



# TEWKESBURY BOROUGH COUNCIL SOLAR PV CANOPY PROJECT

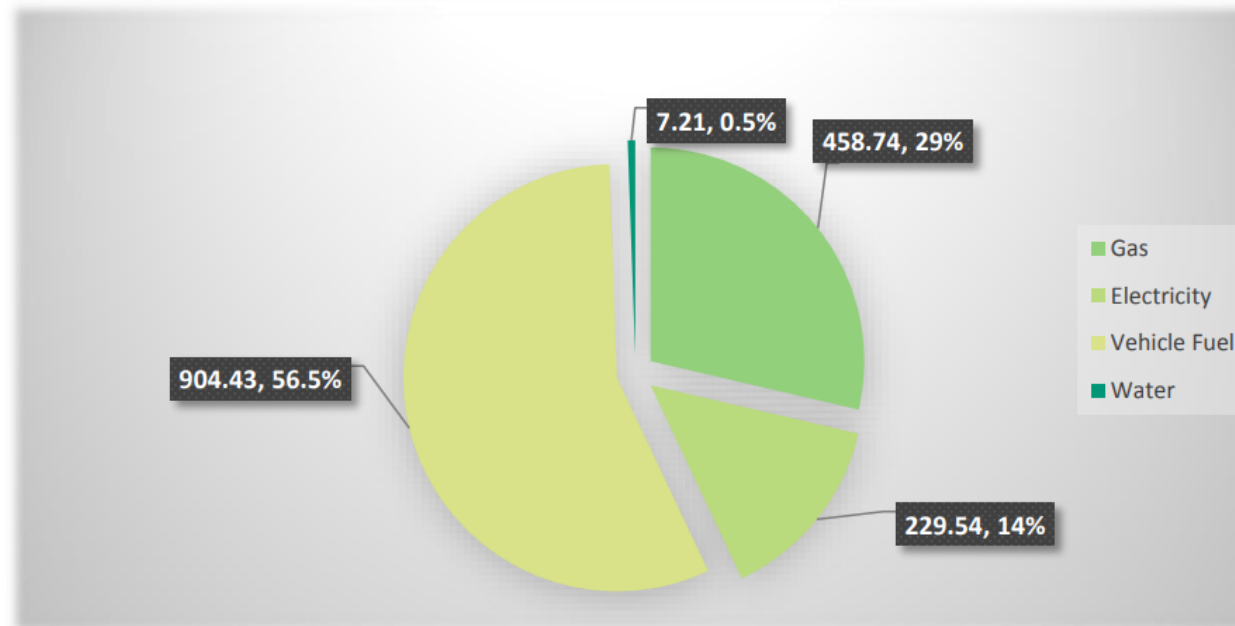
CHRISTOPHER ATKINSON  
17<sup>TH</sup> OCTOBER 2023



# Background

- ▶ Tewkesbury Borough Council declared a **Climate Emergency** in October 2019 and has committed to having **Carbon Neutral offices by 2030**
- ▶ In May 2023 this was extended to an **Ecological and Borough Wide Climate Emergency**
- ▶ We are a member of **Climate Leadership Gloucestershire**
- ▶ We first measured the Council's **Greenhouse Gas Emissions** in 2019, giving a benchmark of **1,600 tonnes**.
- ▶ A **Carbon Reduction Programme** was initiated for our Carbon Neutral journey.

