

Energy Local – Local balancing and demand response

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The Energy Local model

Our Vision

Energy Local's aim is to help thousands of communities to get more value from renewable generation by using it locally.

By sharing local generation we can:

- reduce the cost of electricity,
- tackle fuel poverty
- give local renewables a fair price for their power
- keep the financial benefit local to build stronger, fairer, more resilient communities.

Energy Local

Energy Local is a social enterprise that is transforming the electricity market for local communities and small-scale renewables.

The problem

If local generation is not used on site when it is generated, it is sold at ~7p/kWh and neighbours, who may have invested in it, have to buy it back at over twice the price.

Domestic customers are not rewarded for matching use to local generation or using power at cheaper times of day.

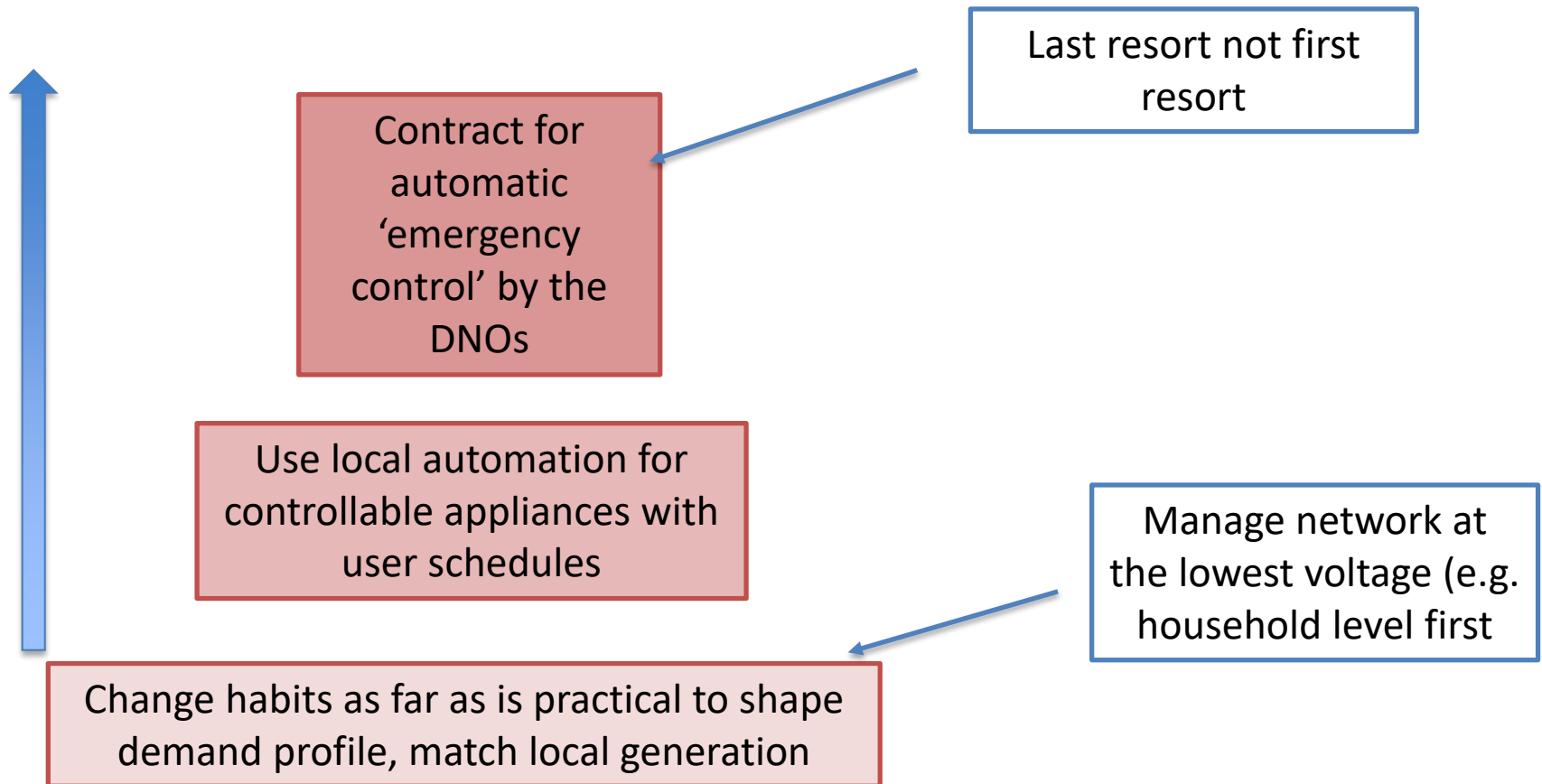
An Example of Energy Local

- Ynni Ogwen (Ogwen Energy) built their first community-owned hydro but under current arrangements, the generation is sold for $\sim 7\text{p/kWh}$ and residents, who struggle with their bills, still pay up to 18p/kWh .
- With Energy Local, participants and the hydro form an Energy Local Club.
- The supplier installs smart meters which show when power is used as well as how much. Club members can show the amount of power they use at the times when the hydro is generating.
- Members will agree the price for the local hydro they use when it is generating, e.g. 7p/kWh .
- Households get cheaper power and the hydro plant receives a higher income – more money for the community.

What's this got do with a DSO?

- Energy Local brings together the supply market and active networks.
- Gives enough value to by bringing these together to make local balancing worthwhile.
- Gives incentives other than individual finance
 - keeping income in the local economy
 - working as a community
 - supporting green power

