# Future Energy Landscapes Workshop

## Graffam Parish: Tuesday 29th April

**This write up summarises what happened and what residents of Graffham Parish said during the Future Energy Landscapes workshop in April 2025. It cannot be assumed to be representative of the full range of opinions in the local community.**

**Please read through this report and provide your views via our short survey here.**

## Workshop Background

The Centre for Sustainable Energy (CSE) developed the Future Energy Landscape workshop to enable communities to have informed conversations about their understanding and feelings about renewable energy technologies. Using data[1] and research into what technologies might be applicable to the area the workshop supports a hypothetical conversation about what scale and types of projects might be acceptable to local people and what impact would those technologies have on their local energy needs.

The workshop was supported by Greener Graffham and funded by the South Downs National Park Authority. The objective was to ensure communities are part of creating a local vision for sustainable energy enabling them to play a part in shaping ambitious plans as we transition away from fossil fuels.

## Why the Future Energy Landscapes workshop?

- Transforming the way that we generate and use energy is key to tackling the climate emergency.
- Generating more energy from renewable sources, so we produce less carbon is key to a transition away from fossil fuels.
- Communities need to be better informed about low carbon renewable energy technologies.
- Local people need to be consulted about the energy transition towards renewable technologies and supported to have informed discussions about the different solutions.
- Community energy should be recognised as an essential component of our energy transition so local communities benefit from renewable energy generation.

[1] See **Appendix 1** for details of the data, research and assumptions that have been used to build this workshop.

## Workshop summary

**Workshop purpose:** To explore the question '***How might Graffham power its community using locally generated renewable energy?'***

**Workshop boundary**: These workshops use the civic Parish boundary to pinpoint the discussion around an area that is familiar and frequented by the participants. It is an arbitrary boundary, but it is useful to focus the conversation on how acceptable people would find renewable technology in their local landscape.

**Graffham** is a village and civil parish situated on the northern escarpment of the South Downs with the River Rother running along its northern boundary. The parish is made up of the village of Graffham, part of the hamlet of Selham, and South Ambersham.

**Workshop process:**

1. **Connect to the landscape,** considering areas that are important.
2. **Learn together** about different types of renewable energy
3. Have an **informed discussion** about how we feel about the technologies.
4. Discuss if and **where different technologies might be acceptable** in the local landscape.
5. Use graphs and data, to understand how much electricity and heat the different combinations of technologies would **generate,** the impact on current local energy needs and related carbon emissions.

## What was said?

After marking up maps and spending time sharing local stories about the local landscape and people's connection to it, the group watched short videos about the different renewable technologies that were locally feasible. In groups we then started a detailed discussion about the following technologies:

a) Wind Power
b) Solar Farm (12 Acres)
c) Domestic solar
d) Domestic heat pumps

Each group worked through the following questions:

- How do they feel about the technology overall?
- How much of the technology would they be happy to see in their landscape? (i.e. quantity of rooftops with solar or the no. of a particular sized wind turbine)
- Where might this technology be located?
- How does it impact the landscape? Who would this affect most?
- Is this a realistic suggestion and what might the barriers be to implementation?

### Impact of different renewable energy technologies

Each table fed back their reflections about their specific technology, and where they felt, and on what scale, the technology might be located, if at all, in the boundary of the parish.

The group's suggestions on the amount of each technology were inputted into the CESAR tool [2]. The CESAR tool is a spreadsheet, with simple bar graphs, that shows how much energy is used by the local community, how much carbon that generation produces and how this might change by using renewable energy technologies to generate local electricity and heat.