*Figure 1: Emissions by Source – Tonnes CO<sub>2</sub>e, Percentage of Total*



# Carbon Neutral 2030 Activities

- ▶ Tewkesbury Borough Council declared a **Climate Emergency** at full council on 1<sup>st</sup> October 2019. The Council has committed to becoming carbon neutral by 2030 and have developed a **Carbon Reduction Programme**
- ▶ **Energy, Water & Waste** - In addition to the Solar PV, energy efficiency Improvements such as LED Lighting, timers on equipment, better heating and water controls have and are being implemented together with insulation and double glazing on the Council's own domestic properties. We are looking at our internal waste and how we can reduce this.
- ▶ **Transport** - The Council has converted two out of four pool cars to electric, utilizing the electric vehicle charging infrastructure on site. The feasibility of further electric vehicle charging points in the Borough is being explored
- ▶ **Biodiversity** - Tree planting activity has been undertaken on the Council's land and we are working with Gloucestershire County Council to identify further opportunities to support carbon capture through nature.
- ▶ **Communications & Engagement** - The Council's own website is being updated to say how the Council's is addressing Climate Change. Carbon Literacy training and support is being offered to staff and members.
- ▶ **Borough Wide Carbon Reduction** - Having looked at the Council's own Carbon footprint the next steps will be to help residents, businesses, community groups and other organisations to tackle emissions across the Borough.



carbon  
neutral  
2030

**Carbon Literate  
Organisation**  
Bronze



**Tewkesbury  
Borough Council**

# Funding Application Journey and Project Delivery

- ▶ Inhouse decarbonisation feasibility and options completed for the replacement of aging gas fired heating system together with a Ground Source Heat Pump funding application (Dec 20)
- ▶ £21,700 grant from BEIS, Low Carbon Skills Fund for detailed Feasibility study.
- ▶ PSDS1 grant funding agreed for £284k based on a Ground Source Heat Pump estimated at £650k however feasibility findings recommended an Air Source Heat Pump, a funding change request was submitted and agreed. (May 21)
- ▶ Detail design, tender of the Air Source Heat Pump completed. (Aug 21) However tender returns were significantly higher than anticipated making it financially unviable
- ▶ Renegotiation with Salix led to the agreement to use the fund to provide a Solar PV canopy at the Council Offices meeting the original Carbon Funding criteria along with Council Members approval to support the new scheme (Dec 21)
- ▶ Detailed designs and a planning application were submitted, and procurement routes were investigated to meet the March 2022 deadline for completion.
- ▶ Further submission for funding extension agreed for June 22 Completion
- ▶ Tender awarded April 22, site mobilisation May 22
- ▶ Substantial completion June 2022

# Solar Canopy Energy Consumption

A pre-assessment of Solar Canopy impact against TBC office electricity demand

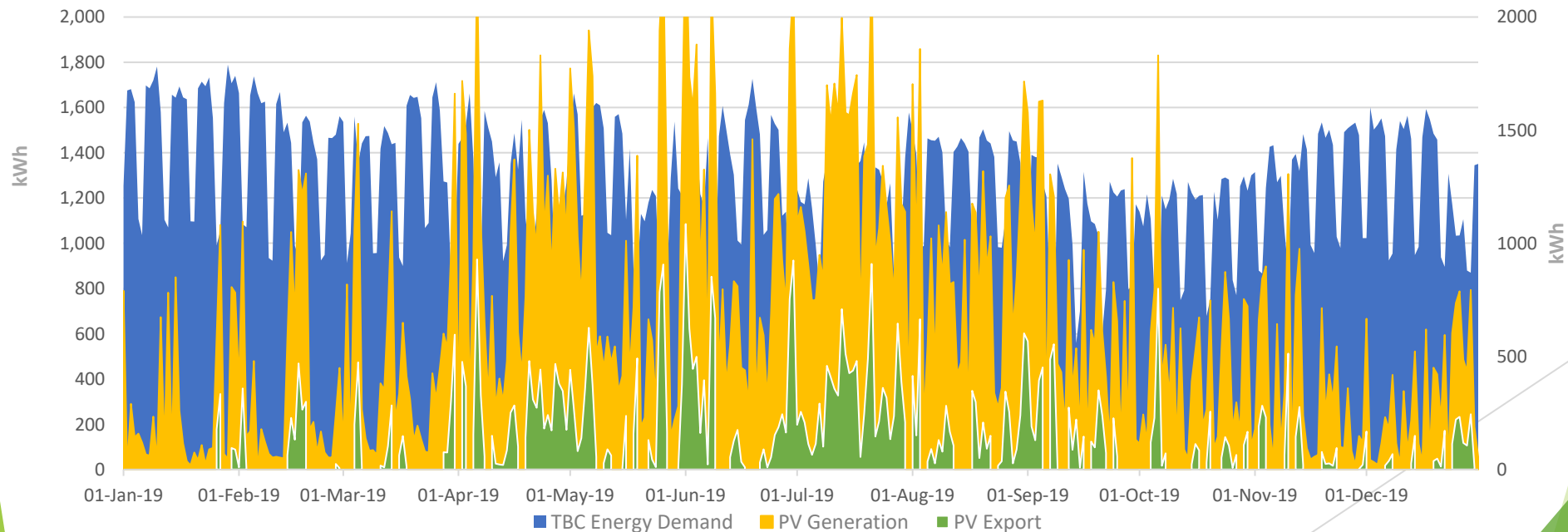
(based on 2019 consumption)