DSO – bottom up approach



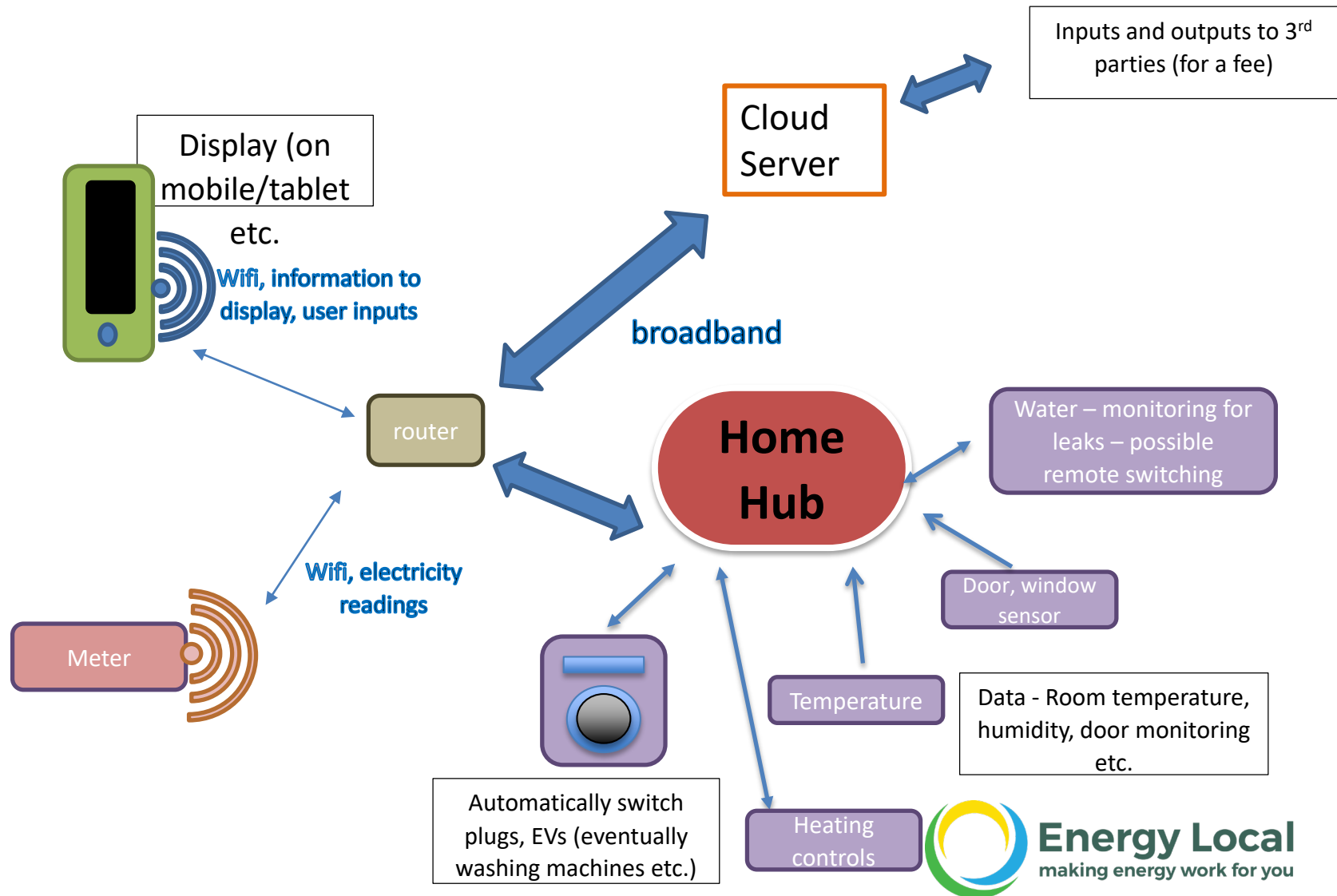
In practice - the Home Hub

- To help maximise the benefit of Energy Local for households it provides:
 - Information on their and the community's electricity use, half hour by half hour, minute by minute.
 - Forecast of local generation and generation forecasts at a community level.
 - Ability to schedule loads automatically according to user preferences, generation and community demand.
- User-driven demand scheduling – no 'big brother'.
- Offers low cost communications from meters for renewables above 30kW – system offers a significant cost saving.
- **A low cost platform for other digital services.**

