Open Utility

A glimpse into the future of Britain's energy economy

Supported by

Good Energy

Department of Energy & Climate Change

nominet trust

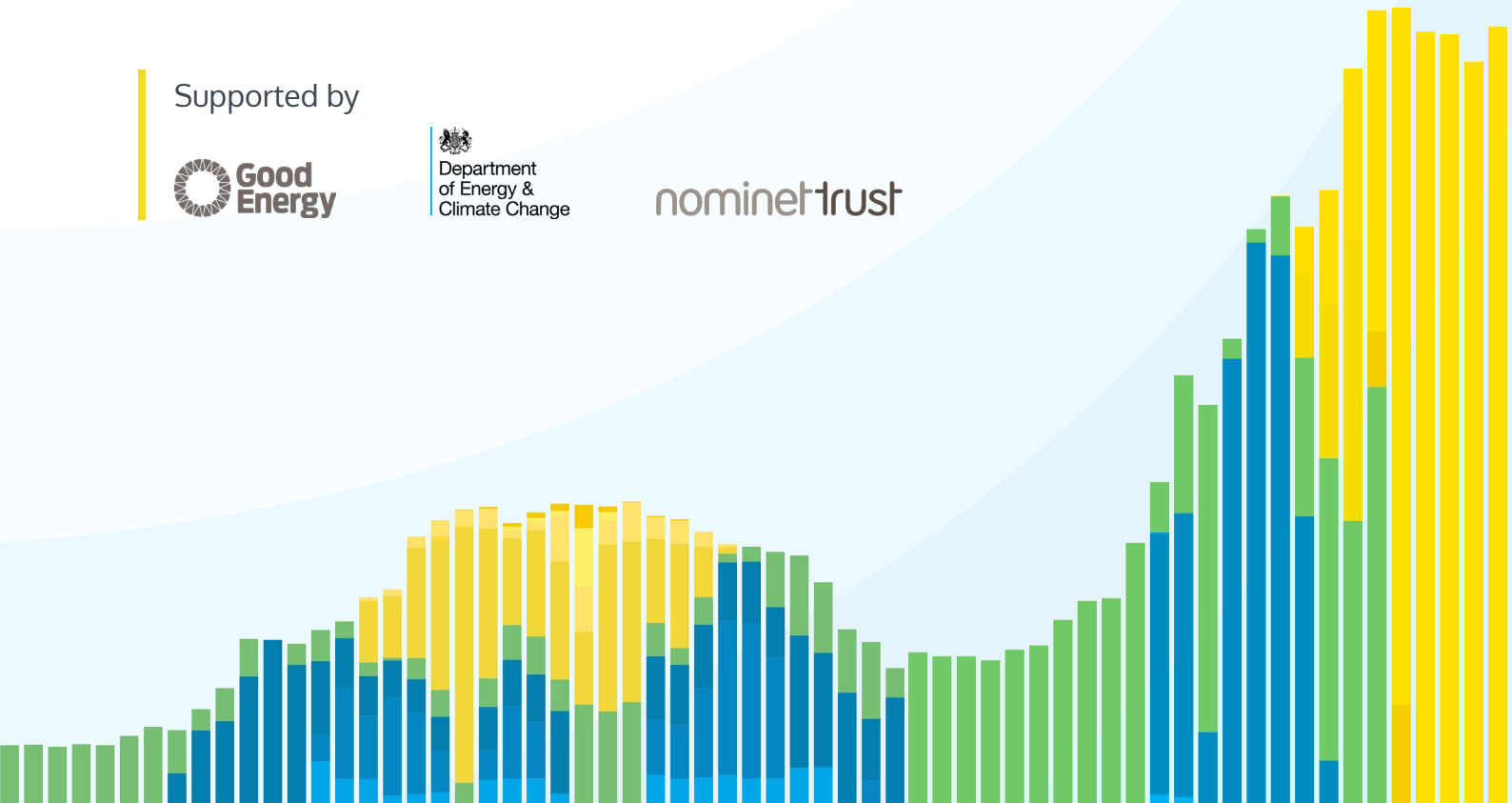


Table of contents

Sychpant Farm Turbine.

Executive summary

The energy industry is in the midst of a revolution!

We are moving away from the traditional, centralised fossil-fuel power stations towards a local low carbon energy economy – where decentralised generation turns buildings into mini power plants and communities take control of their energy supply. Common sense tells us that there should be financial benefits when electricity is consumed near to where it is generated.