carbon  
neutral  
2030

- i. We can make use of nearly 80% of the estimated 250,000kWh generated p.a.
- ii. By splitting the generation with the leisure centre we can maximise use of the electricity and avoid exporting to the grid.

Daily PV Generation against Current Energy Demand - PV Export

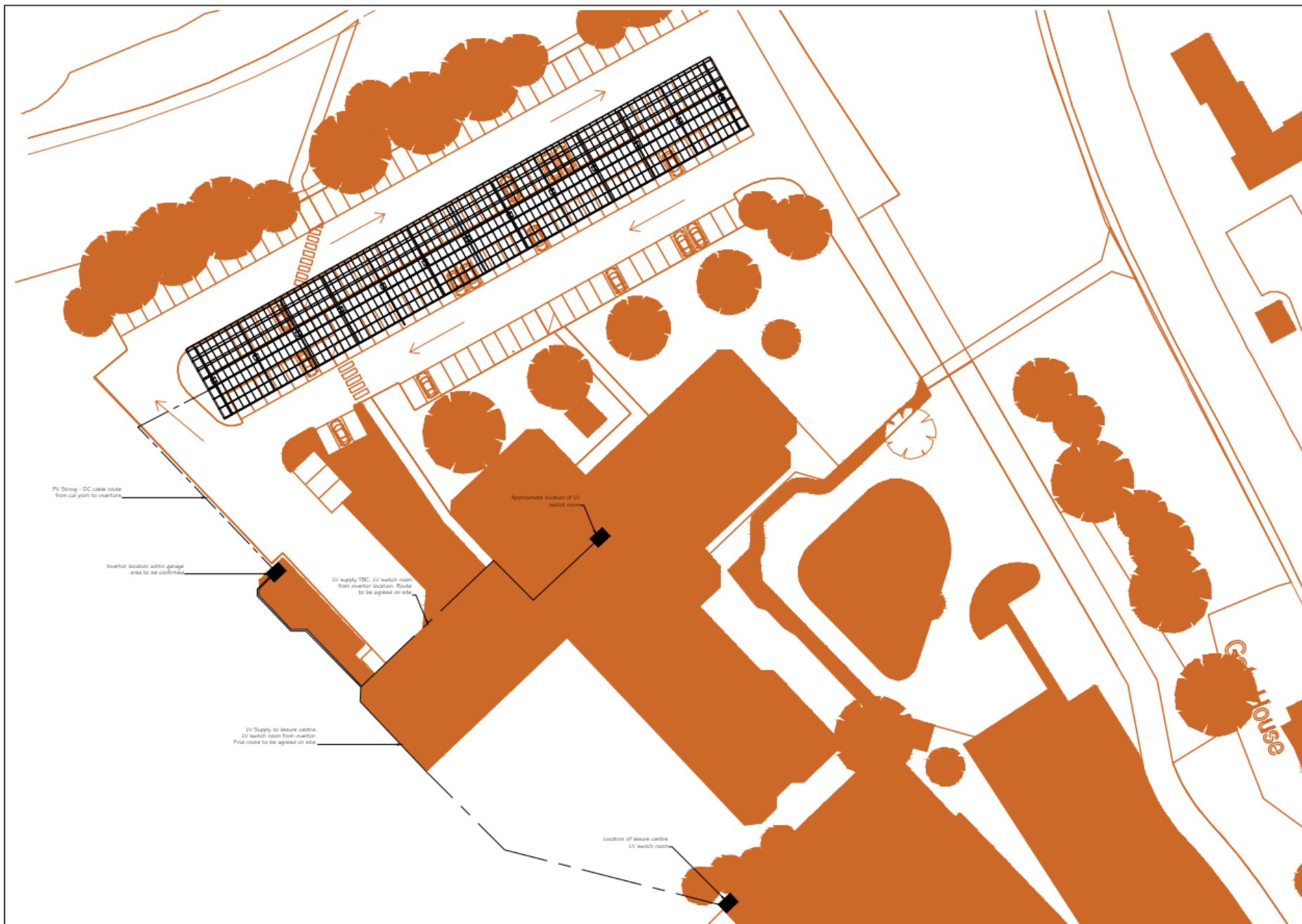