PARTNERS: OEM, ePower, Connected Response



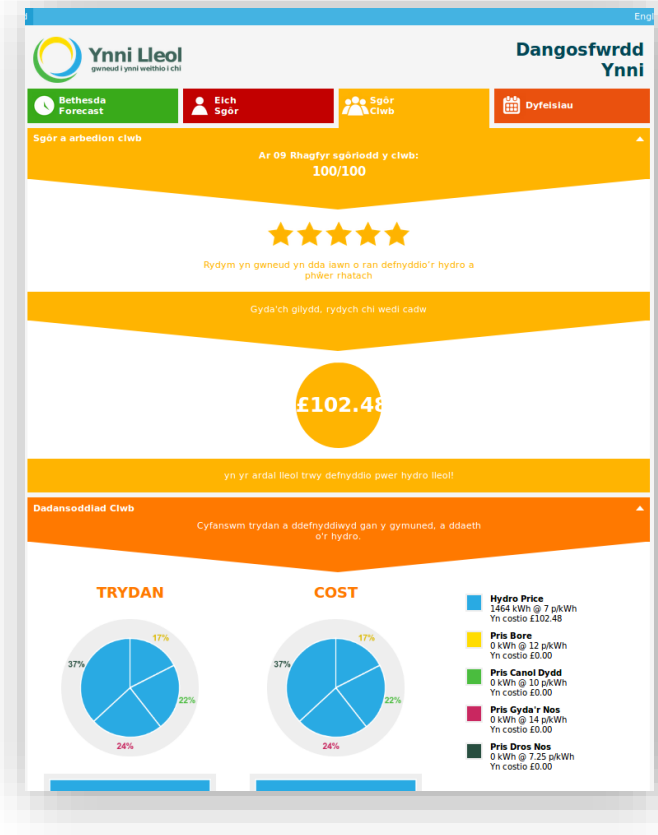
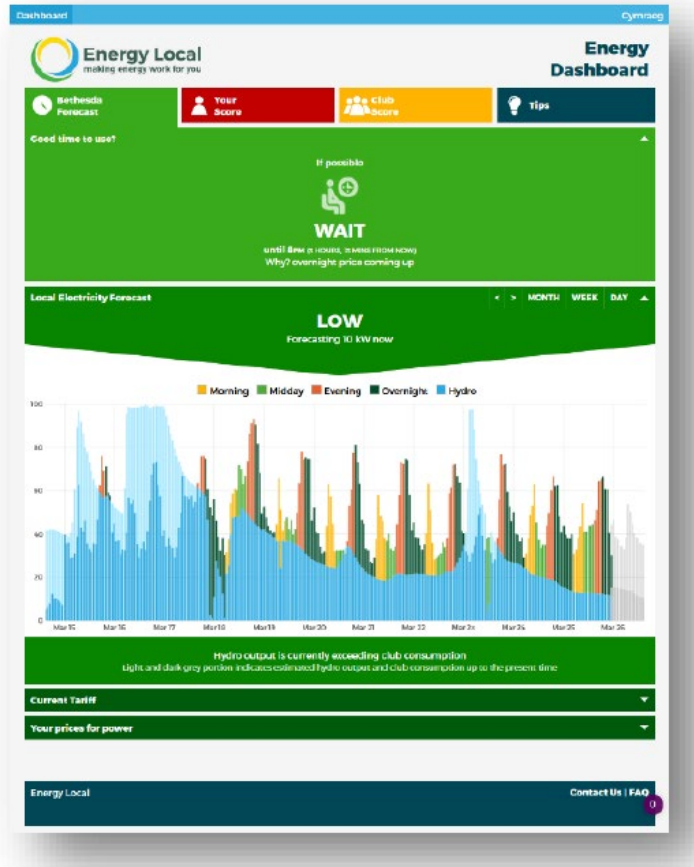
The Home Hub



A system for local needs

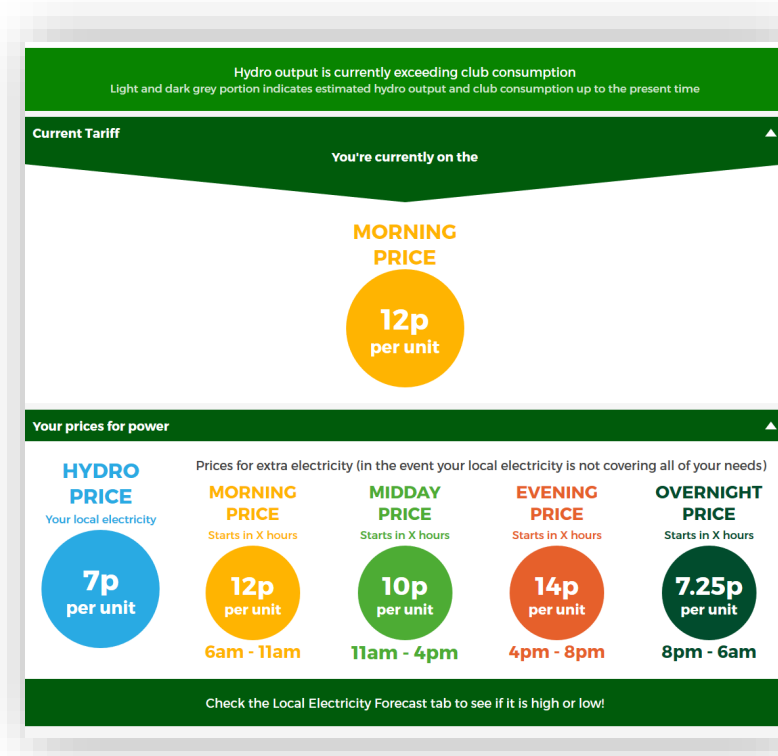
- Tailored for local needs.
- Sharing hardware and server for different services to keep costs and fees as low as possible.
- A platform for different digital applications.
- Welsh voice recognition?
- Local support
- Open source
- Low cost – integrate with a range of other systems.