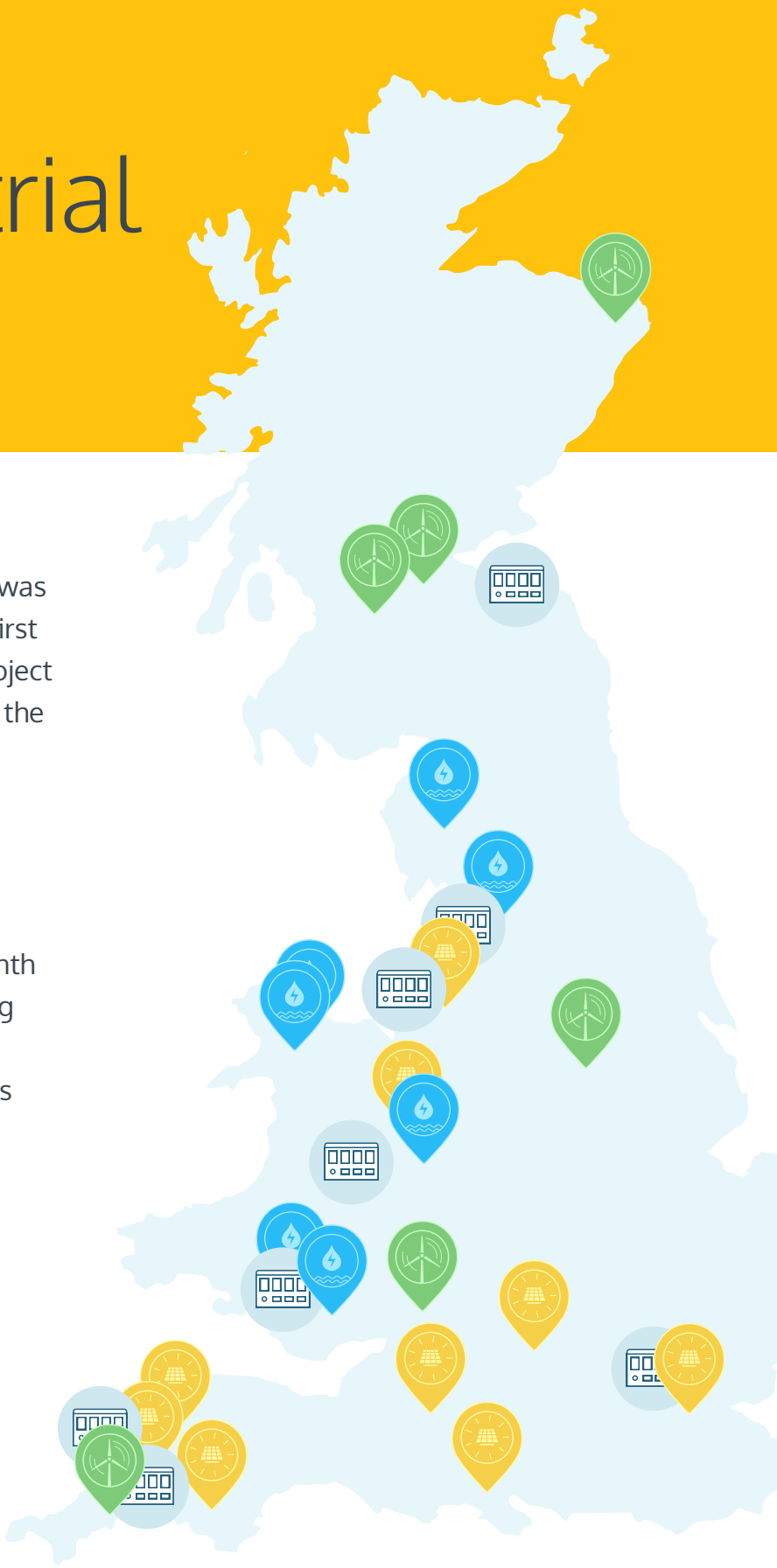
Piclo, Britain's first online peer-to-peer marketplace for renewable electricity, is the first step to realising those benefits. The service, trialled by Open Utility and Good Energy, offers unprecedented customer empowerment and removes barriers to individual participation in the electricity market.

The peer-to-peer matching system upon which Piclo is built brings renewable tariffs to life. Unrivalled transparency, showing where consumers source their electricity was welcomed by participants and led to very high engagement rates. Cornwall emerged as a buzzing local energy market – with some generators, like the community-owned turbines at Gorran, supplying almost 100% of their electricity within 33 miles.

> Our aim is to change the way people interact with energy
>
> **– Open Utility**

Looking to the future, Open Utility have developed a change proposal for Ofgem, so that consumers and generators can be charged more fairly for using the local distribution grid. Using peer-to-peer energy matching to determine how much of the grid has been used, the new methodology has the potential to unlock billions of pounds for decentralised generation and communities over the next ten years – not just in Great Britain but across the world.

About the trial



After 12 months of development, Piclo was launched on 1st October 2015. For the first time, business consumers like Eden Project could buy their electricity directly from the source.

The trial was a collaboration between innovative technology company Open Utility and 100% renewable energy supplier Good Energy. The initial 6-month service was made possible with funding from the Department of Energy and Climate Change's Energy Entrepreneurs Fund, and Nominet Trust – the UK's leading "tech for good" funder.

Good Energy

Department of Energy & Climate Change

nominet trust

Some of the consumers and generators on Piclo:

National Trust

WATERGATE BAY HOTEL

BDP.