**Graffham in numbers:**

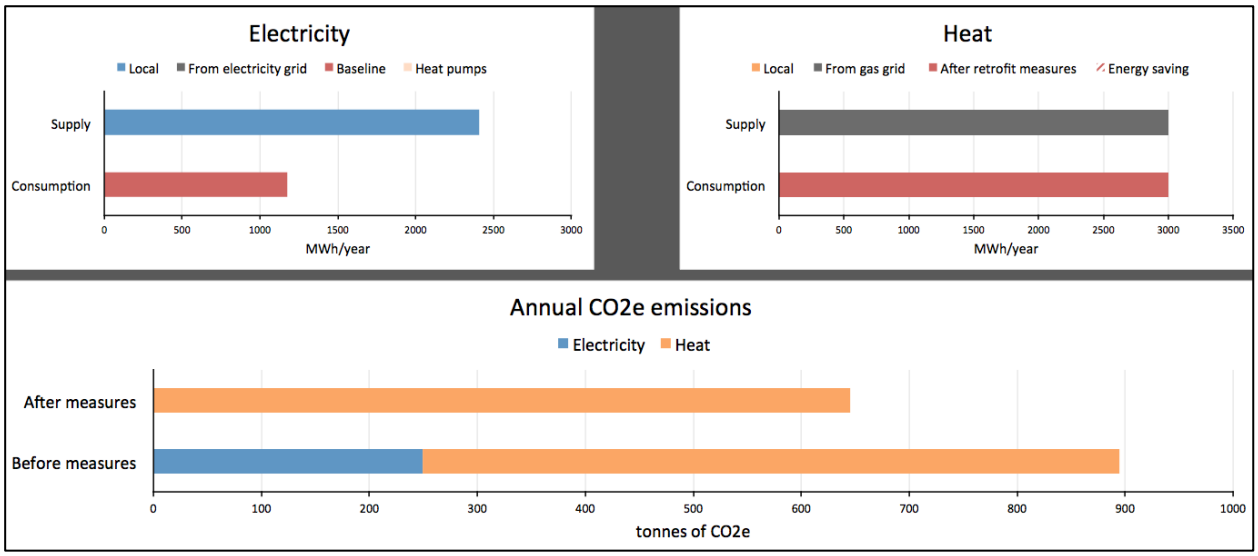
- 520 residents
- 220 homes
- 900 tonnes $CO_2$ pa
- 1,200 MWh electricity pa

The ideas of the different groups and what the CESAR tool illustrated were then offered for further comment and discussion to the wider group.

[2] The Community Energy Saving and Renewables (CESAR) tool was developed by the Centre for Sustainable Energy and is designed to help workshop participants think about how they would provide some or all their energy needs from renewable energy and to see the different amounts of heat or power generated by the different renewable technologies in their local context.

## Solar Farms

The first group looked at solar farms and started their discussion by agreeing that before considering generation projects community action should start with reducing the demand for electricity (see the Retrofit section below). They were supportive of the technology but the aesthetics of the area are really important so they felt strongly that any solar would have to be very well hidden. Though they were tasked with discussing plots of 12 acres of solar they thought it would be much easier to hide it from view if they were divided into smaller plots. They speculated that it might be easier to screen smaller plots to the north of the parish with the woodland and away from the gaze of the South Downs perhaps locating it around the sewage farm.




**Impact of one, 12 acre solar farms split over different sites**

The graph illustrates that 12 acres of, discreetly located, ground mounted solar would generate over double the amount of electricity *currently* needed by the local community of Graffham and consequently remove the carbon emissions from fossil fuel burning electricity generation.

