

Energy Local smart grids and demand shifting

Dr Mary Gillie

About me

- Physicist and engineer
- Worked on field trials and feasibility for all the UK DNOs for 'smart grids'
- Increasingly involved in community energy
- Recognised the need for local markets for communities, distribution network and national electricity market
- Fed up with treating the symptoms not the problems
- Saw an opportunity in the market with advanced metering, founded Energy Local

What we are trying to achieve?



- Win for local groups,
 - Greater income for renewables,
 - Economic multiplier, reduce bills
 - Everyone can be involved, not just share holders.
 - Interaction with people!
- Win for suppliers
 - smoothing local curve, reduce the risk of imbalance
 - low cost of sale,
 - new relationship with customers
- Win for DNOs –
 - a commercial arrangement to facilitates local balancing.
 - potential simplify ANM at LV so it is not safety critical – no local balancing and gen is tripped
 - New opportunities for DUoS

What are the jigsaw pieces



- Rewards local balancing – without penalising generation or demand.
- Signals from local network measurements to encourage/control demand side response.
- Ability to provide demand side response/ancillary services from many small loads without 'big brother'.
- Local market that does not incur the costs of national settlement processes unnecessarily
- DUoS charges that gives due reward to local balancing.
- Engages consumers & communities – of all types in a manageable way.
- Advanced metering that facilitates the above.

Advanced metering



- Energy Assets, ePower, and Energy Local are working together to use advanced metering to provide
 - Real time remote network measurements
 - 1 to 1 polling of meters
 - Real time access to meter readings on a community scale
 - Innovative 'energy dashboards'
 - New services for prepayment

Energy Local



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

Works with existing organisations as much as possible.

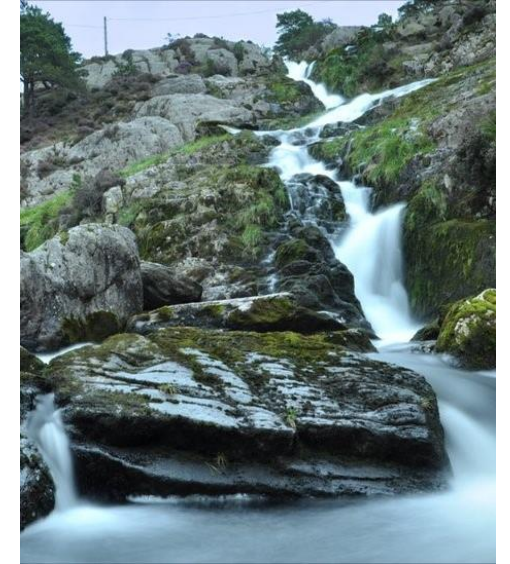
The problem

- If local generation is not used on site when it is generated, it is sold at ~5p/kWh and neighbours have to buy it back at over twice the price.
- Domestic customers are not rewarded for matching local power or using power at cheaper times of day.
- Reduces income to local economy.
- Renewables are not as viable.

Energy Local – an example



- Ynni Ogwen (Ogwen Energy) raised funds for their community-owned hydro.
- They lose out with the status quo selling at 5-6p/kWh, buying at ~13p/kWh
- With Energy Local, households and the hydro form an Energy Local Club.
- Club members show the amount of power they use when the hydro is generating with an advanced meter.
- Members agree the price for the hydro they use when it is generating, e.g. 7p/kWh.
- Households get cheaper power and the hydro receives more money.
- Supplier provides billing and 'extra power' on a TOUT.