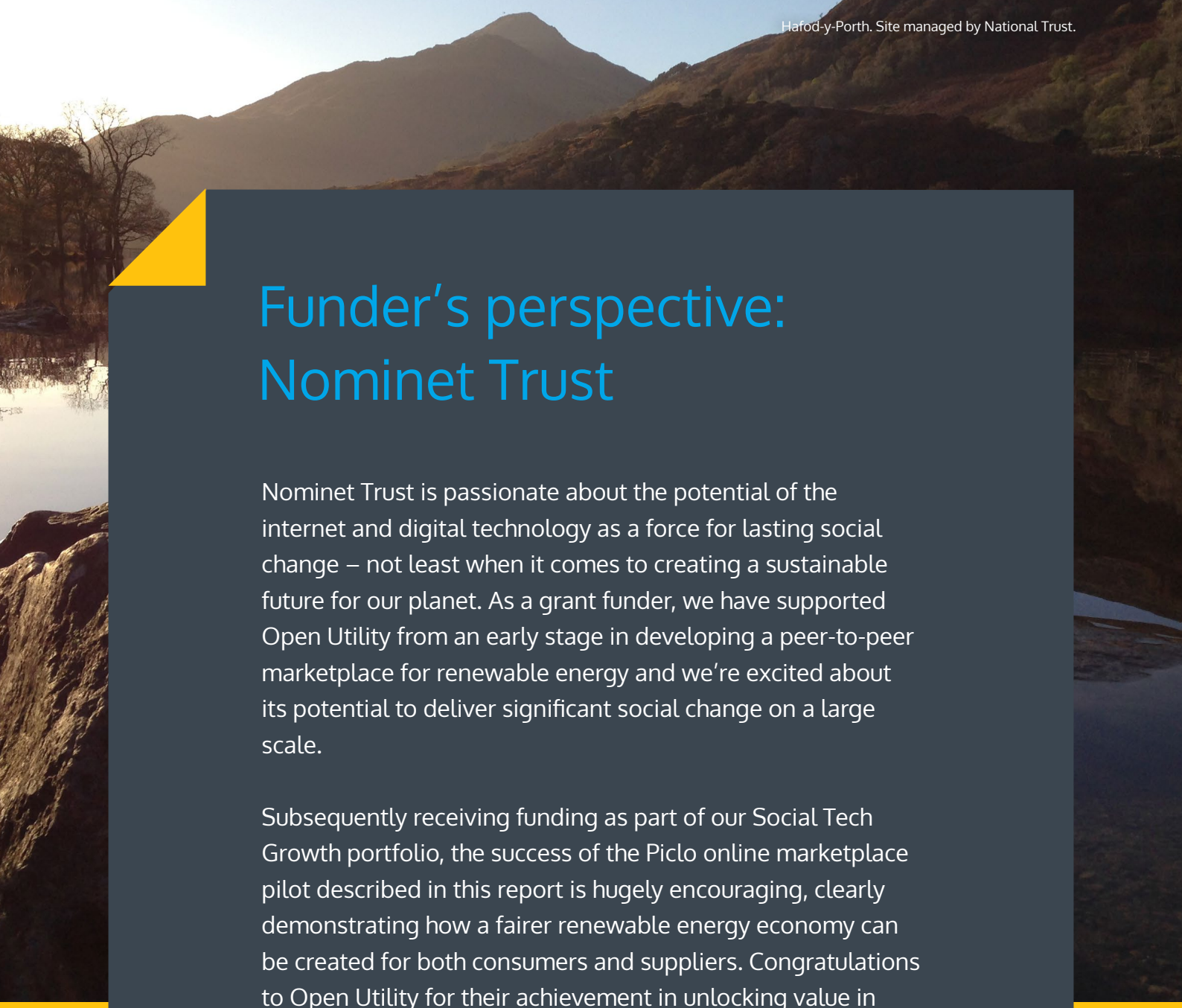
eden project

BRIXTON ENERGY

Community Power Cornwall

CARDIFF CAERDYDD

The Olde House
A holiday for all seasons



Hafod-y-Porth. Site managed by National Trust.

Funder's perspective: Nominet Trust

Nominet Trust is passionate about the potential of the internet and digital technology as a force for lasting social change – not least when it comes to creating a sustainable future for our planet. As a grant funder, we have supported Open Utility from an early stage in developing a peer-to-peer marketplace for renewable energy and we're excited about its potential to deliver significant social change on a large scale.

Subsequently receiving funding as part of our Social Tech Growth portfolio, the success of the Piclo online marketplace pilot described in this report is hugely encouraging, clearly demonstrating how a fairer renewable energy economy can be created for both consumers and suppliers. Congratulations to Open Utility for their achievement in unlocking value in local energy markets with this innovative new approach.

– Vicki Hearn, Director of Nominet Trust

37 consumers and generators from across England, Scotland, and Wales participated in the trial. It was open to sites with half-hourly settled meters that could hold contracts with Good Energy.

How Piclo works

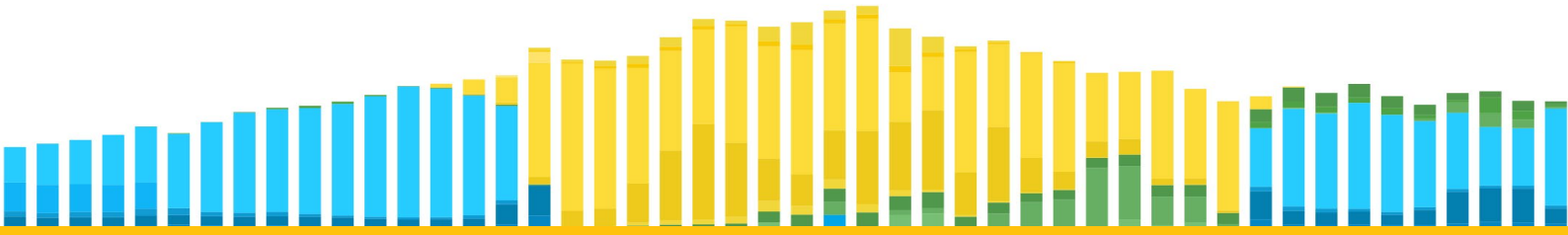
Piclo uses meter data, generator pricing and consumer preference information to match electricity demand and supply every half hour.

Generators have control and visibility over who buys electricity from them.

Consumers can select and prioritise from which generators to buy electricity.

Piclo matches generation and consumption according to preferences and locality, providing customers with data visualisations and analytics.

Good Energy provides contracts, meter data, billing, award-winning customer service, and balances the marketpace.

