Renewable Energy On-Site Pt 2 - Sustainable Business Network, 18 May 2023

Renewable Energy On-Site Pt 2 - Agenda

- **Legal & Market Update** - Dr Wendy Buckley, Chair SBN North Hants
- **Renewables On-site** – Martin Heath, Basingstoke Energy Services Co-op
- **Living with Renewables on our Sites** – Alan Poole, Berry Bros & Rudd
- **Q&A/Panel Discussion**
- **Close**

Poll – Your Use of Renewable Energy – On Site or Not

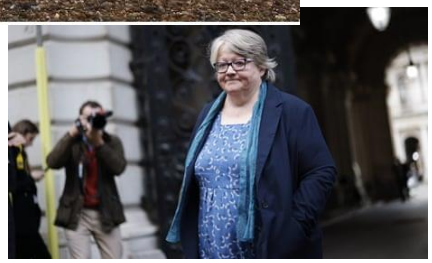
Legislation & Market Trends

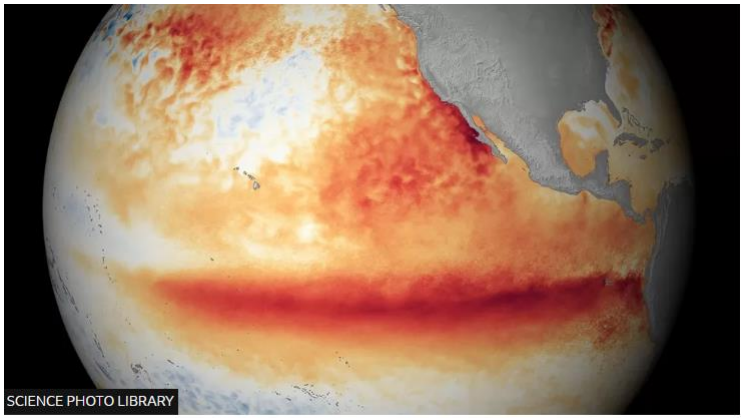
Dr Wendy Buckley
Carbon Footprint Ltd
01256 592599
Wendy.buckley@carbonfootprint.com

Sustainable Skies World Summit 2022

Water UK is ‘Sorry’

UNIVERSAL HYDROGEN'S LIGHTNING MCCLEAN COMPLETES FIRST FLIGHT ON HYDROGEN





This is how El Niño brought heat to the surface of the Pacific in 2015

Climate scientist Svitlana Krakovska stands beside the solar system she installed on the roof of her building in Kyiv.Photographer: Jula Kochetova/Bloomberg

CityLab + Green

Ukraine Is Planning Its Green Reconstruction Even as War Rages On


ACCELERATE GLOBAL PROGRESS TO
NET ZERO AVIATION


#RACETOZERO
ROLLS ROYCE


SUSTAINABLE AVIATION
EMBRAER
GKN AEROSPACE
cfm
Sustainable Skies
Panel: Sustainable Infrastructures
Moderator
Toby Gibbs, Chair Sustainability Working Group, British Aviation Group
David Hyde
Aerospace Projects Lead, World Economic Forum
Alexandre de Joybert
Sustainability Director, ACI Europe
Isaiah Cox
CEO
Wheeltug
Adam Freeman
Head of ESG & Environmental Strategy, MAG
Paul Jewell
System Development Manager, National Grid


ROLLS ROYCE
FWD FRAME RM180189
Harnessing the power of hydrogen

Climate Disclosure Reporting is Here

- **Mandatory climate related disclosure reporting (17th January 2022)**

Under the **Climate-related Financial Disclosure Regulations 2022** that apply for financial years beginning on/after **6 April 2022**, mandatory provision of climate-related information now required for publicly-quoted companies, large private companies and large LLPs.

Applies to;

- **UK registered companies with securities** admitted to AIM and Traded or banking LLPs with **more than 500 employees**.
- **UK registered companies not included** in the categories above and Large LLPs (which are not traded or banking LLPs), which have **more than 500 employees** and a turnover of more than **£500M**.

Requires companies to disclose annual reporting figures within their annual strategic reports, as well as identification of the main climate change risks to the organisation.

CSRD, ISSB, and SEC Reporting are due in July 2023

International equivalents to the **UK SECR**. Each requiring expansive sustainability disclosures, though their proposed scopes and other details vary.

ESG Framework	CSRD (EFRAG)	ISSB	SEC	SECR
Link	Corporate sustainability reporting (europa.eu)	IFRS - International Sustainability Standards Board	33-11042-fact-sheet.pdf (sec.gov)	Environmental reporting guidelines: including Streamlined Energy and Carbon Reporting requirements - GOV.UK (www.gov.uk)
Jurisdiction	EU	Global	US	UK
Topics in scope	Proposed standards span a broad list of environmental, social, and governance topics, including one dedicated to climate disclosures.	Proposed standards address climate and other sustainability risks. Additional standards are expected in the future.	Proposed rule addresses climate-related risks. A rule addressing human capital is expected in the future.	Climate-related risks and energy use.

Coming soon to **SBN**

EPR waste reporting – 'Producer Pays' Transition

- **Extended Producer Responsibility for Packaging (28 February 2022)**

Will see the **full cost of gathering and collecting household waste transfer from the taxpayer/consumer to the producers** under the The Packaging Waste (Data Reporting) (England) Regulations 2023.

Applies to;

- An individual business, subsidiary or group (but not a charity) with an **annual turnover of £1 million** or more (based on the most recent annual accounts for the company) which was responsible for **more than 25 tonnes of packaging in 2022.**

Requires the collection of additional data on household waste generated and brings the introduction of modulated fees (the payments required by eligible organisations) which will increase/decrease depending upon the recyclability of the packaging.

Plastic Packaging updates

- **Plastic Packaging Tax Regulations (1st April 2022)**

Plastic packaging tax on packaging manufactured in, or imported into the UK, that does not contain **at least 30% recycled plastic**, coming into force since **the 1st April 2022**.

Applies to;

- UK manufacturers of plastic packaging, importers of plastic packaging, and the business customers of manufacturers and importers of plastic packaging who manufacture or import **more than 10 tonnes of packaging within a 1-year period**

Requires all eligible organisations to pay packaging tax. This is currently charged at a rate of **£200 per tonne of waste**.

Credit - Dell

Retained EU Law Ditched for new List

- **Retained EU Law (Revocation and Reform) Bill 2022 – update (10th May 2023)**

- Deadline of 31st December 2023 to scrap Retained EU legislation and to automatically expire all EU-derived legislation has been ditched by UK Government.
- The 2023 Bill including the sunset clause is to be replaced by **a list of 600 pieces of legislation** that the Government aims to replace by the end of 2023.
- This change would be made by amending the Bill when it returns to Parliament next week.

