# How to optimise the deal an energy generator agrees with an energy supplier, now and in the future

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# Introduction

- Starting with overview of what a supplier is, how we supply our customers, how we purchase energy and what we do with energy from renewable sites.
- Then look at what can be done now to potentially increase value, and what could be done in the future.
- Matt will then talk about future projects and how they should be developed in a subsidy-free future.

# The Midcounties Co-operative

- Trace roots back to Swindon Co-operative Society and 1853
- Largest independent co-operative in the UK, with a turnover of over £1.5bn
- Operates in Energy supply, Food retail, Travel, Healthcare, Childcare, Funeral and others
- The Midcounties Co-operative has won many awards:
  - Queens Award for Sustainable Development
  - EU Renewable Energy Award Winner
  - First Fair Tax Mark reaccreditation
  - Voted ‘Co-operative of the Year’ 2015. Nominated again this year!
  - 100% score in Business in the Community’s Corporate Responsibility Index
- Parent of Co-op Energy

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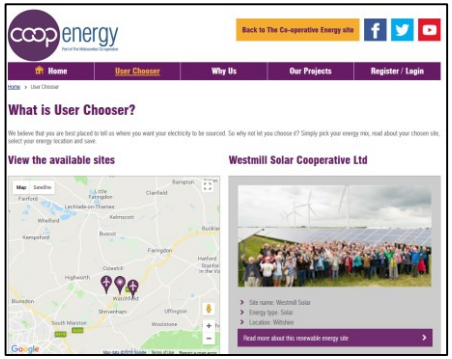
# Co-op Energy



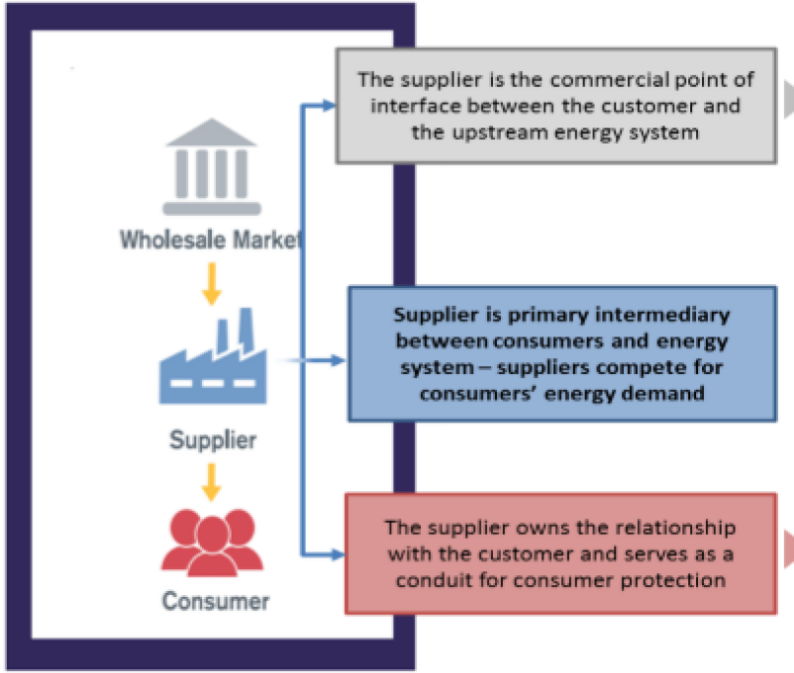

**Background**

- Nationally launched in 2011, to provide alternative to Big 6.
- Largest co-operatively run energy supplier.
- From outset, actively sought power from community generation initiatives through supporting market access via Power Purchase Agreements (PPAs)

**Today**

- Now the largest Energy Co-operative in Europe with more than 450,000 energy customers, delivering 1.8TWh electricity per annum
- 100% green electricity since April 2017.
- Took on GB Energy as Supplier of Last Resort. Purchased Flow Energy in May 2018.
- More than 500 UK staff in centres from Preston to Ipswich.
- Member customers enjoy a share of profits
- We offer our User Chooser facility to all customers:
  - allows customers to influence the energy mix of electricity they buy