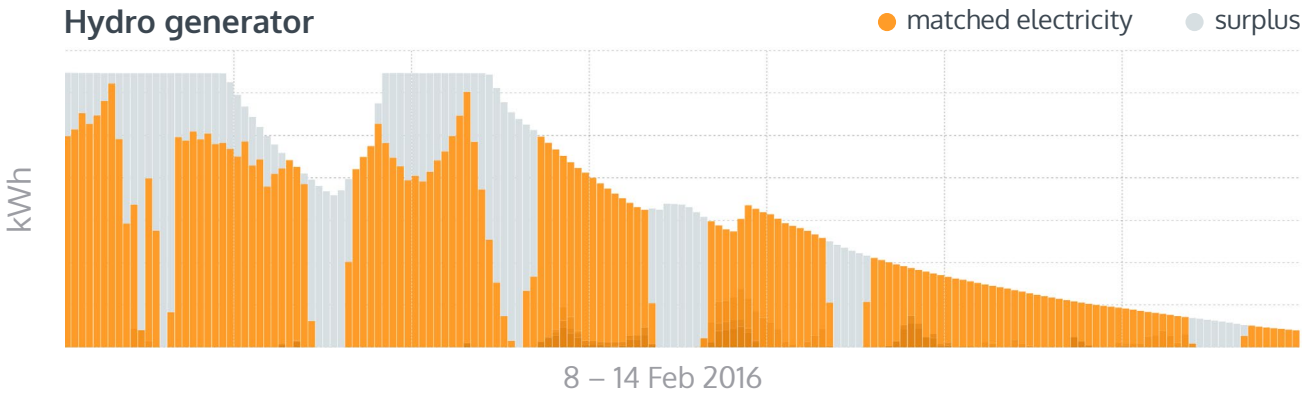


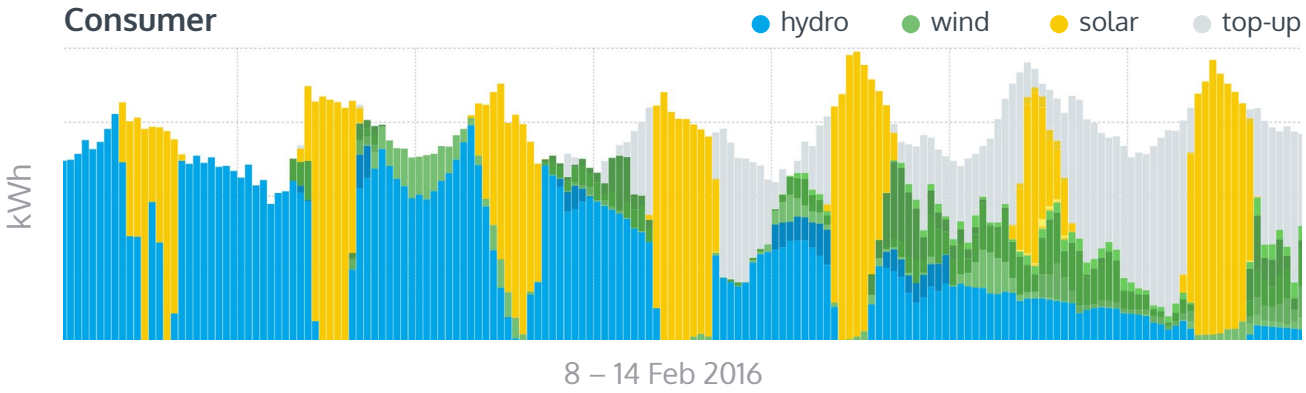
Designed for electricity retailers and their customers

As a customer facing product, Piclo is mobile friendly and engaging, whilst providing robust tools for the electricity retailers to review their customers' activity as a whole.

Energy matching on Piclo

Example 1. During the week of 8 - 14th February 2016, a consumer sourced over 39% of its supply from a large hydro generator. The orange pattern from the generator's graph is replicated in blue on the consumer's graph. The consumer also matched with a large solar farm during day time. This demonstrates that different technology types can complement each other to balance the electricity portfolios.





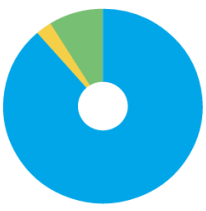
Example 2. Stats for a consumer in Cornwall, showing how matching can be affected by seasonal variation in renewable generation.

October 2015

45.8 %
matched electricity

51.4 miles
avg. matching distance

March 2016



85.6 %
matched electricity

35.8 miles
avg. matching distance

Bringing renewable tariffs to life

Westmill Solar

Open Utility believes that businesses and homes are more likely to use renewable energy if people feel emotionally connected to the source. We want to celebrate renewable energy and – using the power of online digital services – bring renewable tariffs to life.

Gorran Turbines. Site managed by Community Power Cornwall.

During the trial, account holders regularly logged in to see where their electricity was coming from, or to whom it was going. They used this information to engage with their own customers, demonstrate sustainability credentials or to feel rewarded for buying renewable energy.