For more information on list of EU laws intended to be revoked see; Schedule of retained EU law - GOV.UK (www.gov.uk)

Net Zero (SBTI) – Urgent need for Beyond Value Chain Mitigation aka Offsetting

- **Beyond Value Chain Mitigation means offsetting**
- Actions that reduce global emissions – typically by decarbonising grids (solar, windpower etc)
- SBTI clear that without this we not meet global targets
- Dates from **13 September 2022**.
- Do this as part of your net zero programme – **won't be able to 'net it off' your footprint** but without it, your target may not be reachable
- **SBTI is not *'anti reductions offsetting'***

[Net-Zero: Urgent Beyond Value Chain Mitigation Is Essential - Science Based Targets]

BEYOND VALUE CHAIN MITIGATION

Companies must scale up investment to get the global economy on track to halve emissions by 2030 and achieve net-zero by 2050. The SBTi is developing guidance to support companies to go beyond their science-based targets by channeling additional climate finance towards

Water Companies Continue to Get High Fines…

- **Anglian Water fined £2.65 million** after allowing **millions of litres of untreated sewage** to overflow **into the North Sea**.
  - An investigation in 2018 found that the discharges into the North Sea between June and July 2018
  - Approx 7,500,000 litres of raw sewage discharged into North Sea
  - Record fine for the area.

- **South West Water fined £2.1 million** for a series of offences which resulted in environmental damage and pollution of rivers and a lake across both **Devon and Cornwall**
  - Fined for various (13) pollution incidents across Devon and Cornwall area over a period of four years.
  - One discharge lasted for over 35 hours and samples taken from a stream at the beach showed E. coli levels to be 2,000 times higher than the level that would be classified as poor.
  - £2.1 million fine
  - £280,000 in costs
  - £170 victim surcharge

- The Government has also published a Consultation which aims to strengthen the abilities of the Environment Agency to issue monetary penalties for environmental offences in England, and to raise the cap for such penalties.

References / Useful Links

- https://www.theguardian.com/environment/2023/apr/28/e-coli-levels-suffolk-river-therese-coffey-constituency-far-above-legal-limits-data-shows
- Ukraine Green Rebuilding Focuses on Clean Energy, Climate Action - Bloomberg
- Sustainable Skies World Summit 2022 | Farnborough International
- ZeroAvia | Alaska Airlines | World's Largest Zero-Emission Aircraft Development
- Leasing Group Monte Agrees to Purchase Eviation Alice Electric Aircraft | FutureFlight
- Government aims to increase environmental fines (cedrec.com)
- Mandatory climate-related financial disclosures by publicly quoted companies, large private companies and LLPs (publishing.service.gov.uk)
- Deadline to scrap Retained EU legislation ditched by UK Government (cedrec.com)
- Net-Zero: Urgent Beyond Value Chain Mitigation Is Essential - Science Based Targets
- Corporate sustainability reporting (europa.eu)
- IFRS - International Sustainability Standards Board
- https://www.sec.gov/files/33-11042-fact-sheet.pdf

Poll Results Time

Renewable Energy On-Site Pt 2 - Agenda

- **Legal & Market Update** - Dr Wendy Buckley, Chair SBN North Hants
- **Renewables On-site** – Martin Heath, Basingstoke Energy Services Co-op
- **Living with Renewables on our Sites** – Alan Poole, Berry Bros & Rudd
- **Q&A/Panel Discussion**
- **Close**

Why should I invest in solar PV and batteries (Part 2)?

North Hants Sustainable Business Network 18th May 2023

Martin Heath

07771 805000
Martin.heath@bes.coop

Basingstoke Energy Services Co-op
"For the benefit of our customers"

Sustainable Business Network
North Hampshire

Basingstoke Energy Services Co-op
"For the benefit of our customers"

A reminder of what we concluded in Part 1

- Find a good roof (orientation, pitch, age, material).
- Check how and when you use electricity (match with PV generation).
- Survey internal electrical distribution system (is it good enough).
- Optimise size of solar PV against electricity use patterns.
- Work out the “hard” business case (yields, self-use, revenues, savings and costs)
- Work out the “softer” benefits (Emissions reductions, benefits to employees, wider community, suppliers). A powerful and visible statement
- The value is in the design and optimisation not in the installation
- **THE POTENTIAL BENEFITS ARE HUGE**

You can watch again here

https://youtu.be/JDyX3zyfIZI

Basingstoke Energy Services Co-op
“For the benefit of our customers”

So what do we want to cover today?

So I now have decided to get PV (or I already have it), should I invest in batteries as well?

Three areas

- **Types of battery**
- **How should I use them**
- **A case study**

Take aways

- **It's much more complex than solar PV alone**
- **Lots of types of technology**
- **Need to balance load, generation and consumption**
- **Monitoring and control are vital**
- **Batteries work; but not always**
- **Understand why you want batteries**
- **There are 2 modes of use – winter and summer**

But today is focussing on storing (time shifting) electricity generation and use in small scale batteries.

Basingstoke Energy Services Co-op
"For the benefit of our customers"

Who are we? Founded in 2012

HAMPSHIRE RENEWABLE ENERGY CO-OPERATIVE

PETER SYMONDS FOUNDER 1607 CHRISTES HOSPITALL

MaidEnergy
CLEAN ENERGY
LOCALLY OWNED

LFB
LONDON FIRE BRIGADE

Basingstoke Energy Services Co-op
"For the benefit of our customers"

BASINGSTOKE COLLEGE of TECHNOLOGY BCoT

RIDING SUNBEAMS

CHAMPION BUILD

Wight Community Energy

Basingstoke Energy Services Co-op
"For the benefit of our customers"

What have we done so far?









Why do I need a battery?