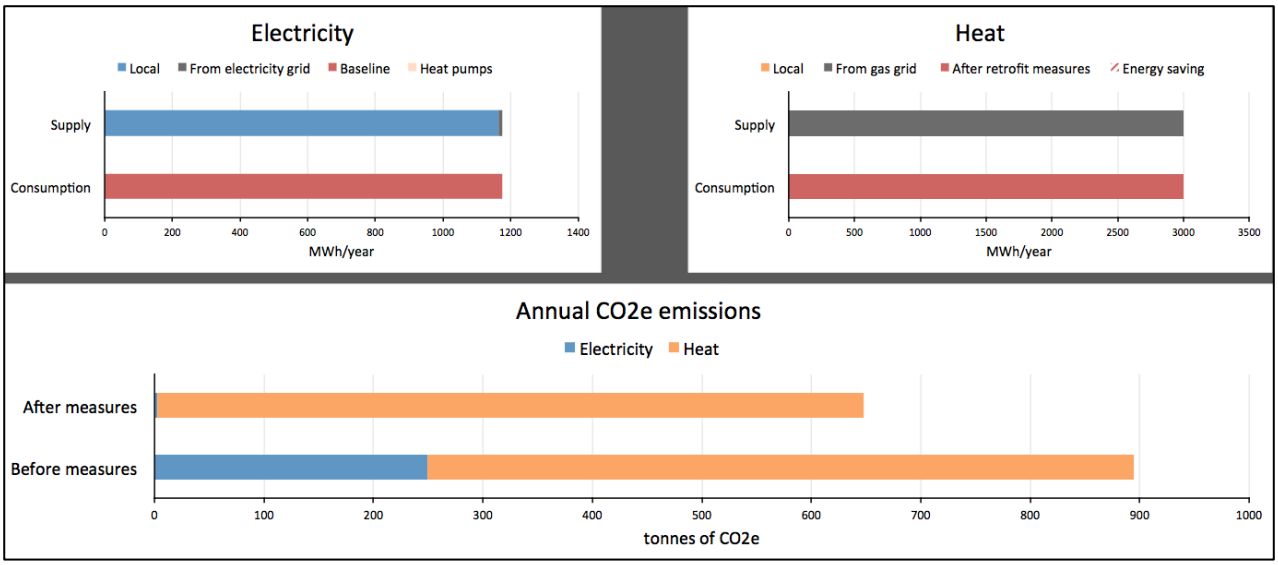
The wider group shared their reflections and discussed the following points:

- The importance of storage, though large storage with batteries with a community energy model is not yet a proven concept or financially viable.
- Energy storage is a key part of the future and there are different types being developed ie gravity batteries, hydrogen/ammonia battery systems, etc
- Future energy systems will also have to include demand flexibility, moving demand, time of use tariffs etc.
- In the future, as we move to electrifying our heating and transport we will need about 2.5 times more electricity than we currently use (ie a couple of 12 acre solar farms).

- Solar is part of the solution but as it is not sunny all the time and generation slows dramatically in the winter, a local community would sometimes have to draw some power from the national grid to meet demand.

## Wind Power

The next group discussed wind power and instantly struggled to see how wind turbines might be accommodated in Graffham. They liked offshore wind turbines (ie out to sea) but had concerns regarding potential noise and wondered if a small turbine (height to blade tip: 60 metres) could find space alongside the pylons in the scrub near Amersham Common.

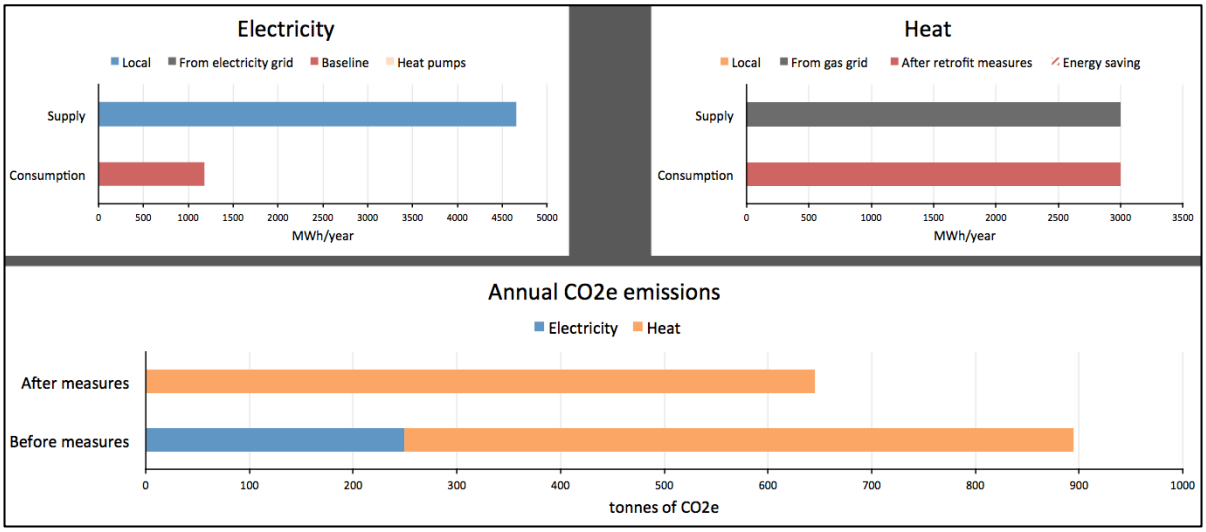



**Impact of 1 x small wind turbine on the local electricity demand**

The graph above shows that only one small, 60 m high turbine would be needed to meet the *current* electricity demands of the parish and reduce the $CO_2$ emissions by a third.