# What is a Supplier?




**Cost recovery**
- Network costs
- Govt levies & policy costs
- Wholesale and SO costs

**Meeting demand**
- Procuring generation
- Managing imbalance
- Back up supplier

**Managing risks**
- Hedging
- Responsibility for settlement agents

**Metering**
- Consumption data
- Meter provision & maintenance

**Social obligations**
- Universal Service Obligation
- Vulnerability services inc PPM
- Energy efficiency

**Data & security**
- Data access & security
- Meter safety

**Customer Service**
- Billing & comms/promote engagement
- Complaints
- Smart rollout

**Market processes**
- Central systems
- Change of tenancy

**Ref: Cornwall Insight**

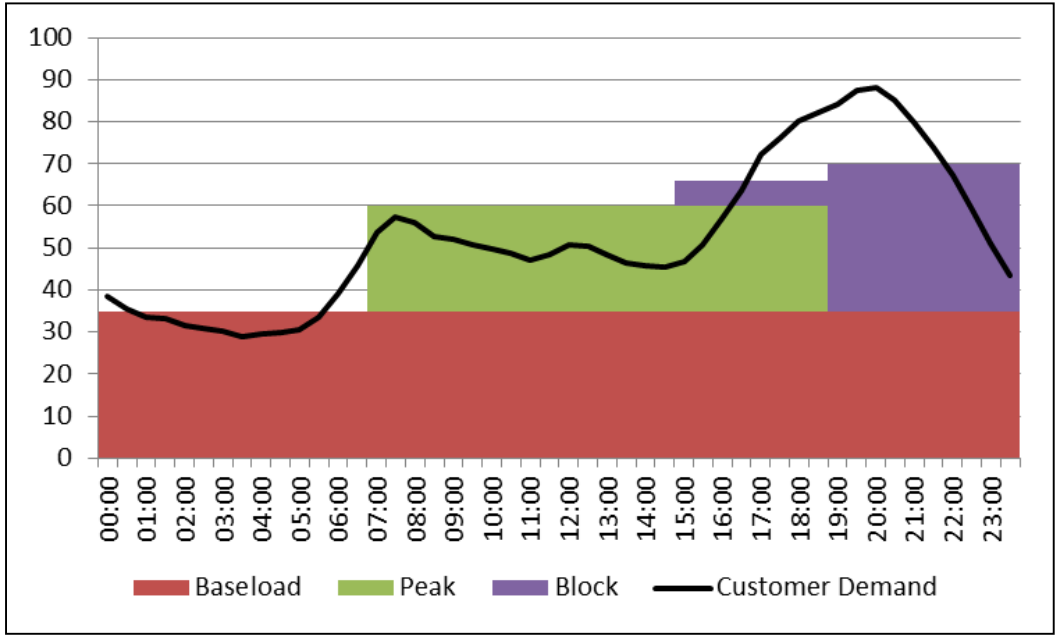
# How do we supply our customers?

- Supplied by the transmission and distribution networks
- We purchase the electricity (and gas) to match our customers usage.
- We need to forecast the **demand of our customer base**, considering:
  - Size of our customer base
  - Accurate meter readings to estimate usage
  - Climate change/Weather impact
- We also need to forecast how our **Power Purchasing Agreement (PPA) portfolio will produce**, considering:
  - Site specific power generation
  - Weather impact on power generation



# How do we purchase?

- We purchase in the following ways:
  - **Hedging** – buying energy in advance, for up to 3 years ahead.
  - **PPAs** – buying directly from the generators.
  - **Shape** – flexible product where you can buy and sell for each half hour.

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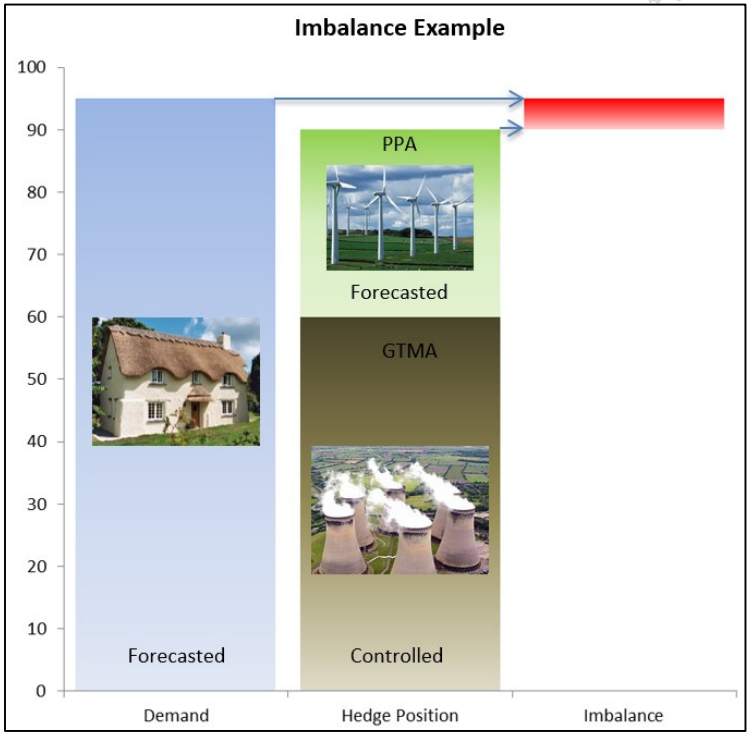
# Power Purchase Agreements