50-60 %

of people logged in at least once a month

20 min

average time spent on Piclo each month

3x higher

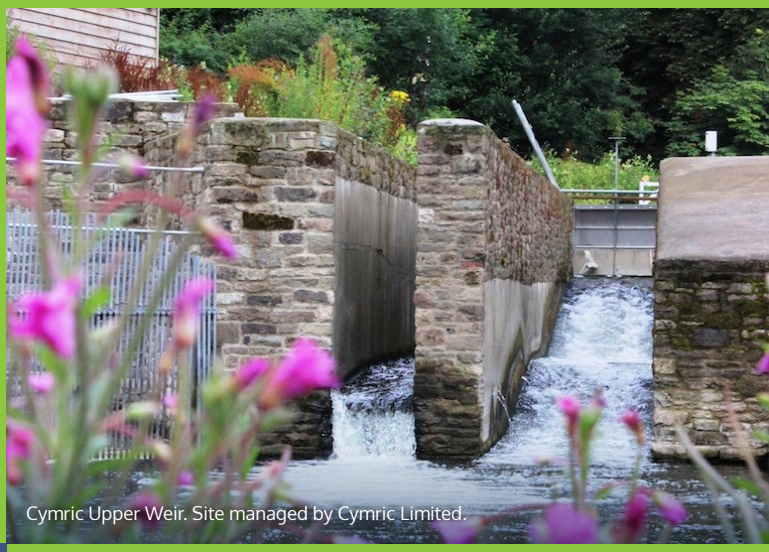
email open rates compared to industry average[1]

21 %

of customers wanted to add more sites to Piclo

177 mi/kWh

average distance travelled by all matched electricity on Piclo during the trial



Cymric Upper Weir. Site managed by Cymric Limited.

Gorran Turbines. Site managed by Community Power Cornwall.

> The Piclo pilot has been a great experience for National Trust. It has provided a transparent, easy to use mechanism for the Trust to offer its renewable energy to consumers wanting to source from a renewable generator. The features including daily, weekly and monthly graphs showing energy generation and matched consumers, were really helpful in understanding the demand for our energy at different periods. It will be interesting to watch the future development of this concept.
>
> **– Rosie Frankland, National Trust**

Hafod-y-Llan. Site managed by National Trust.

Our **@bdp_com** London studio are using **#Piclo** by **@GoodEnergy** allowing us to choose our renewable energy suppliers.

Susannah Goddard
@SusannahGoddard

Eden Project
@edenproject

Today we're joining **#Piclo**, **@Good Energy**'s peer-to-peer renewables market where we get to choose local suppliers!

Great to be involved with **@GoodEnergy**, **@OpenUtility** & **@edenproject** on the **Piclo** energy market trial! #renewableenergy.

Benson Signs Ltd.
@Bensonsigns

Comm Power Cornwall
@CommunityPowerC

Since #Piclo launched 100% of our generation has supplied consumers within 17miles! #communityenergy #localenergy

Westmill Solar

Did Piclo affect the price of electricity?

In the final two months of the trial, generators were able to set discount or premium prices for their energy. Initial results demonstrated a reasonable uptake of these price changes, with five consumers subscribing to different rates.

Discounts & Premiums

Generators could apply a discount or a premium to their PPA up to ±25%. Any extra amount paid by a consumer on a Premium price was passed through entirely to the generator, while any savings from a Discount rate went entirely to the consumer.

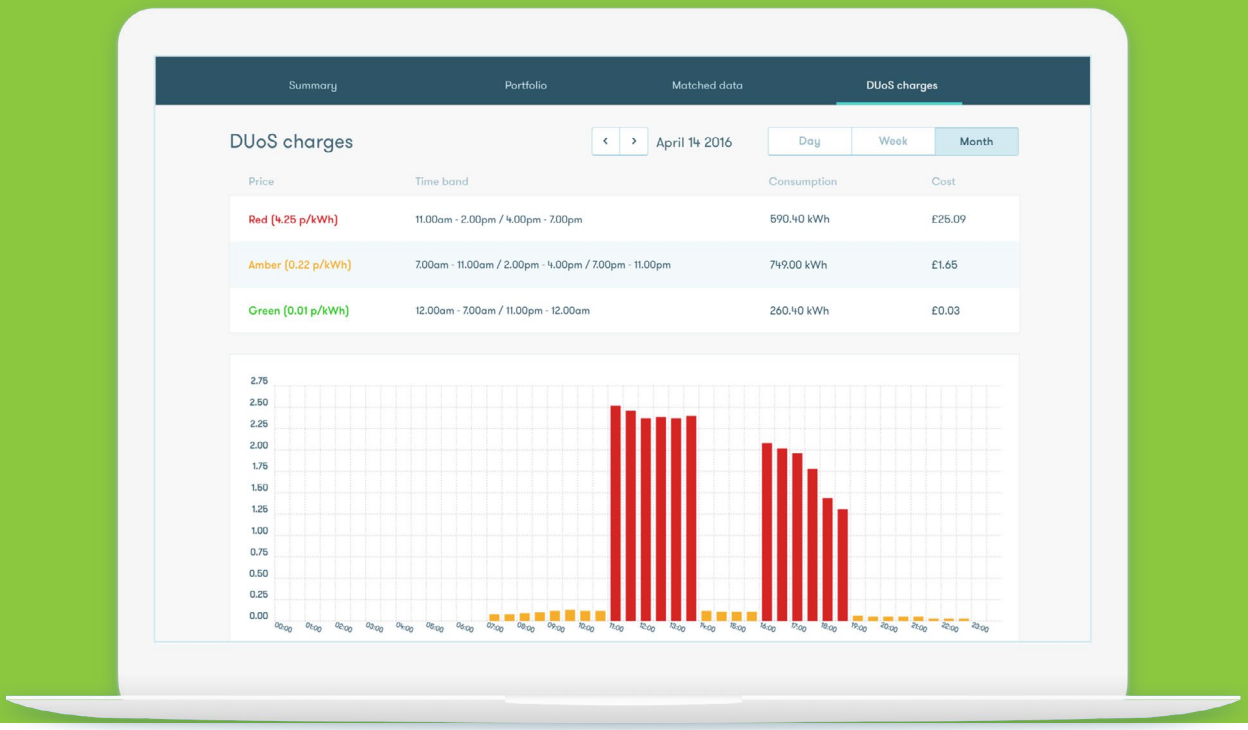
Generators could also set allocation limits, restrict access to their prices and add a supporting message explaining why consumers should buy at a lower or higher rate.