We did then look at what two medium sized turbines might generate for Graffham as we look into a future where the demand for electricity would dramatically increase.

The graph below shows that two medium turbines (95 meters to the tip) would generate four times as much electricity than is currently used by the community. There was broad agreement however that the visual impact, though subjective, could be difficult to reconcile.



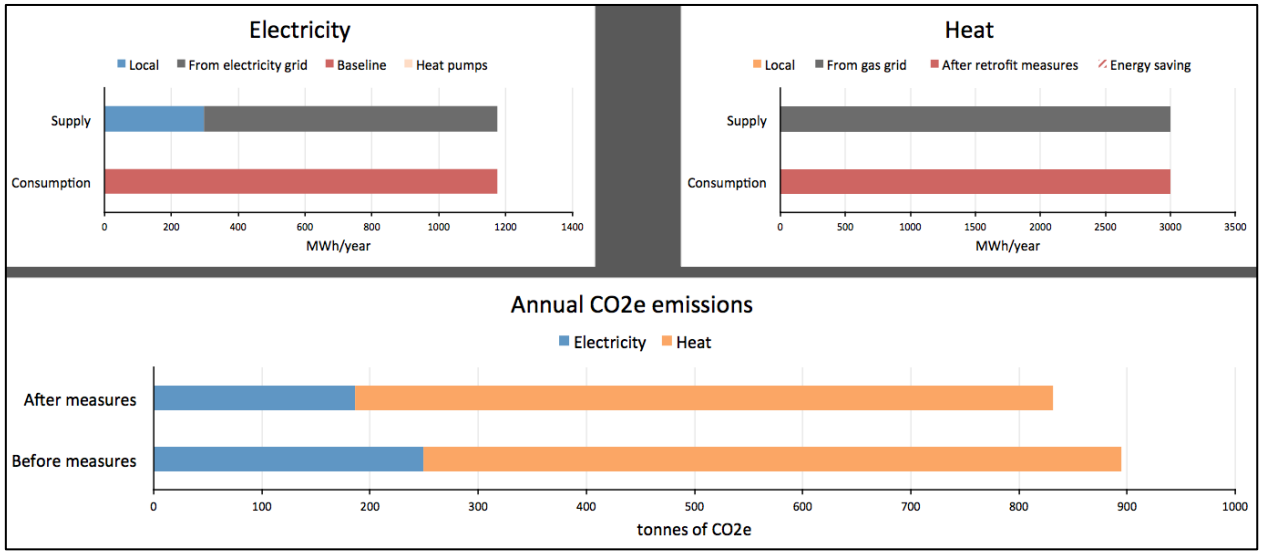

**Impact of 2 x medium wind turbines on the local electricity demand**

Further points were also discussed by the wider group:

- Wind turbines have to be sited at least 500 meters away from houses to safeguard against sound issues.
- Solar and wind generation can be sited together but wind turbines need to be spaced with a clear area five times the diameter of their blades, so solar panels could not be tucked in around the base.
- There were concerns over the danger to birds. As a comparison we talked about a (now disused) power station in Fawley, Southampton killing 200,000 fish a year as a result of the filters across the water pipes drawing water from the sea into the power station and cats being responsible for the death of 40 million birds each year in the UK compared to the 50,000 to 100,000 birds killed by wind turbines. There are difficult trade offs for all technologies that need to be considered.
- There were concerns about the visual impact along with the challenge that a community owned turbine would not necessarily generate power that could then be directly used by the local houses.
- Local Energy clubs with Energy Local have a scheme which rewards matching power use to local generation, with discounted power when generation is high.
- Example in Lymington of a community energy owned solar farm, set up in 2014 which was funded by 500 local people buying community shares. 2.5MW, same power output as the 12 acre farm, and that's been generating electricity owned by local people, producing a return for those 500 investors of about 5% a year, producing profits that are going to fund local community projects.
- Pylons would have had the same objections that we see now of wind turbines but mixed feelings in the room about the extent to which we mind them now.