- We currently have 56 PPAs, 54 of which are with community sites.
- PPAs are treated like a hedge, in that we agree a fixed price for a long term, but it also affects shape!
- Output from PPAs go into our settlement
- We “shape” based on forecast output. If forecast is out it can be very expensive for us!
- Therefore we need to know what is happening with our sites.
- **No future Government support means the sector needs to focus on PPAs more, as they will likely be the key item which will make or break future projects**.

# Power Imbalance

- Each half hour Elexon review our position and Buy/Sell on our behalf depending on the below:
  - If we do not have enough electricity purchased they will ‘top-up’ on our behalf and retrospectively charge us.
  - If we have bought too much they will sell the excess on our behalf and retrospectively pay us for the surplus.
- Therefore getting the PPA forecast right is extremely important…

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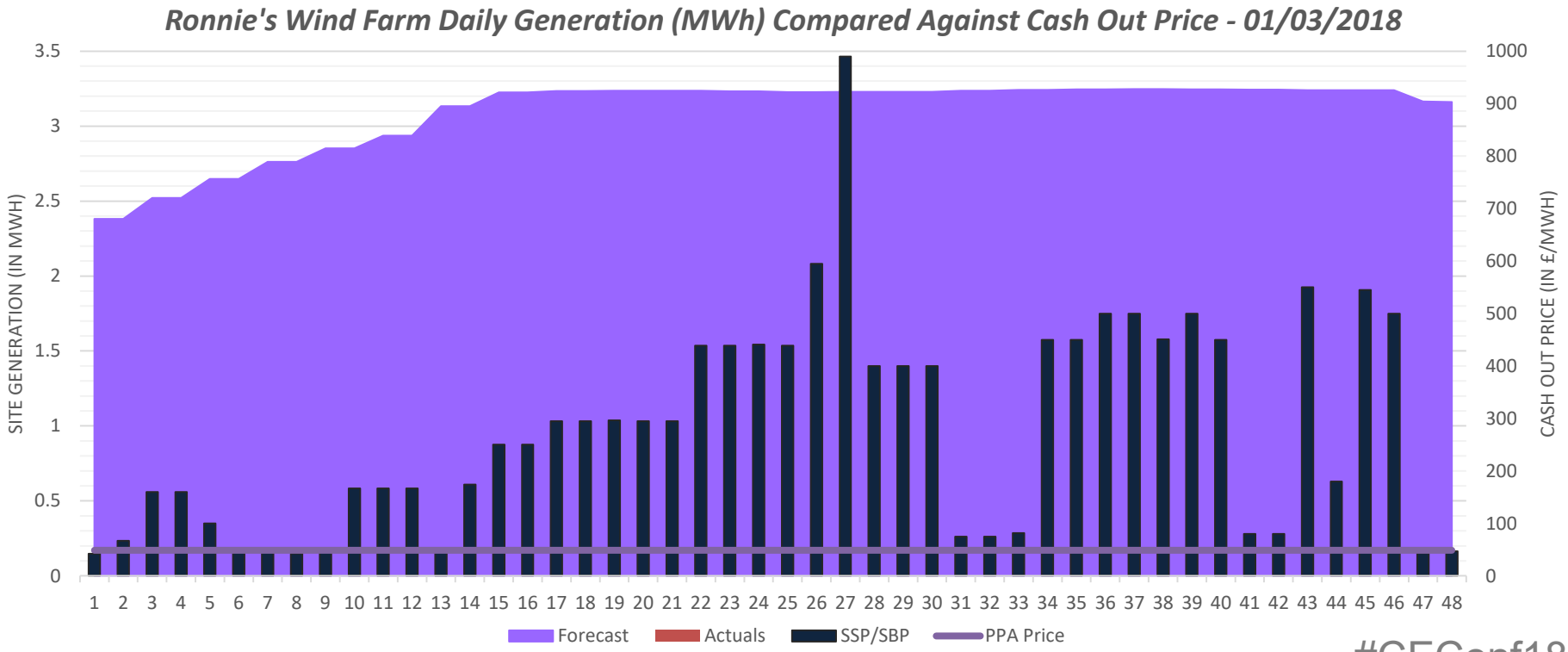
# Example of PPA forecasting error

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# Improved PPA offers

- We currently offer a pass-through of the average wholesale price across the contract term.
- The pass-through is related to how “firm” the output is, and allows for the cost of administering the portfolio.
- Guaranteed output is key!
- Making sure we receive current updates on output and accurate forecasts is very important. **Sector improvements can result in us being able to review our pass-through rate**.
- **Having “firm” prices can increase the pass-through – storage can help.**
- In a subsidy-free world you want to have set up a project to minimise the exposure from a volatile PPA market – LCOE!