1. To store surplus generated electricity for later use (4-8 hour time shift)
2. To capture cheap overnight electricity to use the following day (12-18 hour time shift)
3. To provide back-up during outages
4. To provide grid services – peak shaving, grid stability, short term operating reserve, fast frequency response……

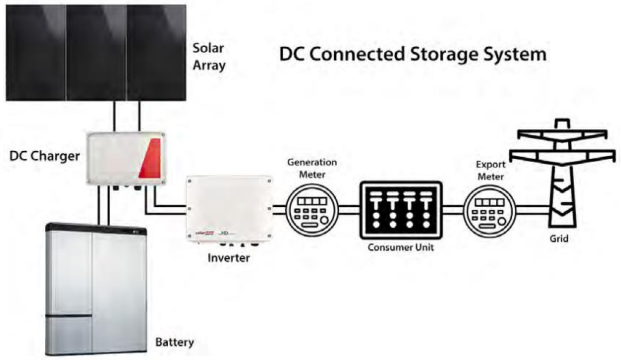
Today is about 1,2 and 3 only. Grid services are a complex area and only really suitable for grid scale operations eg > 0.5MW, 0.5MWh

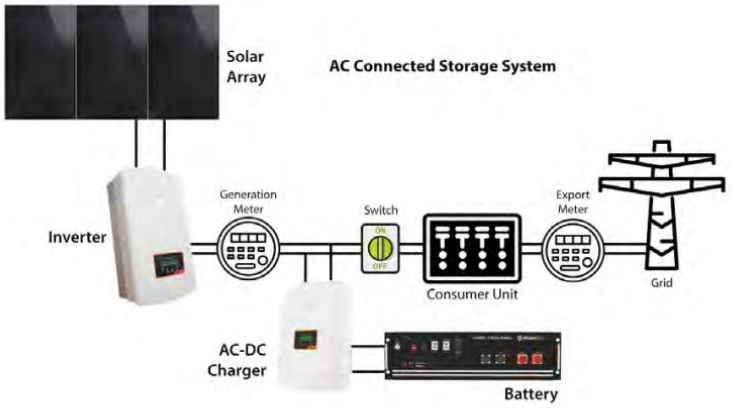
5kW, 14kWh NOT 2MW, 4MWh

Basingstoke Energy Services Co-op
"For the benefit of our customers"

Types of battery

AC or DC Coupled or hybrid





Chemistry – Many types eg

Salt water flow

Lead-Acid

Lithium Ion

Lithium Iron Phosphate

All vary in terms of energy density, storage times, charge and discharge rates, costs, lifetime

$LiFePO_4$ is, currently, the favoured chemistry for small to mid-scale applications

Basingstoke Energy Services Co-op
"For the benefit of our customers"

What do they look like?

14.4 kWh/6kW

10.66kWh/4kW

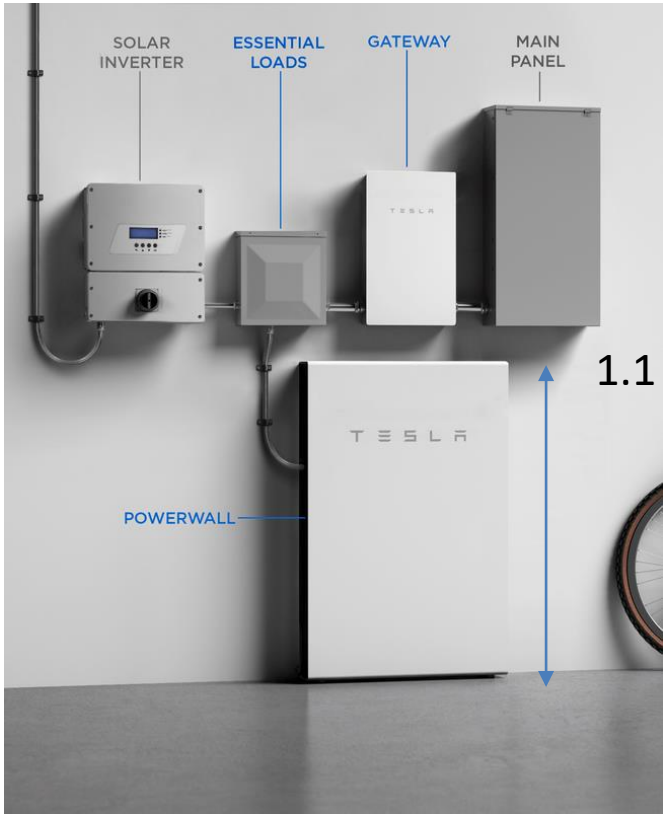
13.5kWh/5kW

Basingstoke Energy Services Co-op
"For the benefit of our customers"

What do they look like?