Energy Local – end to end trial

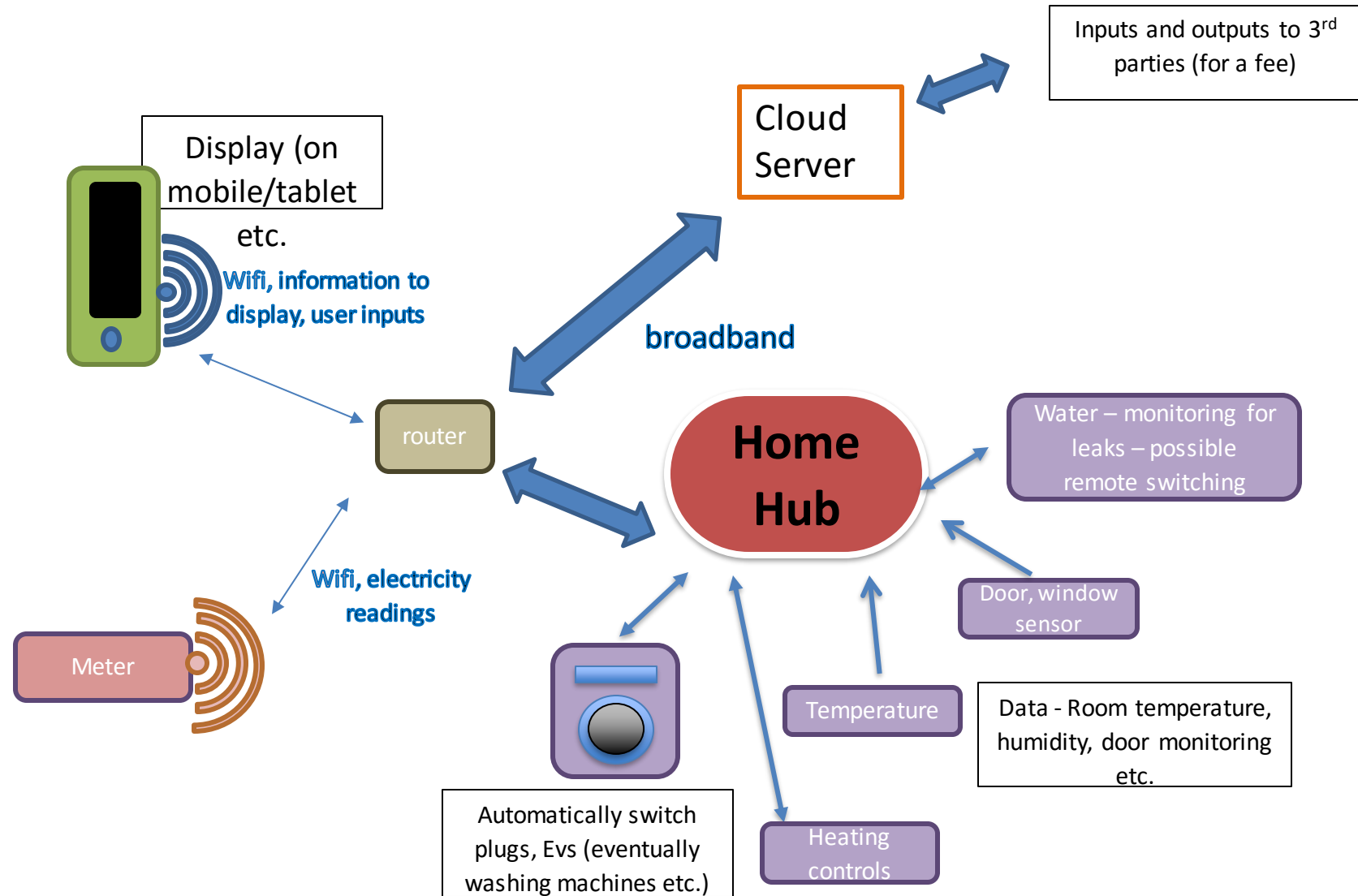
- Recruited 100 participants
- Switched to Coop Energy and formed an Energy Local Club.
- Now have 90+ on the Energy Local tariff matching with the hydro output
- Created an 'Energy Dashboard' – cydynni.org.uk
- Formed Energy Local CIC
- Still ironing out the wrinkles behind the scenes.
- Need to get to a 'cookie cutter' process – well a rubbery one.