# Pure Leapfrog

- Pure Leapfrog is a charity that enables communities to take power over their own clean energy future.
- Pure Leapfrog formed from the merging of two long standing organisations, PURE the Clean Planet Trust & Carbon Leapfrog.
- Leapfrog Finance is a wholly owned trading subsidiary of Pure Leapfrog.
- Leapfrog Finance was launched in September 2015 and manages a £30 million revolving loan facility to finance community-owned renewable energy assets.

# Leapfrog Finance

- It is a debt fund, able to lend up to 100% of the construction cost or acquisition costs of a community-owned renewable energy project.
- This facility was originally introduced to enable community groups to acquire and/or construct renewable energy projects under the government's Shared ownership protocol. We are currently developing a number of post subsidy models for projects across a number of technologies (rooftop & ground mounted PV, onshore wind and storage)
- We deliver social impact in several ways, not least of which is increased economic resilience in deprived areas through ownership of cash generating assets, renewable energy generation.

# What have we achieved?

- Leapfrog Finance is the leading provider of social investment to community energy projects in the UK.
- We were recognised by Community Energy England in 2017 as winners in the Community Energy Finance award category.
- Leapfrog Finance has funded 23.1MW of community owned projects, utilising £28.8m of bridging finance.

# Levelised Cost of Energy (LCOE)

- What is the LCOE?
- LCOE is a method of benchmarking project's against each other on a like for like basis.
- It compares the average total cost to construct and operate a project over its lifetime to the total energy generated by the plant over that lifetime.
- The LCOE is therefore the average minimum cost at which electricity must be sold in order to break-even over the lifetime of the project.

# Levelised Cost of Energy (LCOE)

- Courtesy of Wikipedia

$$\mathrm{LCOE} = \frac{\text{sum of costs over lifetime}}{\text{sum of electrical energy produced over lifetime}} = \frac{\sum_{t=1}^{n} \frac{I_t + M_t + F_t}{(1+r)^t}}{\sum_{t=1}^{n} \frac{E_t}{(1+r)^t}}$$

- This is the simple version and not the easiest thing to read for non-mathematicians but the principle is relatively easy to grasp.
- If you take the projected total cost of a scheme and divide that by how many units of energy are expected to be generated it gives you a £/MW or £/kW figure.

# Is my project worth doing?

- This figure is the net present value (NPV) of the unit-cost of electricity over the lifetime of your project.
- What this focuses our minds on is that by maximising the sites generation and minimising the costs where appropriate you will produce a lower LCOE.
- It is important to note though that this does not mean that the cheapest options are the best. A low LCOE is not an indicator of the quality of a project.
- This is one method to assess how economical your project will be over its lifetime.

# Post Subsidy world

- In a world without subsidies the ability of the project to generate revenue is wholly based on the PPA which governs the sale of the energy.
- Over the lifetime of a project the average PPA price you achieve will need to exceed the LCOE otherwise the project effectively doesn't cover it's own costs.

# Project Finance Modelling

- Traditional modelling practices would use the known data for a project to create a cashflow forecast.
- This data would typically include the costs of finance, construction, operation, PPA pricing, future projected power price curves, tax assumptions, inflationary assumptions etc.
- These models typically were used to create debt profiles and IRRs for projects that would indicate whether they were suitable for investment for Lenders and Equity Investors.
- Typically these models would ‘know’ what the PPA price would be.

# The Future of Modelling

- As we move towards a market with no minimum support (i.e. Feed in Tariff) it is important to evolve the modelling.
- One methodology we are developing is to reverse engineer the modelling.
- Instead of generating a cashflow profile and comparing the results against the Lender's & Investors' expectations we take the minimum baseline profile and work back from to calculate a minimum PPA price the project would require.

# The Future of Modelling

- Alternatively if the PPA price is known then you can seek for other solutions such as the maximum affordable cost of a project in terms of capital construction or operational costs.
- With marginal projects this approach can often highlight the areas of cost that have the highest impact and thus potentially negotiated further.
- As you would expect these benchmarking tools are often complex and involve large spreadsheets. I have avoided bombarding you all with large volumes of equations and numbers but am happy to talk to anyone further if you want to get in touch.



# Thanks & Contact Details

- Thanks for listening!

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