2.4 meters

100kWh/50kW



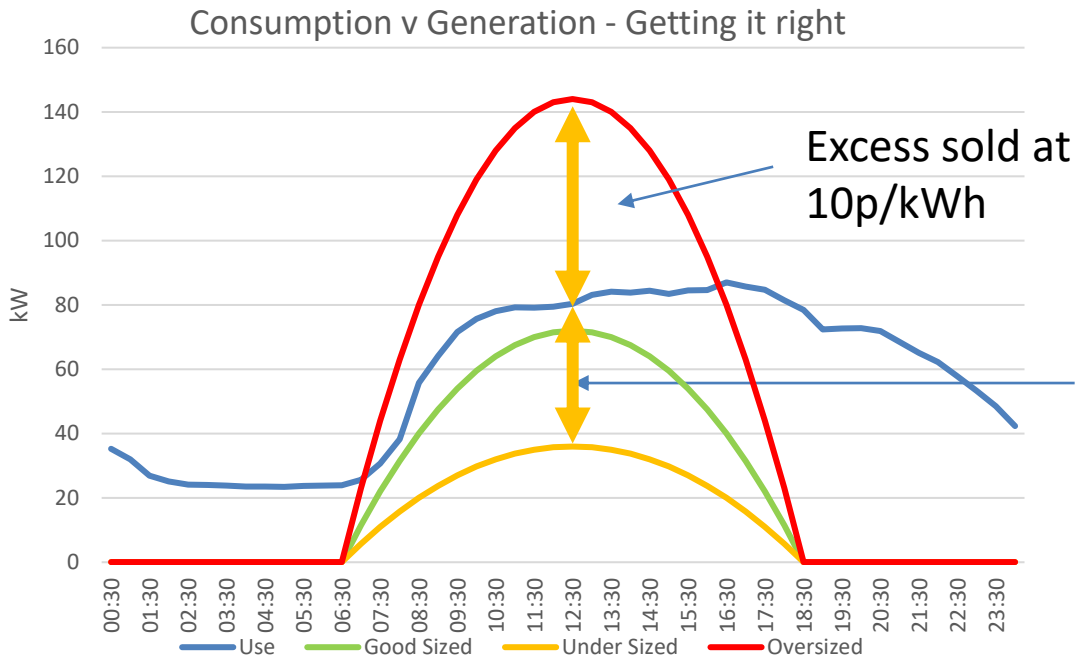
1.1 meters

13.5kWh/5kW

But all are scalable eg
4 x 13.5kWh Tesla powerwalls
20 x 100kW kStar

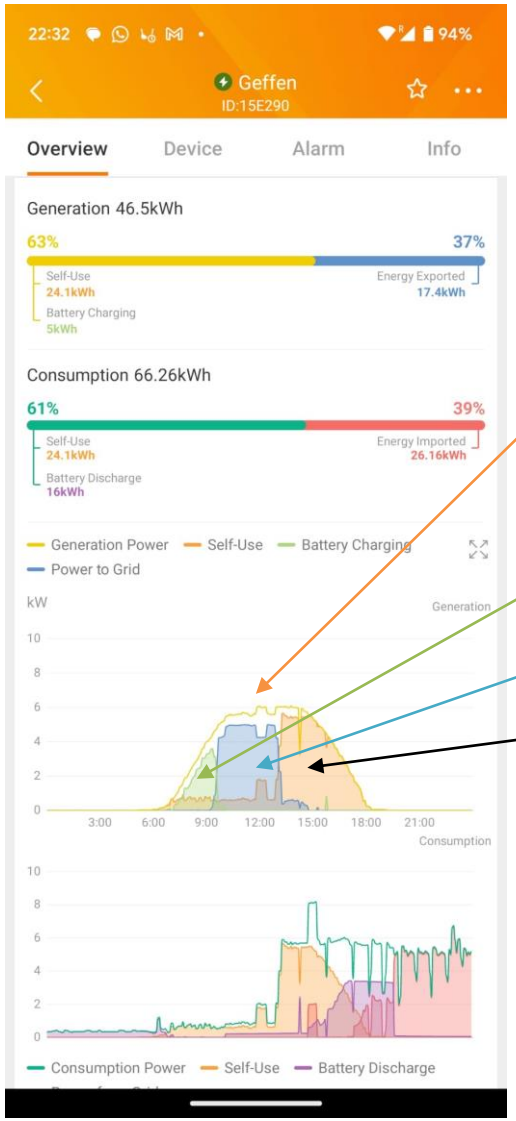
Basingstoke Energy Services Co-op
"For the benefit of our customers"

Two modes of use – 1. capturing excess solar PV generation during the summer



Lost opportunity to save electricity costs at 33p/kWh

Getting battery sizing right is a balancing act of load, generation and charge rate. Monitoring and control is vital.



Solar PV peaking at 6kW

4kWh battery fully charged by 11am

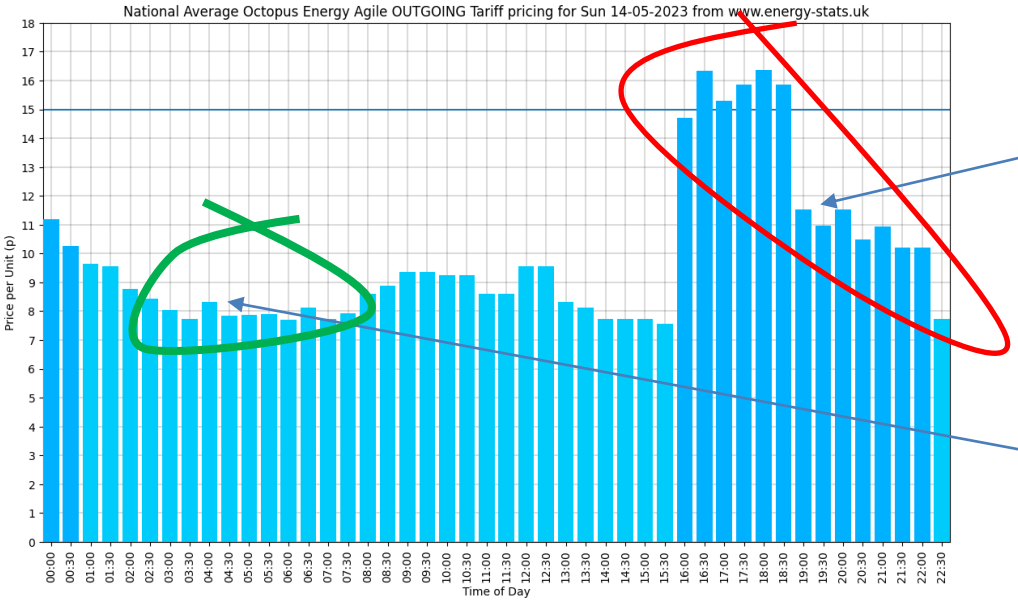
Export to the grid resumed

Heat pump for swimming pool switched on and EV plugged in

Loads need to be prioritised – house, battery, EV, heat pumps ie usage first storage 2nd.

Basingstoke Energy Services Co-op
"For the benefit of our customers"

Two modes of use – 2. Overnight charging, aka arbitrage, during the winter



Use then

Charge here

Points to note

1. Inverter size determines charge rate
2. Battery size determines total energy stored (and charge rate)
3. Trick is to fill the battery in 4 hours or less overnight
4. Inverter and battery size determines discharge rate
5. Size the battery/inverter for expected consumption (kWh) and power (kW) during the evening peak so it is empty by start of next charging period

Basingstoke Energy Services Co-op
"For the benefit of our customers"

What makes a good investment?

Six key factors:

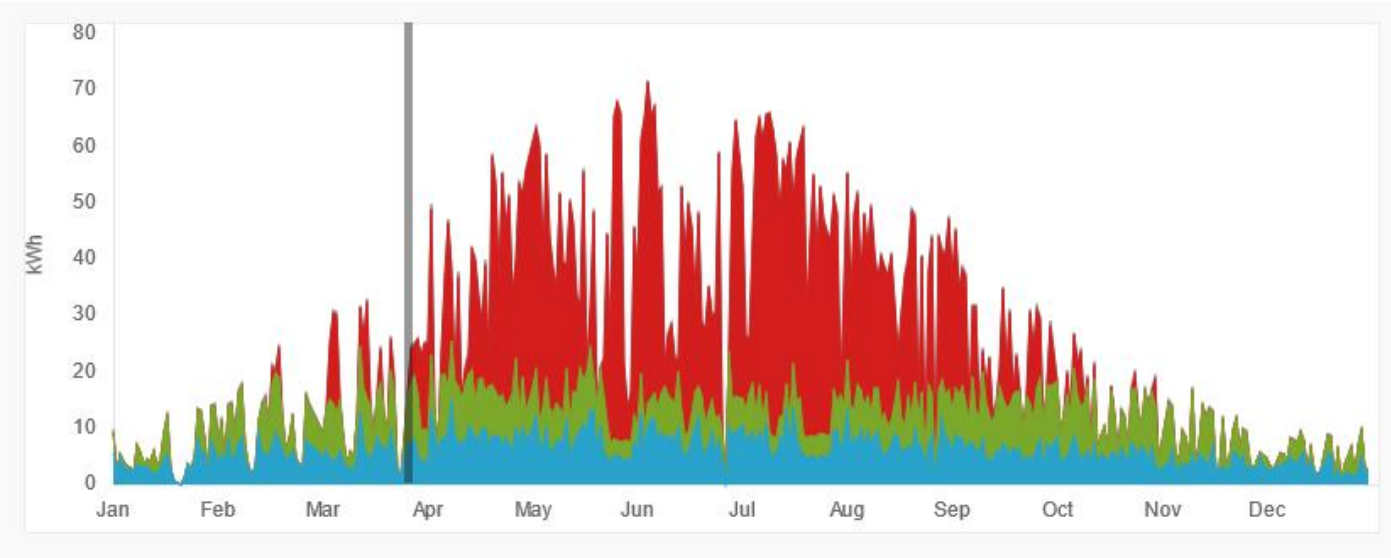
Install Cost (£/kWh and £/kW)
On-site use (%) and load patterns
Size in terms of capacity (kWh) and charge/discharge rate (kW)
Electricity Price (£/kWh) – how much can I save; at what price can I buy
Depth of discharge/usable capacity
Zero VAT if installed with solar PV