> This discount price is available to local people within 10km and those defined as in fuel poverty
>
> **– A community energy group**

Were there other savings?

Consumers pay **Distribution Use of System (DUoS) charges** to cover the Distribution Network Operator's (DNO) costs for the delivery of electricity to them. Based on a time-of-use calculation for half-hourly metered import customers, the charges are split into red, amber and green time periods. The red peak time can account for up to **93%** of the total DUoS costs, even though it only covers a fraction of the time – a couple of hours per weekday.

Piclo offers visualisation of those charges and incentivises consumers to shift and reduce their usage during peak times.



> The red peak time can account for up to 93% of the total DUoS costs.

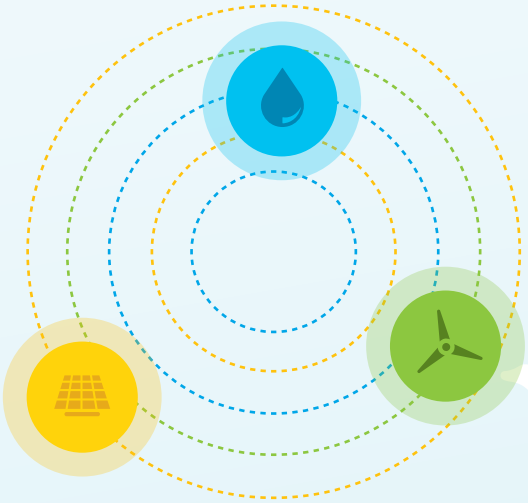
Piclo was a big step forward in helping consumers understand their DUoS charges. In general, most people relate lower bills with lower electricity consumption. Changing the time of use is a new concept, which will require additional support and advice to achieve cost savings.

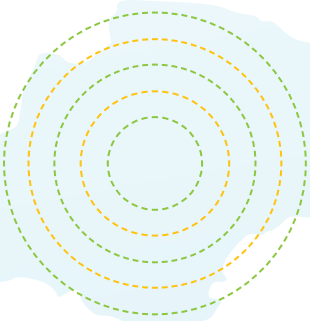
Local energy markets

A local energy market is an emerging concept with the decentralisation of energy generation. As increasing numbers of landowners, community groups and individuals finance and maintain distributed generation assets, the obvious next step is for the electricity to be purchased by their local community.

> Putting people in control of their energy can build stronger communities

DECC's Community Energy Strategy states that putting people in control of their energy can build stronger communities, create jobs, improve health and support local economic growth[2]. Ofgem shares this view and has outlined local energy as one of their transformative themes in their consultation on Non-traditional Business Models (NTBM)[3].





Creathorne Farm. Site managed by Good Energy.

Delabole tariff

Good Energy has a track record of delivering local tariff schemes to domestic customers. They were granted a derogation from Ofgem in January 2013, to deliver their "Delabole Local Tariff". The scheme offers residents that live within a 2km radius of the site a tariff that is at least 20% cheaper than their standard regional tariff. Good Energy also guarantees a "windfall" payment if the turbines produce more electricity than expected each year. More than 20% of eligible residents have signed up the scheme, a quarter of these are prepayment metered customers, shifting them from some of the most expensive tariffs in the market to the cheapest.

When regulators are reviewing future domestic tariff structuring requirements, it is important that Piclo or other novel supply propositions are considered.

– Will Vooght, Research and Innovation Manager and Piclo project lead at Good Energy

The concept of local can be ambiguous; to some people, local means their neighbourhood, village, town or county. To the energy industry, it can mean the distance from the generation site or connections on the same network.

Open Utility didn't define local for the Piclo trial, leaving participants to interpret it for themselves. It was an opportunity to explore whether local electricity was something that people want – and it is!

User feedback gathered during the trial suggested that most consumers didn't make decisions based on technology type, but according to their distance from the generators.

> Piclo allows us to select our suppliers and shows that we're making an effort to go for more local supply.
>
> – Paul Hobbs, Facilities Manager, BDP

Cornish local energy market

20 %

of all trial participants were Cornish, making the area a local energy market during the Piclo trial.

99 %

of Gorran Turbines' energy, a Community Power Cornwall generator, was sold in the local area.

33 miles

was the average distance travelled by matched electricity within Cornwall.

54 %

of the Cornish generation on Piclo went to four consumers in Cornwall.

A joint press release from **Eden Project**, **Good Energy** and **Open Utility** was received well in local Cornish media publications; Business Cornwall, Western Morning News, Pirate FM, Cornish Guardian, and the St Austell local paper.

Local generator support

Having suffered floods, Graham Sowter at Whalley Community Hydro set a Premium price for their electricity and added the following description:

> This price is for every customer who wishes to support a northern hydro generator who suffered quite badly in the recent floods!!

Whalley Community Hydro

The closest consumer to Whalley Community Hydro responded by accepting the Premium price, showing a **willingness to support** local generation.

Beyond the trial

Is there a domestic opportunity?

Smart metering will be a step-change for the industry, with the roll-out to 30 million households and businesses across Wales, Scotland, and England by the end of 2020. Alongside this, Ofgem recently recognised that it is in the consumer interest to be settled against half-hourly consumption data[4]. We see a complete rewiring of market processes.