## Domestic Solar

This group had the task of discussing the domestic use of solar on domestic roofs. There were completely diverse views of what people thought about the attractiveness or not of solar PV on roofs. They approximated that up to 20% of homes already have some sort of PV on their roofs but the group struggled to reach a consensus on how much domestic solar they would like to imagine the homes in Graffham having in the future. They did agree that solar was less intrusive on new builds compared to period properties.




**Impact of 35% of homes having an 10-12 solar panels**

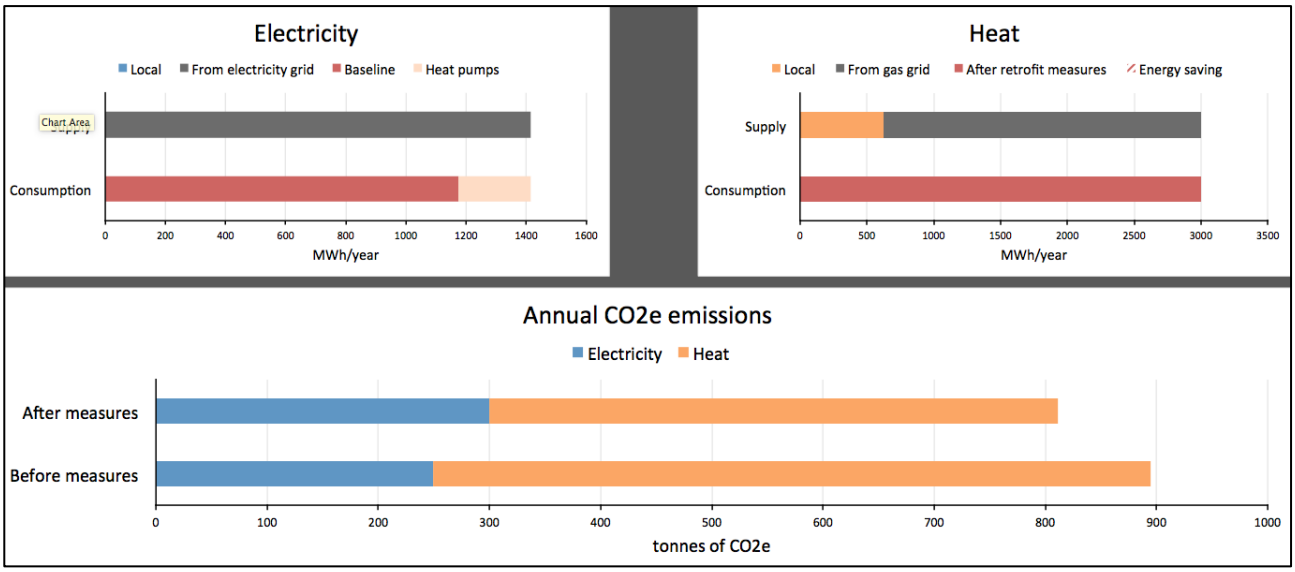
We looked at how 35% of homes having panels would impact the electricity demands of Graffham. The graph illustrates that amount of domestic solar would meet a quarter of the electricity used currently by the parish. For a simple and proven technology that is a significant contribution and would mean that we would need less of the larger more intrusive generation technology.

The table and wider group went on to the discuss the following points:

- The homeowners are the ones that benefit from the local generation but then in turn it reduces the amount of energy that needs to be produced by the National Grid.
- At the moment houses are not able to share power with the neighbours but Power for People are campaigning for the Local Electricity Bill but it has failed to be passed despite strong Parliamentary cross party support.
- There are solar panels that are roof slates but are more expensive, less efficient, would require the roof to be replaced and would need planning.
- In terms of economies of scale, a 12 acre solar farm is far cheaper and easier to install than lots of different systems on different roofs and for some people more attractive than each house having different panels and set up.