# The Solar PV Canopy

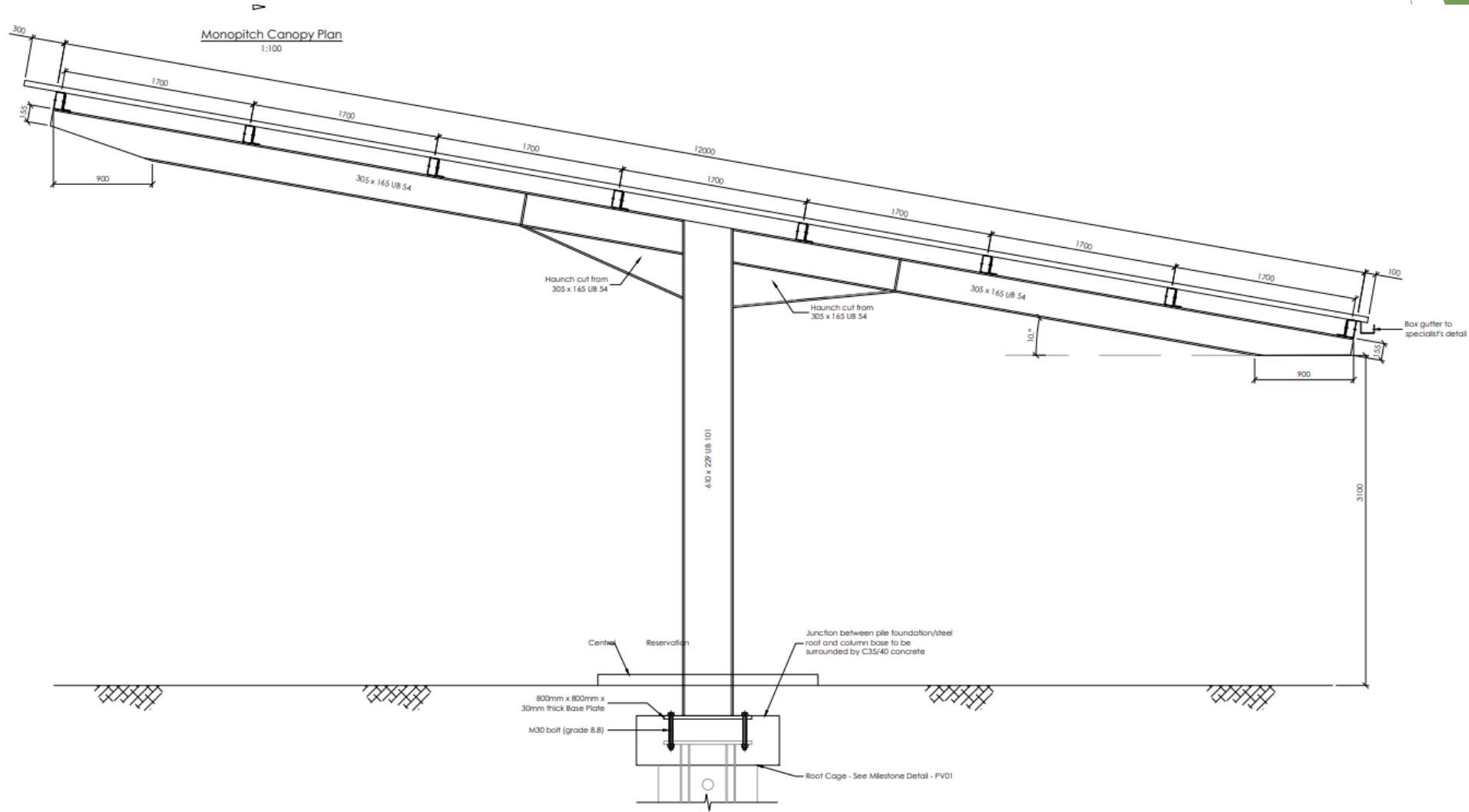
- ▶ A Solar PV Canopy was constructed in the staff car park at the rear of the Tewkesbury Public Services Centre during May and June.
- ▶ This is the fruition of two years of officer planning, feasibility work and countless revisions of funding applications to help reduce energy consumption from fossil fuels.