A Case study
SME or large home
10kW Solar PV (24 degrees from south, 35 degrees pitch)
11.6kWh battery (10.4kWh usable)
7.5kW hybrid inverter

6,000 kWh a year consumption
9,000 kWh a year generation
Cost of install £16,500 (zero VAT)

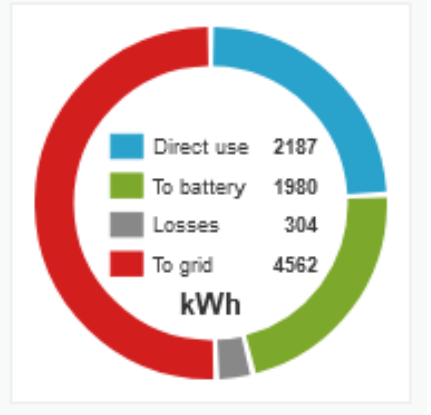
Basingstoke Energy Services Co-op
"For the benefit of our customers"

A case study….



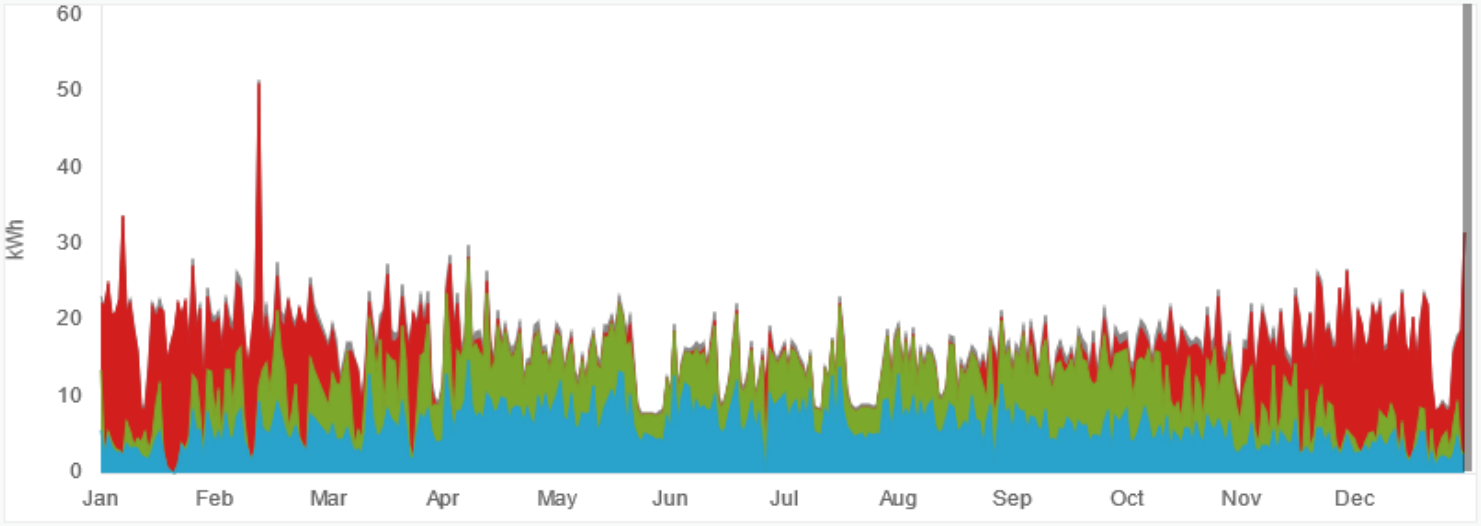
Example solar PV -
21 panels
Tiled roof
Approx cost £16.5k (ex VAT)

Generation
9,003 kWh
49% self use
25% via battery
51% to grid

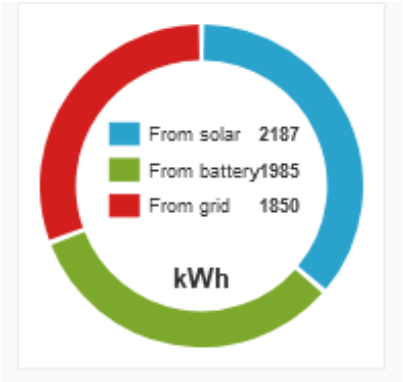


Basingstoke Energy Services Co-op
"For the benefit of our customers"

A case study….