## Heat pumps

The final technology that was discussed was domestic heat pumps and they were a very positive group about the technology with a keen interest despite no one currently having one installed. They spoke about the barriers to homeowners taking up the technology with a large financial outlay even if your boiler needs replacing. They felt there was a lack of incentives for people to invest in the technology and the group discussed the benefits of interest free loans or better finance that would make the offering more accessible. The group felt that even though 50-60% of homes could have a heat pump they felt that with the lack of urgency that it was reasonable to imagine 25% of homes with air source heat pumps.




**Impact of 25% of local homes having an air source heat pump**

The above graph illustrates that if a quarter of local homes were to have an air source heat pump that would meet almost a quarter of the total heat demand of the local community (domestic + non domestic) and remove a significant amount of the carbon emitted from burning fossil fuels to heat homes. The electricity demand would increase as heat pumps are powered by electricity but they are 3-4 times more efficient than a fossil fuel boiler so the overall energy use would be reduced.

The table and wider group also picked up on the following points:

- It is of course good practice to better insulate your homes ensuring you then have a smaller heat pump but the logic and research suggests now that homeowners should reduce their heat demand as quickly as possible and get a heat pump, then work on the more costly / tricky retrofit elements to further reduce demand. The heat pump straight away reduces your household carbon emissions.
- The initial outlay is incomparable to refilling your boiler at £600 a year so people just keep doing that.
- The noise factor of heat pumps has been a concern however as the technology develops so does the policy. Following a recent government consultation they

are now removing the planning restriction that heat pumps have to be one meter away from the boundary of your property.

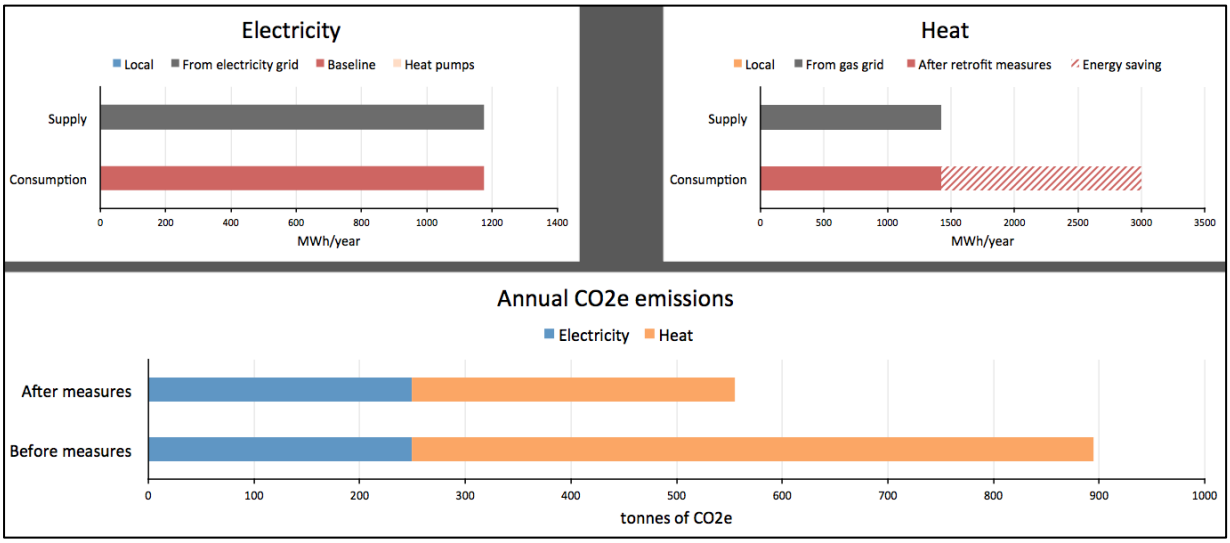
- We do need more heat pump engineers and more education with gas engineers so they transfer their trade.

## Retrofitting

As was highlighted by the first group, any community discussion about energy must start with seeing what house owners can do to reduce their energy demand.

The CESAR tool allows us to look at how making homes more thermally efficient could reduce the heat demand, and therefore the energy required by Graffham, based onsome broad assumptions made about the local housing.