## What's involved?

- ▶ Located in the central reservation, the Solar Canopy is about 93m long, 12.5m wide and over 5m high at its highest point.
- ▶ The structure is supported by 13 columns and have over 570 Solar Panels on top.
- ▶ The canopy roof is angled to optimize the energy captured from the sun.
- ▶ Trenches were for cables to carry the electricity generated, under ground to the Council and Leisure Centre buildings.
- ▶ Any surplus electricity generated will also be fed back into the electricity grid.
- ▶ While the work was taking place an archaeological watching brief was also undertaken.



# Cross Section



# Delivery challenges



carbon  
neutral  
2030

- ▶ Funding application process, approval and timings
- ▶ Delivery deadlines and technical detail support
- ▶ Market influences
- ▶ COVID 19
- ▶ Planning application based on assumed outcome of tender returns
- ▶ DNO not determined until detail design agreed
- ▶ Unknowns:- Archeology, ground conditions, additional footings,



carbon  
neutral  
2030

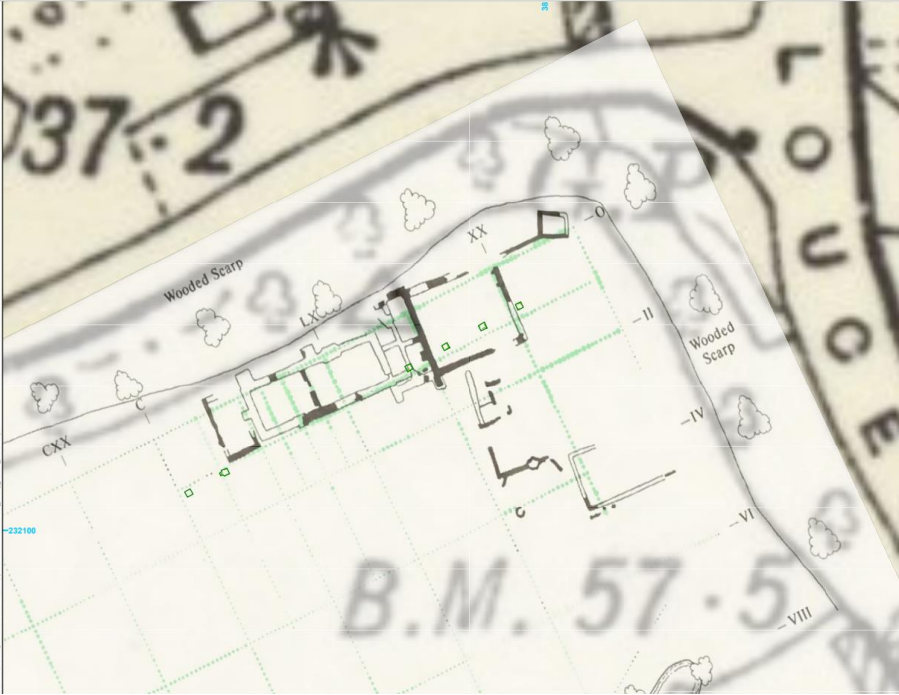
# Why was the project successful

- ▶ Political commitment to Carbon reduction programme
- ▶ Timely decisions by Council Members
- ▶ A committed project team, good communication and the ability to adapt and change at short notice
- ▶ Salix change process simple
- ▶ Good technical inhouse and externally support
- ▶ Polysolar installation contractor, working on a live site, understanding the clients' requirements, good understanding of their product

# Site Mobilisation and Ground Works



# Archaeology



# The Super Structure



# Roof



# External & Internal Electrics





# Protecting the Asset





# Car Park - Solar PV Canopy

- ▶ Installed Summer 2022
- ▶ System size - 230 kWp
- ▶ Cost £627,000
- ▶ Salix Grant Funding £284,200