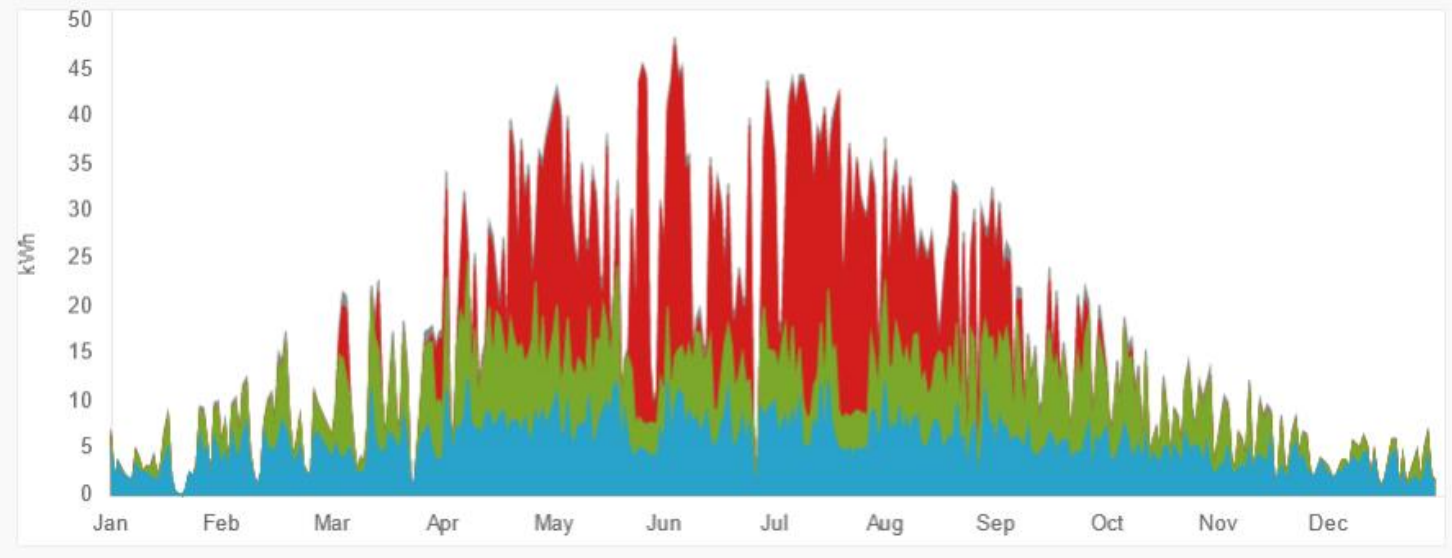


Consumption
6,000kWh
36% from solar
33% from battery
31% to grid



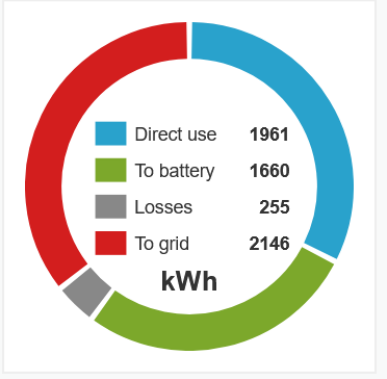
Basingstoke Energy Services Co-op
"For the benefit of our customers"

A case study, smaller system



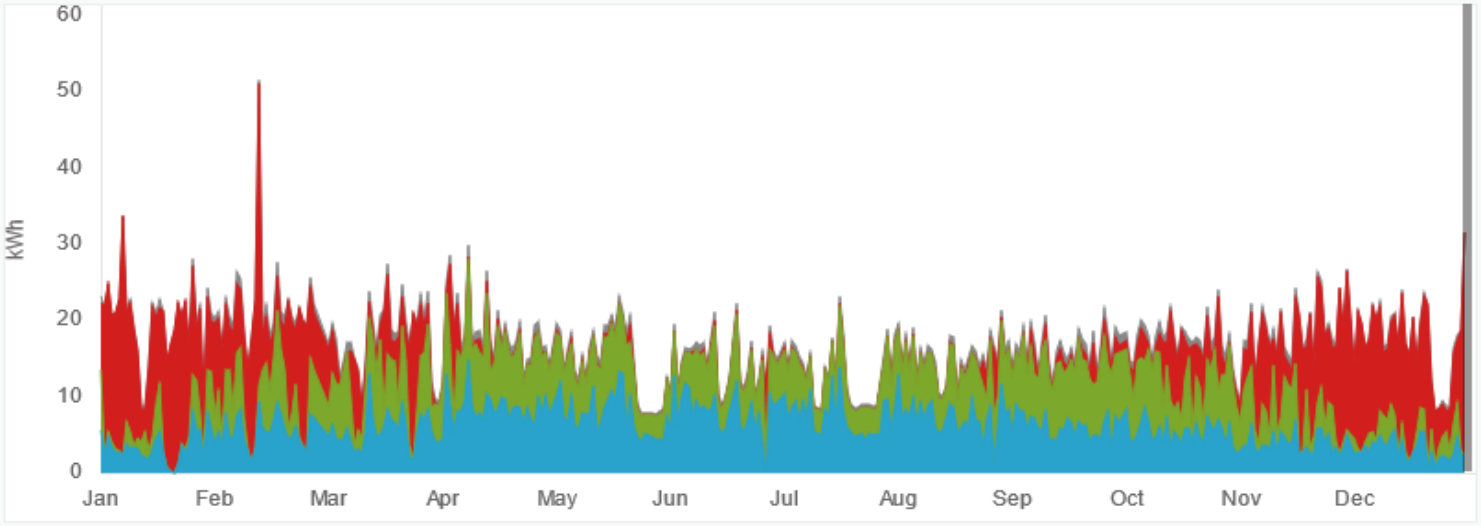
Example solar PV -
14 panels
Tiled roof
Approx cost £13.5k (ex VAT)

Generation
6,002 kWh
64% self use
31% via battery
36% to grid

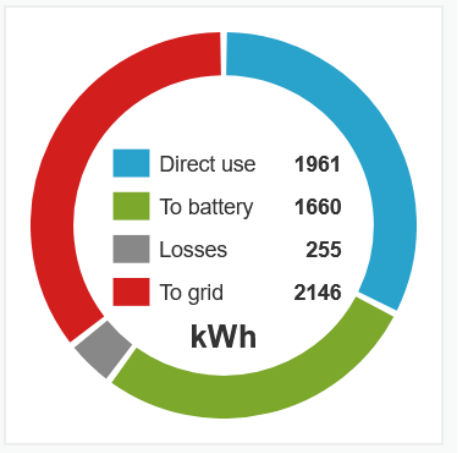


Basingstoke Energy Services Co-op
"For the benefit of our customers"

A case study, smaller system



Consumption
6,000kWh
36% from solar
33% from battery
31% to grid



Basingstoke Energy Services Co-op
"For the benefit of our customers"

So what do we want to cover today?

So I now have decided to get PV (or I already have it), should I invest in batteries as well?

Three areas

- **Types of battery**
- **How should I use them**
- **A case study**

Take aways

- **It's much more complex than solar PV alone**
- **Lots of types of technology**
- **Need to balance load, generation and consumption**
- **Monitoring and control are vital**
- **Batteries work; but not always**
- **Understand why you want batteries**
- **There are 2 modes of use – winter and summer**

Basingstoke Energy Services Co-op
"For the benefit of our customers"

Questions?