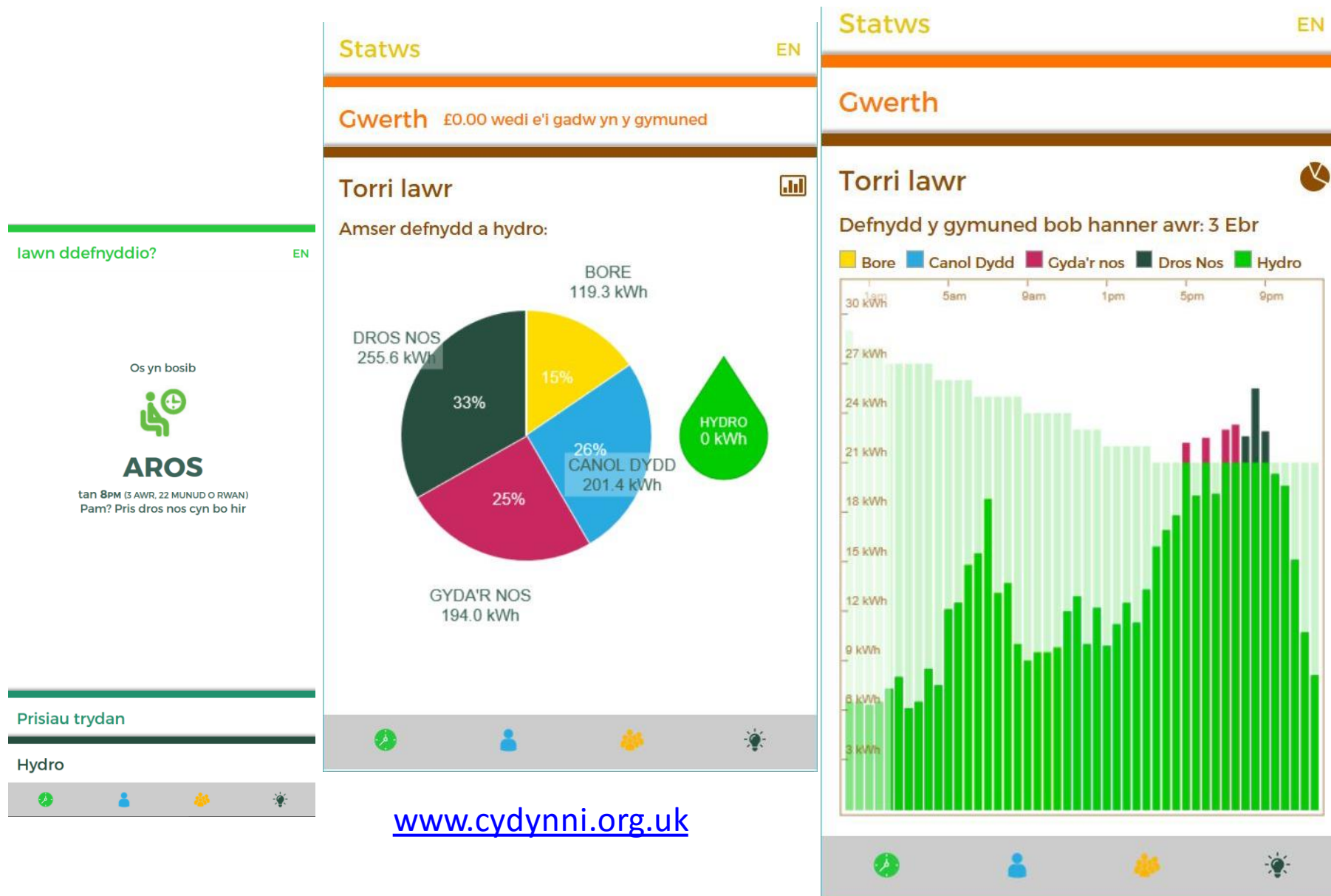
Results to date

- Savings in bills, income to generators
- Shown it is possible to shift demand to match generation.
- Community endeavour and interaction greatest driver.
- People learn 'rules of thumb' and become aware.
- They love talking to each other and local experts – not preachers!
- Much more efficient at a community level.