The 'energy dashboard' - a few screenshots



Basic user display up and running
www.cydynni.org.uk

The 'energy dashboard' - a few screenshots



Tips CY

LIGHTS

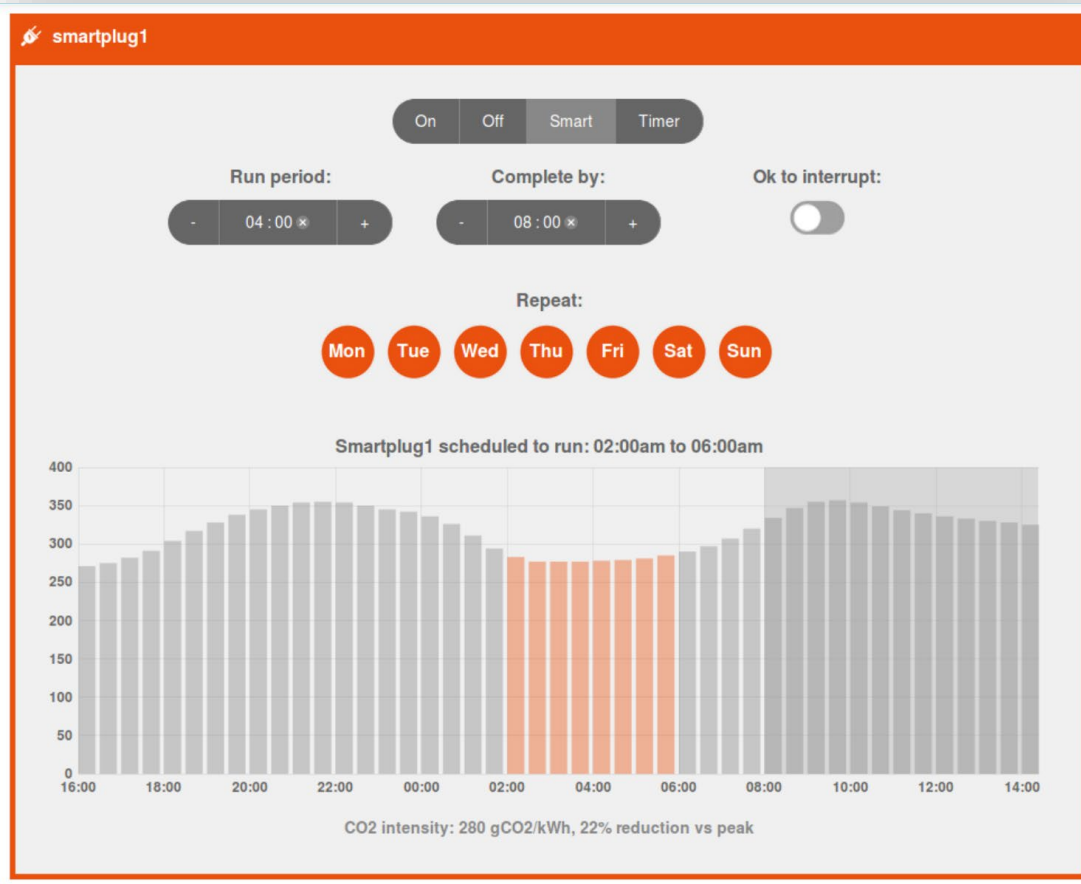
Switching off lights and appliance when not in use is a simple and effective way to use less electricity. You can make a special effort to do this during the morning and evening peaks.