Basingstoke Energy Services Co-op
"For the benefit of our customers"

BY APPOINTMENT TO
H.M THE QUEEN
WINE & SPIRIT MERCHANTS
LONDON

BY APPOINTMENT TO
H.R.H THE PRINCE OF WALES
WINE & SPIRIT MERCHANTS
LONDON

BERRY BROS & RUDD

3, ST. JAMES'S STREET, LONDON

WINE & SPIRIT MERCHANTS

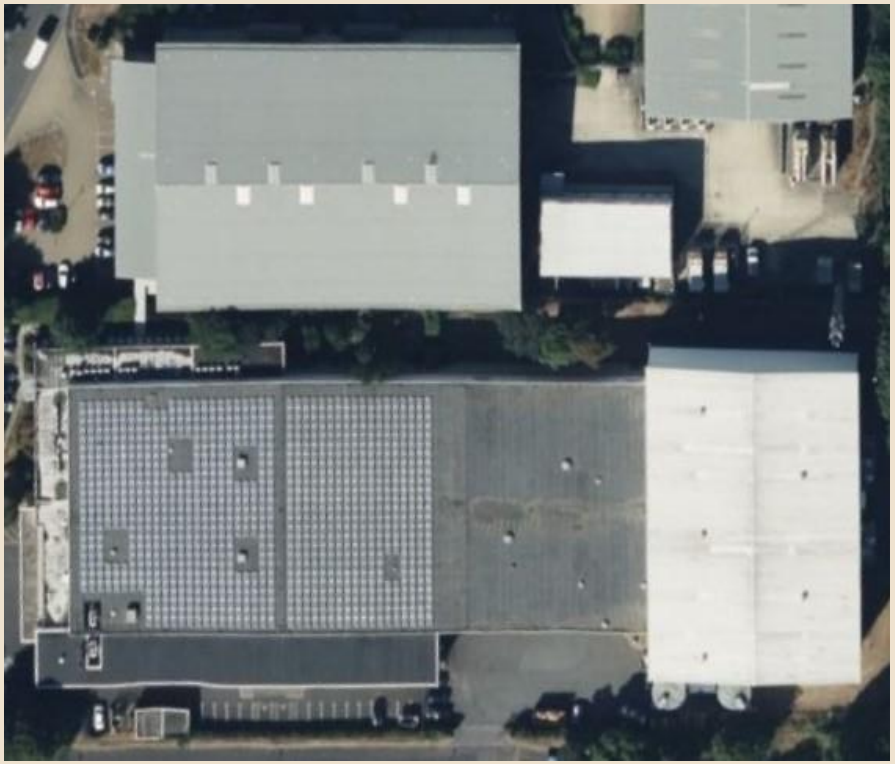
Living with Renewables in our Business

Sustainable Business Network

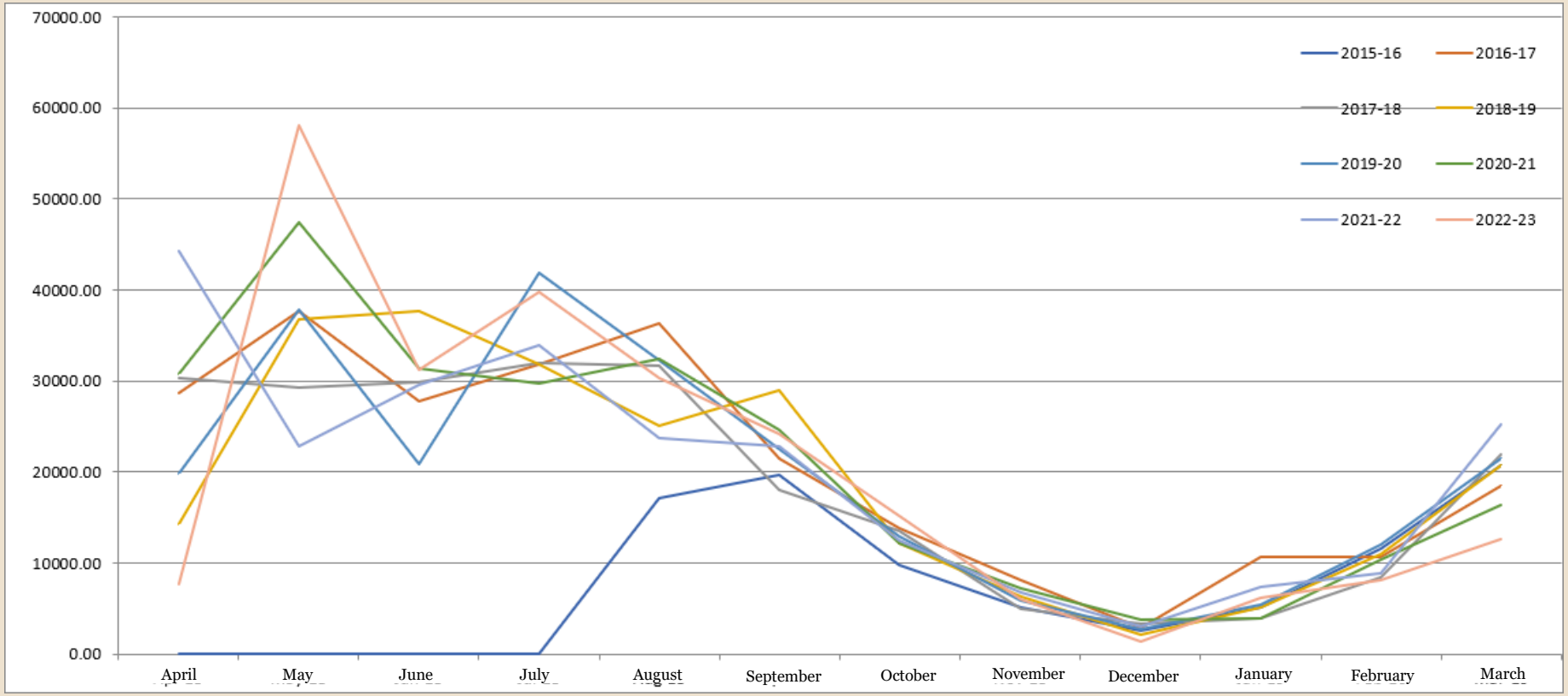
Basingstoke Solar Panels

Basingstoke Solar Panels

Solar Array at our Basingstoke site 250Kw system, installed July 2015 this went live in August and has produced 1790289 KwH which equal one third of our annual usage.
This is all used on site and helps maintain our temperature control target of 12 degrees C