Open Utility is at the intersection of these mega-trends and is developing online digital services that ensure the customer is put front and centre amid this tide of change. The company's goal is to facilitate and encourage the democratisation of energy, leading to Open Utility's vision of a world powered by renewables.

> Open Utility is at the intersection of these mega-trends.

"Darthmouth Colors" by Eduardo Fonseca Arraes. https://flic.kr/p/8tyUwY.

Driving domestic engagement

For innovative models such as Piclo to be at their most effective, regular access to granular, half-hourly data is a core requirement. Good Energy believes that the most significant untapped potential to break market inertia in the domestic sector lies with the availability of such data.

The transaction based charging regimes being introduced within the Data and Communications Company (DCC) will add significant additional cost to the scheme. Access to cost effective, regularly updated and accurate data could unlock innovation and propositions that reflect, as close to near-time as is possible, the actions a customer has taken — arguably one of the core benefits of the smart meter rollout programme.

– Will Vooght, Research and Innovation Manager and Piclo project lead at Good Energy

Can local matching lead to fairer grid charges?

The energy market regulations in Great Britain were set up under the assumption that most of our electricity is generated by a small number of large power stations connected to the transmission grid. Over the past ten years, this core design principle has been challenged with the rapid roll-out of decentralised generation. Regulatory "workarounds" have been added to combat problems but many of these are no longer fit-for-purpose, and the result is an inefficient electricity market that unfairly treats decentralised generation.

A small change to the Ofgem regulated Distribution Network Operator (DNO) charging methodology could unlock peer-to-peer energy's full potential and realise a future where grid usage is fairly charged. Generators and consumers, matching on a half-hourly basis, would only pay for the extent of the distribution network that they use. Working with Reckon LLP, Open Utility have created a change proposal for Ofgem which describes in detail the new charging methodology and its benefits.

Generators and consumers, matching on a half-hourly basis, would only pay for the extent of the distribution network that they use.

Photo by Radion Kutsaev.

The Eden Project

Fairer grid charges for the Eden Project

The Eden Project, a visitor attraction in Cornwall, is on the same 33kV local network group as many known existing and planned generators.

Analysis shows, by using actual metered consumption data from the trial period, that Eden Project's DUoS charge can be reduced by up to 39% or **£20,000 annually**, depending on the level of local matching that occurs. Simple rules could also be introduced to ensure Eden Project share some of this reward with the local generators.

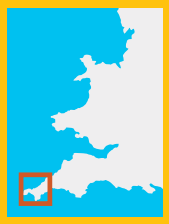


Figure: *Approximate locations of substations and generators on the same network group.*