< PREVIOUS NEXT TIP >

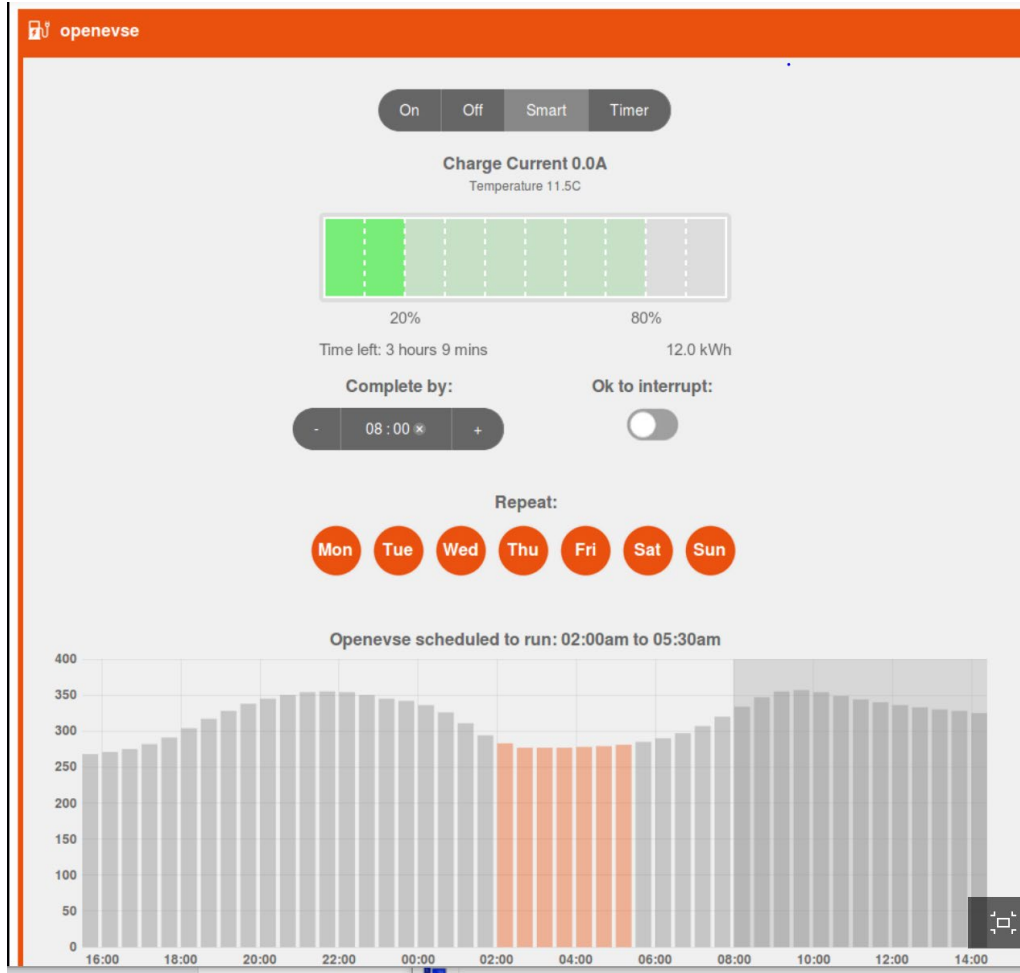
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The scheduler

I need this done by x time, it take x hours – find the best time to do it.



