will turn down.
- Already on Energy Local – how much more can they turn down?
- We already have data from smart meters – can just give this to the DNO (again)



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So how did we do -erm

- Headline – about 10% shift away from peak period.
- Quite hard to calculate
  - same mean but big variance from one fortnight to the next.
  - A year of Energy Local people have reduced their demand overall
  - Temperature has an impact.
  - Already shifted the peak to 7.30-8pm

More work needed…..

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10% of what?

- Main measure was change in percentage of demand used between 4-8pm compared to the whole day. About 10%!
- Number of half hours 90% and 85% of maximum demand.
- Difference in ratio between base load and maximum demand.

More work needed…..

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Modelled Scenarios

Scenario name	Households	Renewable generation	Electrical heat?	Electric Vehicles	Home hub control?
1 – Bethesda	97	100kW hydro, generation profile as per real life data	1 household	None	20 HHs
3 – Low heat pump penetration	100	15 kW solar distributed among HH	10% households heat pumps	None	HHs with heat pumps + 10% others
5 – high heat pump penetration	100	15 kW solar distributed among HH	60% households heat pumps	None	HHs with heat pumps + 10% others
8 – high EV penetration	100	15 kW solar distributed among HH	1 household	50% households have EVs	HHs with EV + 10% others

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Shifting

Scenario name	Max HH demand before	Max HH demand after	% change	Average HH demand before	Average HH demand after	% change
1 – Bethesda	46.87	42.96	-8.35	20.49	19.89	-2.91
3 – Low heat pump penetration	65.35	60.13	-7.99	26.44	25.81	-2.36
5 – high heat pump penetration	147.11	154.91	5.30	38.92	38.87	-0.13
8 – high EV penetration	62.73	57.25	-8.74499	30.95	30.68	-0.87664

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So… DNOs we could really help you…..

- Network constraints at transmission and distribution are preventing connection of renewables and LCTs, network upgrades are costly particularly in remote areas.
- Could provide non-firm connections that are only constrained if local balance does not take place.
- Offers alternative of viable heat networks removing new load from LV feeders.
- Viable option for storage.
- Hebrides is a good example. 50kW limit on connections.

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But

It will only happen if

- DNOs work with us a to how local balancing on a community level can be integrated into BAU.
- Long term relationship for long term flexibility – 5 year flexibility contract doesn’t help investment for a heat network!
- Work with us to introduce ‘community flexibility’
- Work out how reducing impact on transmission can be taken into account for new renewables.

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