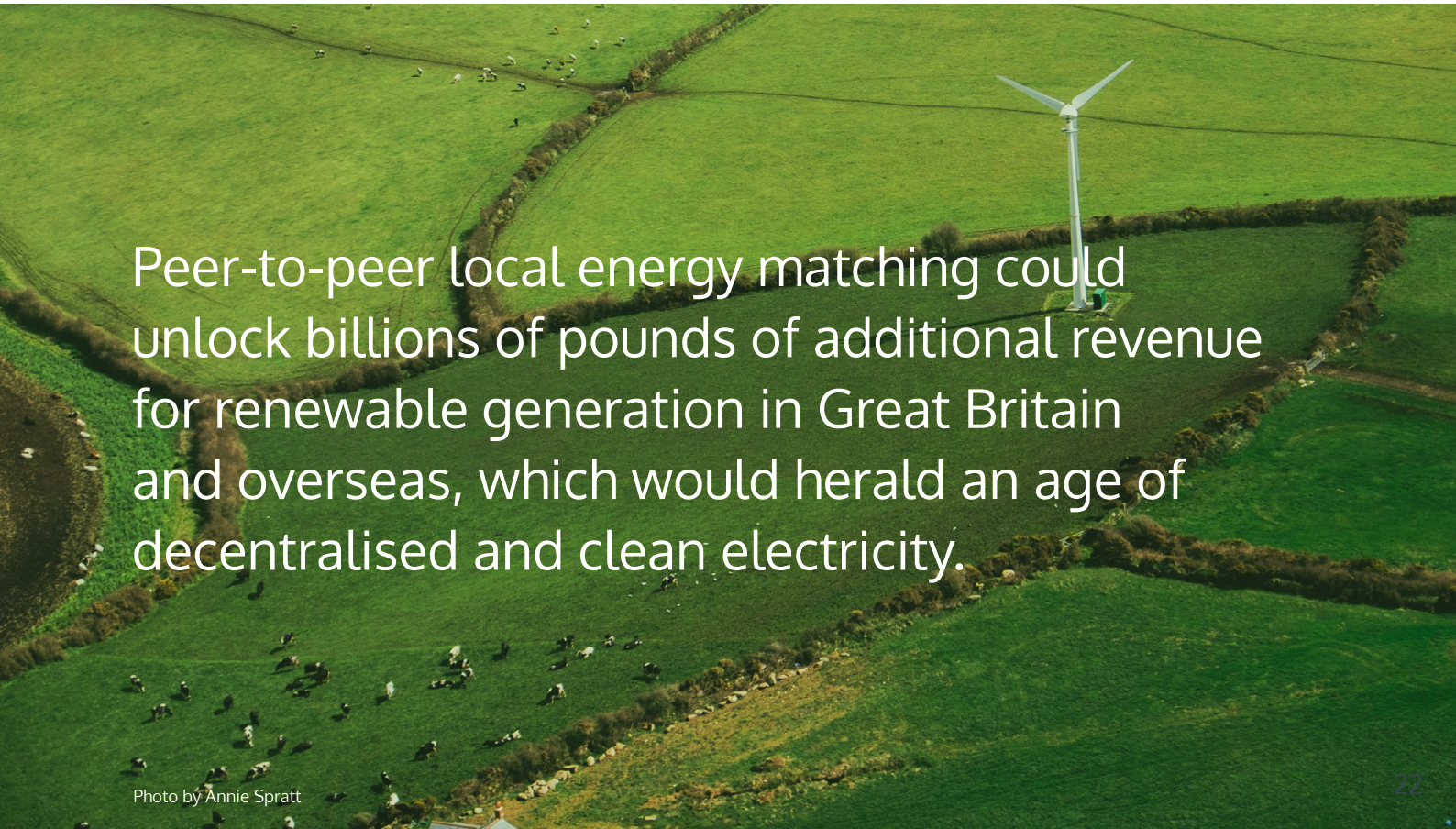
Cornwall, England

Do fairer grid charges benefit the industry?

Local matching will incentivise the industry to install generators in areas which help the grid the most, as that's where the financial reward will be highest. Meanwhile, demand-side response aggregators and energy storage providers are encouraged to balance intermittent renewables to maximise their revenue.

This leads to lower network congestion, enabling more renewable generators to connect to the grid and avoid unnecessary reinforcement costs.
Piclo is aligned with the challenges of Ofgem and DNOs trying to squeeze more capacity out of the grid.

> We want DNOs to take creative approaches to speeding up renewable connections.[5]
>
> **– Dermot Nolan, CEO Ofgem**



Peer-to-peer local energy matching could unlock billions of pounds of additional revenue for renewable generation in Great Britain and overseas, which would herald an age of decentralised and clean electricity.

Photo by Annie Spratt

Credits

Production & authoring team

Open Utility (Author)

Open Utility is an innovative energy technology company aiming to democratise energy. The digital services company is delivering step-by-step innovations that will help transform the whole energy sector.

www.openutility.com

Good Energy (Contributor)

Good Energy is a fast-growing 100 % renewable electricity supply company, offering value for money and award-winning customer service.

www.goodenergy.co.uk

Reckon LLP (Contributor)

Reckon LLP is an economics consultancy with expertise in data analysis, economic regulation and competition law.

www.reckon.co.uk

Piclo project funders

Nominet Trust

Nominet Trust is the UK's leading Tech for Good funder. The Trust believes in harnessing the power of digital technology to improve lives and communities.

A UK registered charity, Nominet Trust brings together, invests in and supports people committed to using digital technology to create social and economic value.
Nominet Trust has invested in hundreds of projects since its inception, providing business support as well as financial investment, seeking to connect projects to prospective partners who can help increase their reach and impact.

Nominet Trust is the charitable foundation of Nominet, the company responsible for running the .UK internet infrastructure. Nominet believes in the positive power of the internet, and with the money generated from the registration of web addresses ending in .uk, .org.uk, and .co.uk, Nominet is proud to be able to fund Nominet Trust's work.

Twitter: @nominettrust

Energy Entrepreneurs Fund, Department of Energy and Climate Change

The EEF is a competitive funding scheme to support the development of technologies, products and processes in energy efficiency, power generation and storage. The £35 million fund announced in April 2012 to help bring a range of new and innovative low carbon products to market. The scheme particularly aims to assist small and medium sized enterprises, including start-ups, and those companies that are selected can receive additional funding for incubation support.

Twitter: @DECCgovuk

Special thanks to the Piclo participants

- BDP
- Benson Signs
- Bromfield Quarry
- Cymric Upper & Lower Weir Import
- Ferrygate Farm Fresh Eggs
- Lancaster Co-Housing
- Sychpant Farm Import
- The Eden Project
- Watergate Bay Hotel
- Aberdulais Hydro
- Alvington Court Wind
- Benson Signs Solar
- Brixton Energy Solar
- Broadmoor Farm Solar
- Bromfield Sand & Gravel Solar
- Creathorne Solar Farm
- Cymric Upper & Lower Weir Export
- Gorran Turbines
- Hafod-y-Llan
- Hafod-y-Porth
- Hermitage Solar Farm
- Logoch Wind Farm
- Mains of Auchreddie
- Penpont Farm Solar
- Radyr Weir Hydro
- Scandale Hydro
- Shotts Golf Course Wind Turbine
- Sustainable Hockerton Wind Turbine
- Sychpant Farm Turbine
- The Olde House Solar
- Waterditch Dairy
- Westmill Solar
- Whalley Community Hydro

References

1 "Email Marketing Benchmarks" Mailchimp (22-Apr-2016), http://mailchimp.com/resources/research/email-marketing-benchmarks

2 "Community Energy Strategy: Full Report" DECC (27-Jan-2014), https://www.gov.uk/government/uploads/system/uploads/attachment_data file/275163/20140126Community_Energy_Strategy.pdf

3 "Non-traditional business models: Supporting transformative change in the energy market" OFGEM (30-Sep-2015), https://www.ofgem.gov.uk/sites/default/files/docs/2015/09/non-traditional_business_models._summary_of_responses_to_discussion_paper.pdf

4 "Electricity settlement reform – moving to half hourly settlement" Ofgem (04-Apr-2014) https://www.ofgem.gov.uk/sites/default/files/docs/2014/04/electricity_settlement_launch_statement_0.pdf

5 "Ofgem challenges power grid companies to connect more renewables" Ofgem News & Blogs (04-Mar-2016), https://www.ofgem.gov.uk/publications-and-updates/ofgem-challenges-power-grid-companies-connect-more-renewables