The scheduler – for EVs



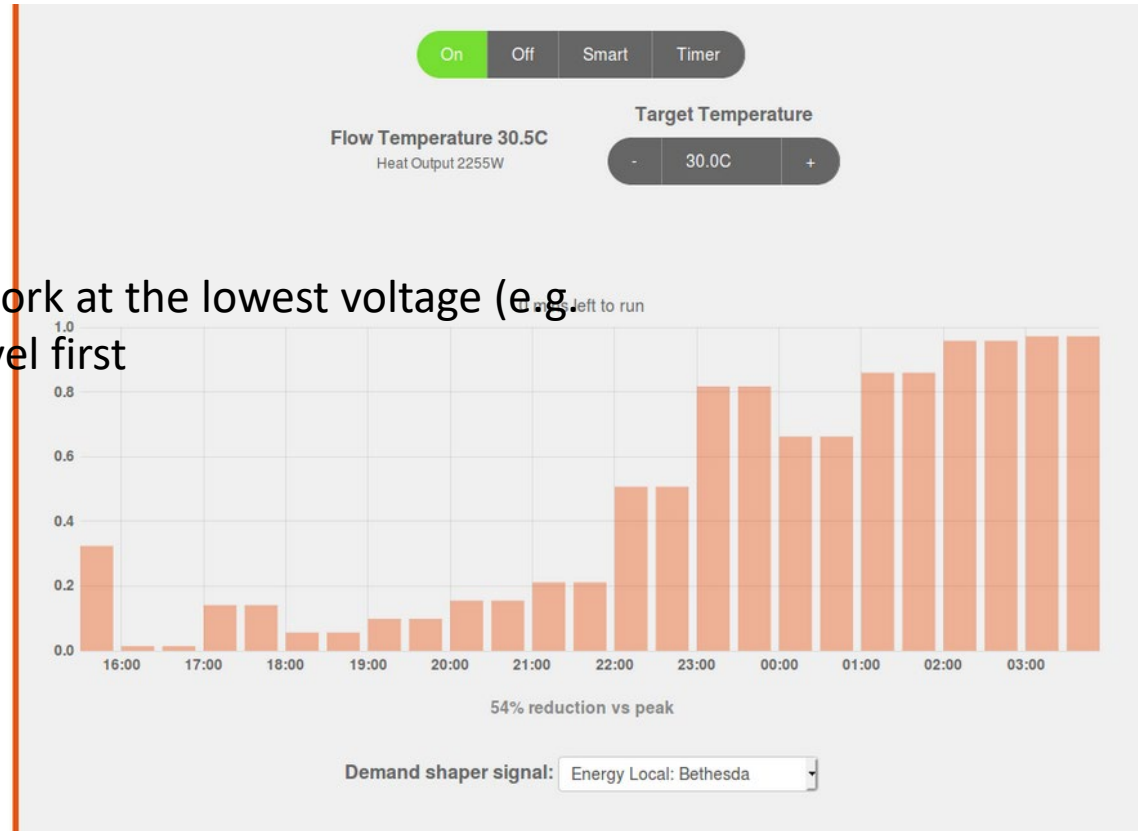
I need X charge by Y time

Aim to 'play nicely' with other home devices

The scheduler – for heating systems

Uses temperature
but we need to
convert this to 'I
need to feel
warm.....'

Manage network at the lowest voltage (e.g. household level first)



Communications

Developing a wired-in CAD to provide meter communications with SMETS 1,2 and advanced meters and dumb meters with pulse output.

Outside the home:

- Broadband or LORA (for remote areas) or Zigbee mesh.

Inside:

- Broadband, Doorbell, Zigbee.....

Provides low-cost reliable, 2-way communications to individual meters, real time.

Provide real time remote network measurements.

Low lost comms for HH metering for generators

Advantages

- No complicated contracts for customers, just work with their local community.
- Opportunity for DNO/DSO to liaise with a group of customers in one location.
- 'Mrs Moggs' is carrying out local balancing without knowing it.
- Do as much as is possible locally. – No 'Big Brother'

What next?

- Need 1000 customers on Energy Local in clubs by mid 2020.
- Opportunity to demonstrate the benefit to the network.
 - How much headroom is created by changing habits
 - How much more headroom is available for emergency turndown – if demand is already smoothed?
 - How can this be converted into new planning criteria/ratings – these are also built on probabilities at present.
 - What is the value? e.g. of allowing a DNO to switch off you EV charger?

Values and information

- A network constraint is physical, markets are just about money.
 - If its my EV charging or Granny getting cold, I will let you switch off the charger.
 - If its my EV charging or the supplier paying out, I want my EV charged.
- So – we need to build trust that an emergency is an emergency
 - We would like network information displayed on the dashboard – e.g. from Open LV, so people know its for real.
- Let people know
 - Blink the lights, beep on a phone??

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