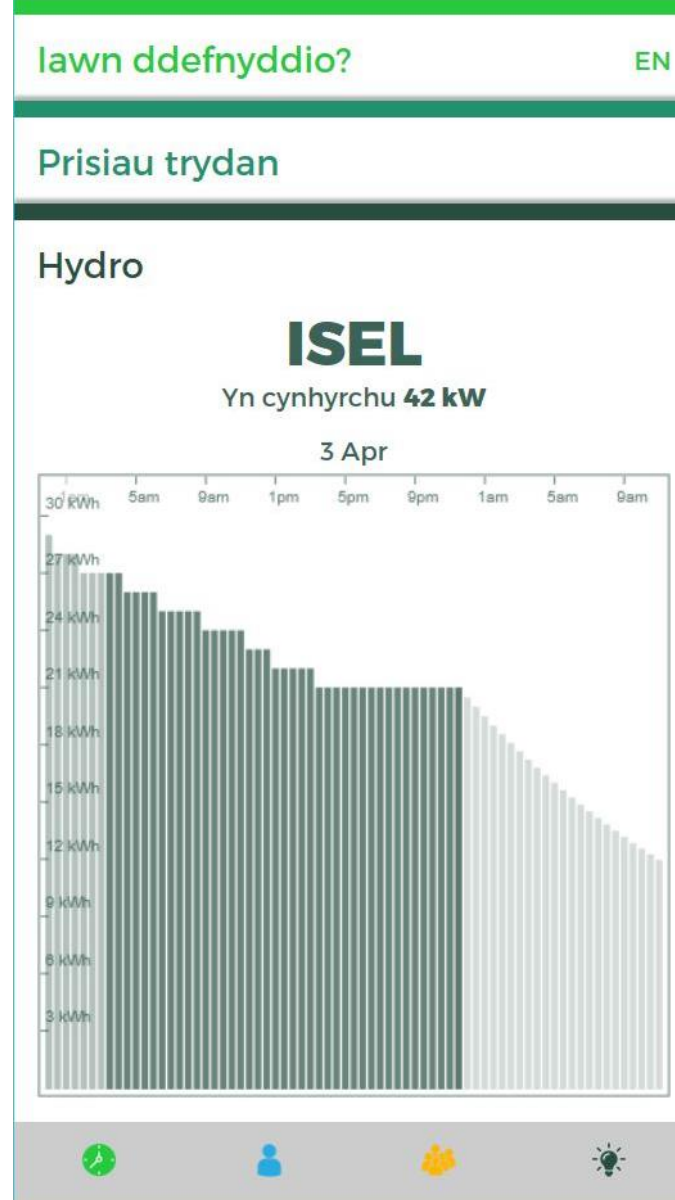
The Home Hub



The 'energy dashboard' - on a phone/laptop - somewhere useful!




The 'energy dashboard'



www.cydynni.org.uk



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 >

The Home Hub

- To help maximise the benefit for Energy Local for households it provides:
 - Information on their and the community's electricity use, half hour by half hour.
 - Forecast of local generation
 - Ability to schedule loads automatically according to user preferences and generation forecasts at a community level.
- 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.**

The Home Hub

- Sends a probability signal to each house for good and bad times to use power.
 - Based on tariffs
 - Forecast generation
 - Power use of the Club as a whole.
- User selects when they want an appliance to be finished and how long, if the interruptible
- Hub will select the best time for the appliance to run.
- Avoids voltage step changes.

The 'home hub'

- We are working with Open Energy Monitor – this system is not locked down – local areas can adapt/add to the dashboard.
- We can easily add sensors, new comms
- One adaptable hub can be used for many uses.
- Plan to interface with Google, Apple and Amazon etc. – get the best of both worlds.
- Want to work with DNOs to improve Active Network Management

Which building blocks do we have?

- Technology to match load and generation locally – tick!
- Advanced meters and associated communications – tick!
- New local organisations – tick!
- New market model that enable reward for local balancing but does not – getting there with Energy Local
- Low cost, open home appliance scheduling – starting to get there, not Big Brother!
- Better UoS charging – errr!

But not Business as Usual Yet

Contact



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