Solar Canopy start generating in late August 2022

Approximately 40% of electricity feeds Public Service Centre

& 60% exported to Leisure Centre

230,176 kWh electricity generated to date

60 tonnes of greenhouse gases diverted

Equivalent to £51,215 in avoided costs

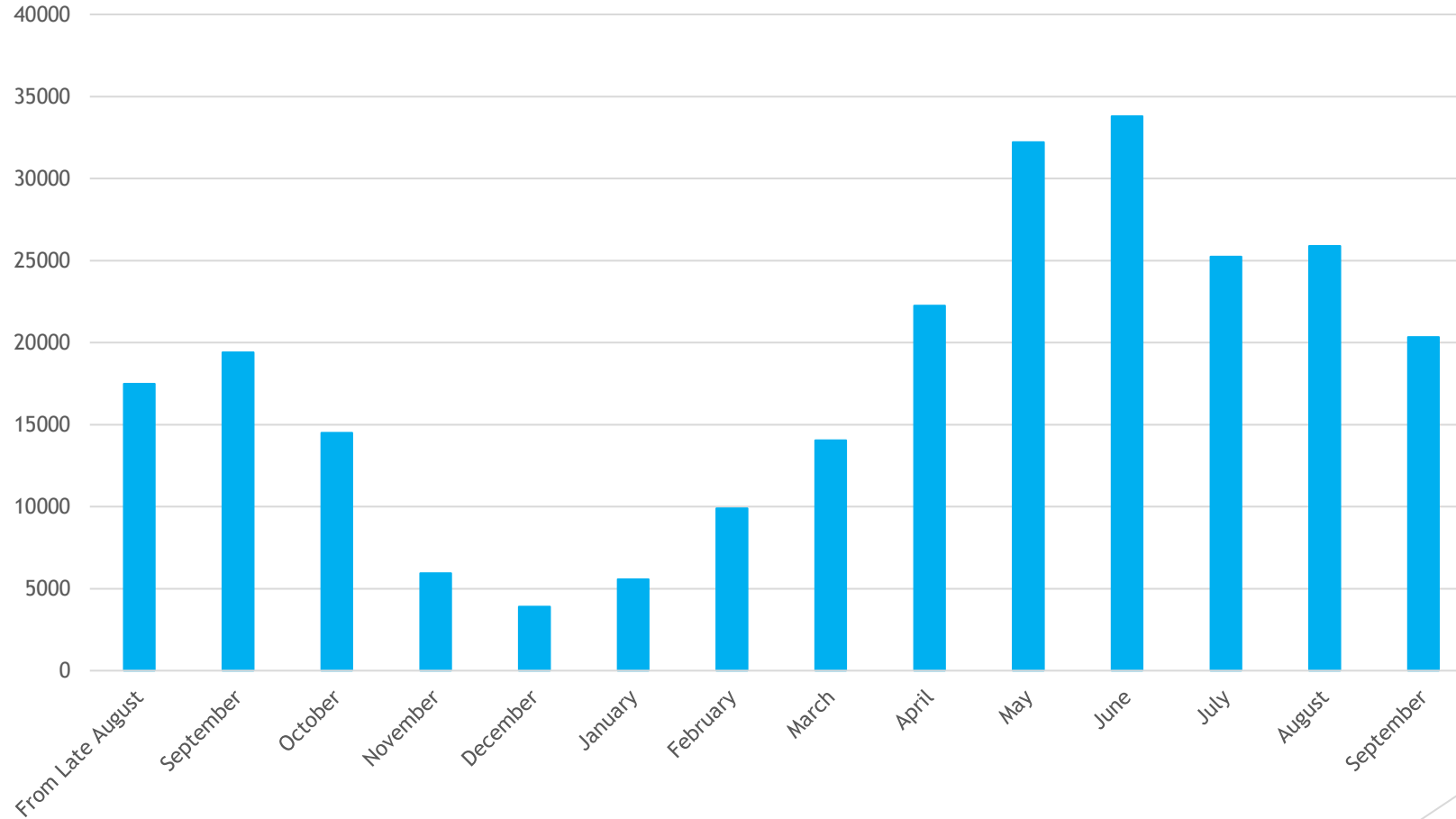


# Solar Canopy Generation (kWh)

(PSC & Leisure Centre Inverters)