Basingstoke Solar Panel Data

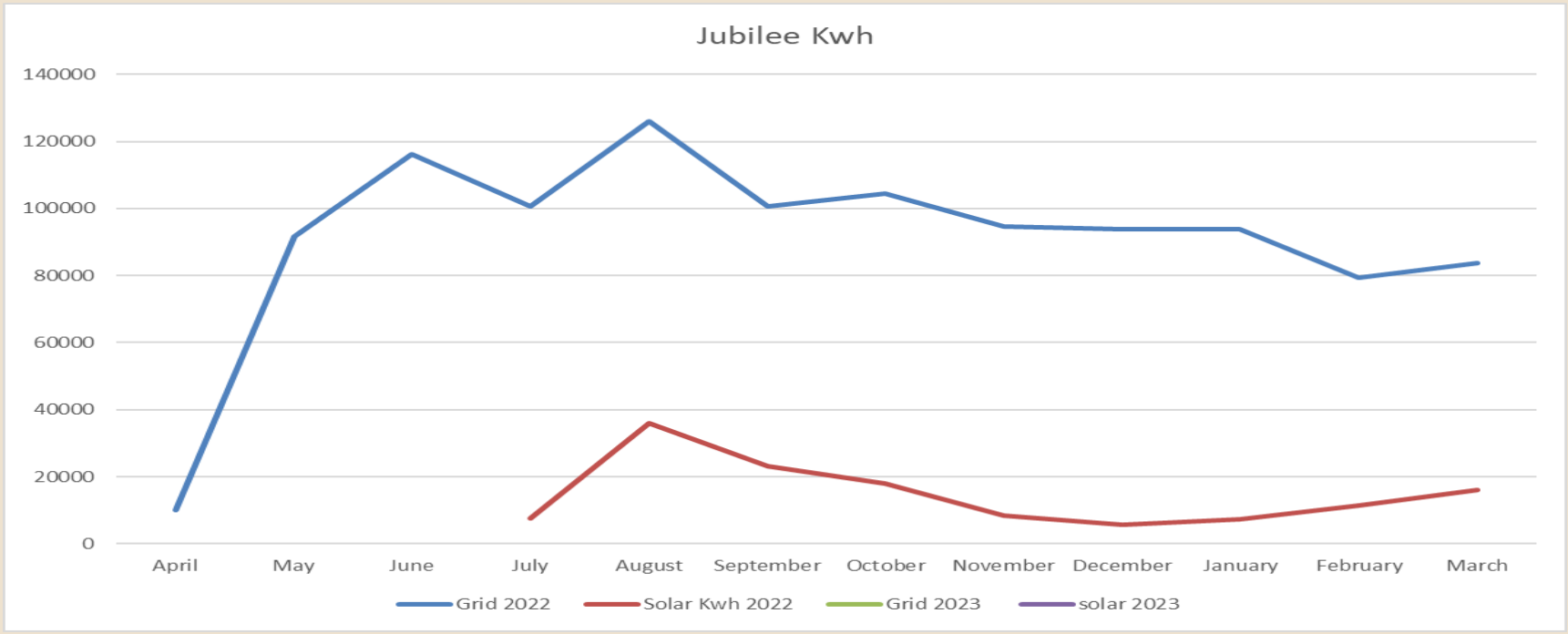


Solar production by year, this shows the vagaries of the British weather, but generally follows a seasonal curve

System notes

- 2015 Installation which has produced 1/3 of our energy annually
- Low maintenance cleaned every two years to maximise panel efficiency.
- Building is 56 years old and has and A rated EPC

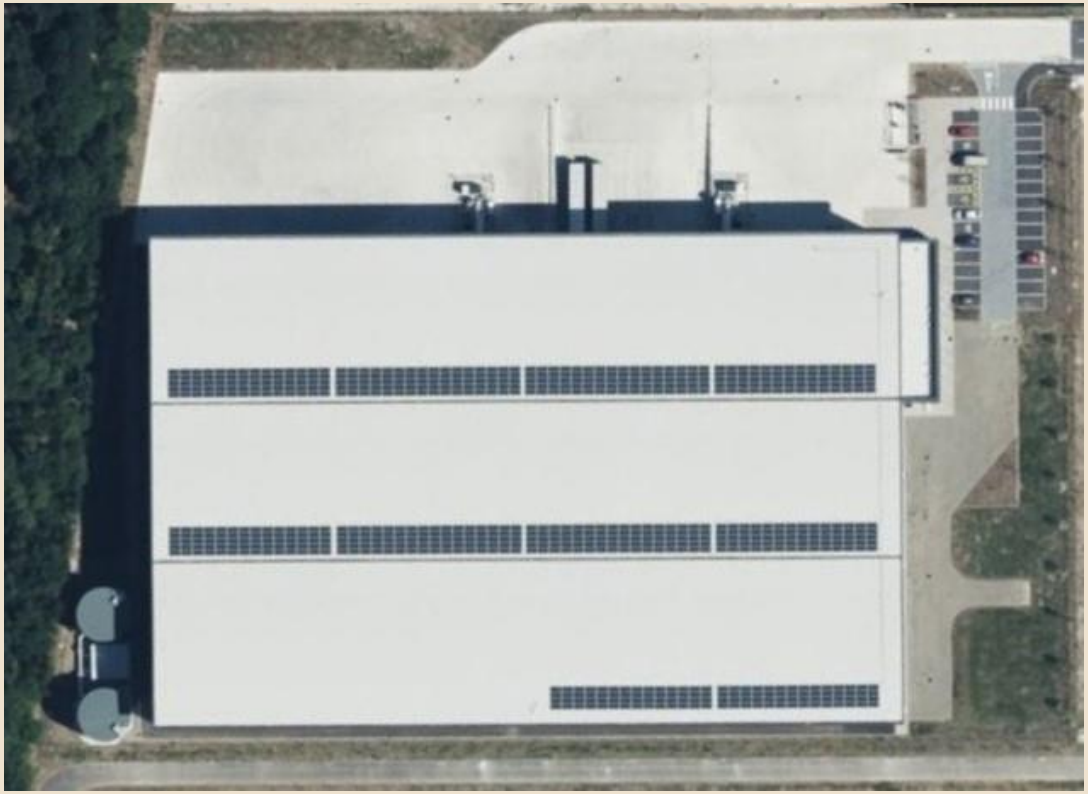
Jubilee Solar & Grid Data



200 KwH system at Jubilee site graph shows energy from grid and solar generation, on average we produce 40% of our energy annually

Point to note is that as the warehouse has filled up energy costs have fallen as the thermal mass of the stock helps keep the space cool.

Jubilee Solar Panels



Overhead view of panels. We hope to increase these once plans for the grid upgrade are completed.

22 May 2023

Solar farm as our next door neighbour.

22 May 2023

System Notes

- 2022 Installation which has produced 40% of our energy annually
- We hope to install enough panels to be 100% self sufficient over a 12 month period.
- Site is the largest fine wine storage unit in the UK
- BB&R celebrate 325 years as a business this year

BY APPOINTMENT TO
H.M THE QUEEN
WINE & SPIRIT MERCHANTS
LONDON

BY APPOINTMENT TO
H.R.H THE PRINCE OF WALES
WINE & SPIRIT MERCHANTS
LONDON

BERRY BROS & RUDD

3, ST. JAMES'S STREET, LONDON

WINE & SPIRIT MERCHANTS

Thank-you & More SBN

SUSTAINABLE BUSINESS NETWORK VIDEOS

Full recordings from our latest events

More information

More information

More information

More information

More information

More information

carbonfootprint.com - Sustainable Business Network Videos