carbon  
neutral  
2030

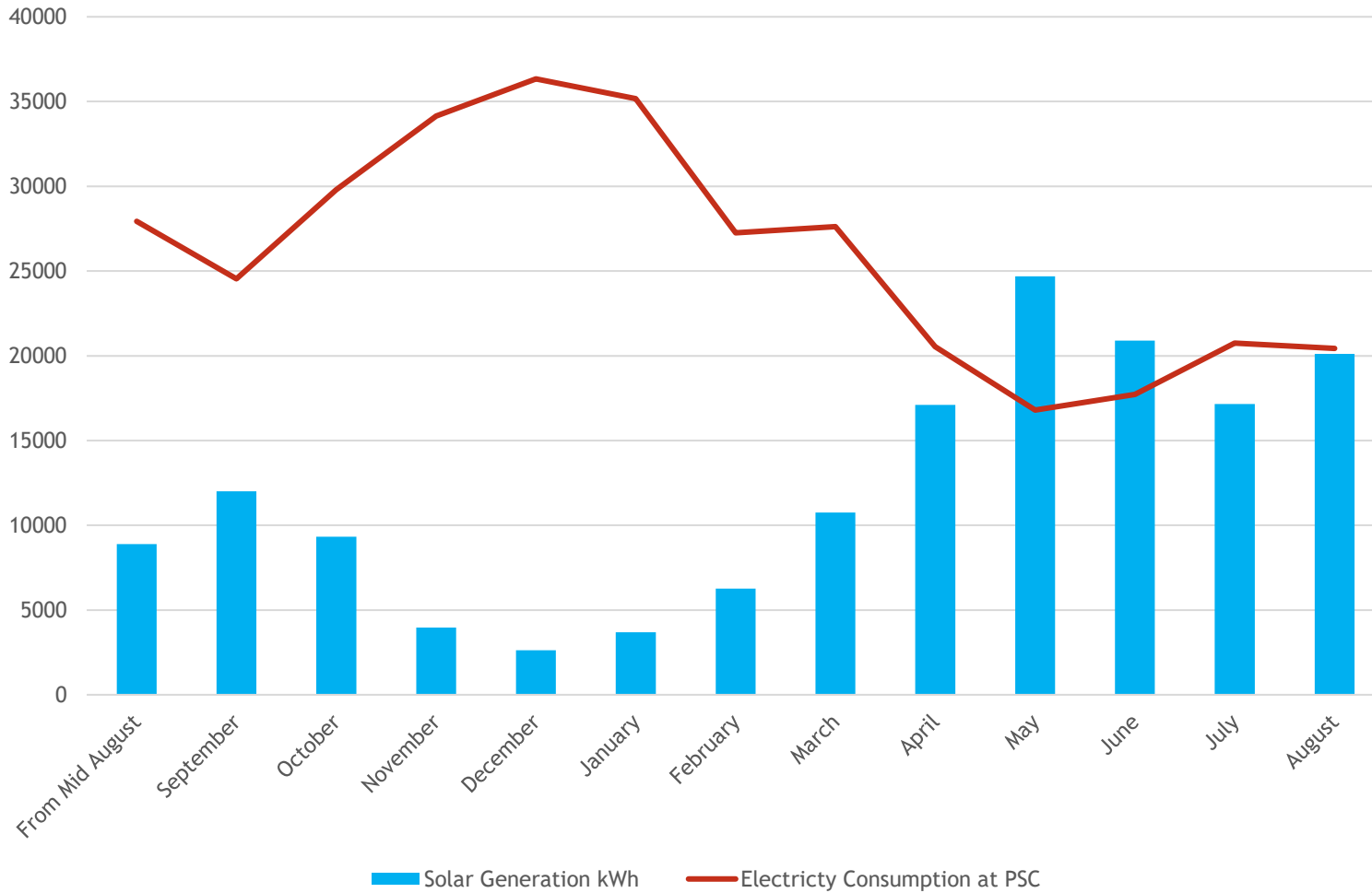


# Electricity Grid Consumption v Solar Generation

(PSC Roof & Solar Canopy Council Inverter)



carbon  
neutral  
2030



Tewkesbury  
Borough Council

# Recognition

We were very pleased with the overwhelmingly positive comments received on social media.

Video footage of the solar canopy has been viewed over 33,000 times and was shared around 190 times across our social media channels. Some of the comments received can be found below:

- ▶ *“Well done to all those involved in this project. An excellent example of what can and must be done.”*
- ▶ *“I act for a MD client operating electric HGVs who would like to learn more about your project. Who should I contact? Or could someone (the project officer) contact me? It would be appreciated - thank you.”*
- ▶ *“Oh my goodness. Well done Tewkesbury. This must be the way forward for all car parks, right?”*
- ▶ *“This is great! Looks good and hopefully delivers huge benefits. Saves countryside filling up with Solar farms!”*
- ▶ *“Large car parks like this are a much more natural place to install solar panels, rather than on good agricultural ground..., so long as they're vandal proof that is....”*
- ▶ *“If the payback is (currently) about 8yrs, why can't every supermarket and out-of-town shopping centre do similar??”*



carbon  
neutral  
2030



 **SOUTH WEST ENGLAND**

**ENERGY EFFICIENCY  
REGIONAL AWARDS**

**WINNER**

**COUNCIL OF  
THE YEAR 2023**

 [www.energyefficiencyawards.co.uk](http://www.energyefficiencyawards.co.uk)

 *Campbell Braybrooke Ltd*



# A Reminder of the Benefits

- ▶ Reduced greenhouse gas emissions
- ▶ Generating renewable electricity being used by the Council Buildings and Leisure Centre.
- ▶ The power generated is equivalent to around 70% of the council's demand.
- ▶ Savings of around £45,000 a year in avoided energy costs.
- ▶ The project received £284,200 grant funding from BEIS
- ▶ The electricity generated will make it easier to replace gas-fired boiler systems and introduce low-carbon air-source heating technology.
- ▶ It is a significant step in helping Tewkesbury Borough Council become Carbon Neutral by 2030 and will demonstrate the Council's commitment following the declaration of a Climate Emergency in 2019.





# carbon neutral 2030

Thank you  
and over to you for any questions