We suggested that 50% of local homes were built pre-1930 and 50% were built between 1930-1990 with perhaps a nominal number of homes built after 1990.




**Impact on the heat demand following a local retrofit programme**

The above graph demonstrates that energy efficiency measures like draught proofing, insulation and double or triple glazed windows to improve the energy efficiency of the lowest performing houses could reduce the local heating demand of Graffham by over 50%, as indicated by the highlighted area on the graph. This demand reduction is the important starting point but it has to be done by the individual household and so it is hard to influence. Reasonable retrofitting would reduce the amount of energy needed to heat these homes and therefore we see an important reduction in the carbon emissions from heating before even looking into domestic level or larger renewable infrastructure generation.

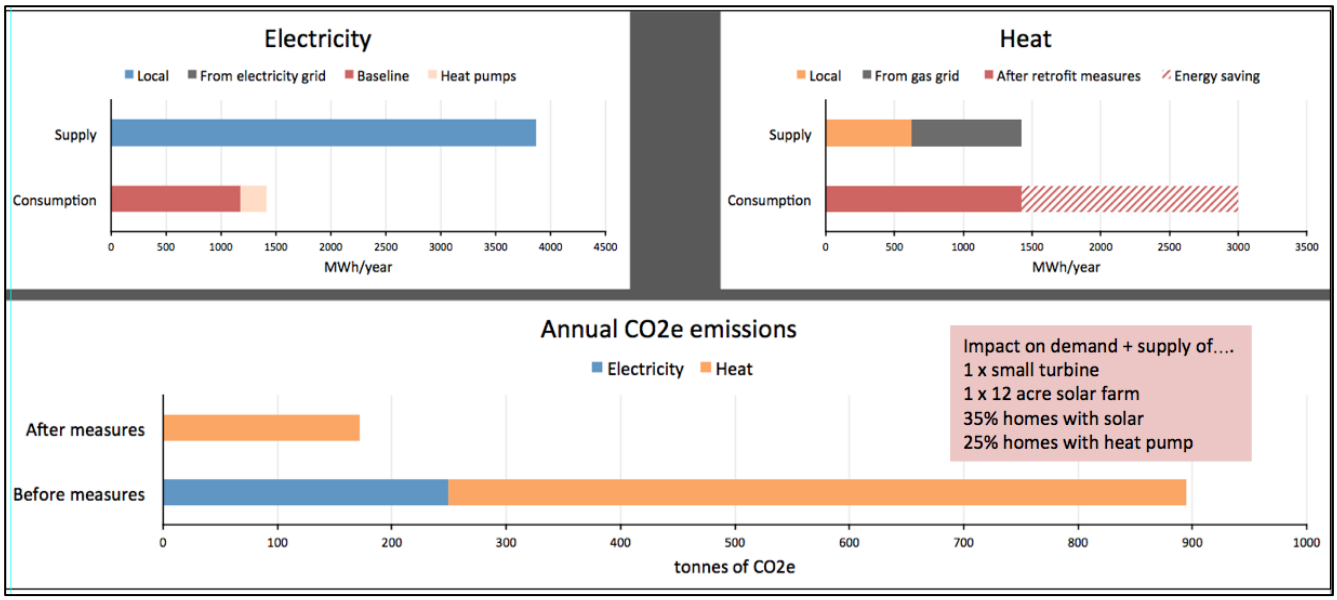
## Technologies in combination

As was discussed by the different groups, none of the technologies hold the complete answer so the CESAR tool was used to see what might be generated if we were to combine all the technologies.

For this we input into the CESAR tool all the technologies along with how much each group had suggested was acceptable in the local area to see what the impact would be on supply and demand. We also included the energy efficiency retrofit measures explained above.

As a reminder the technologies that the groups felt could hypothetically be part of Graffham's future energy landscape were:

- 1 small wind turbine
- 1 x 12 acre solar farm
- 35% of homes with 10-12 solar panels
- 25% of homes with a ground source heat pump




**Graffham's Future Energy Lanscape**

By reimagining the local energy system in this way, with a fairly conservative deployment of renewable energy technologies alongside improving the energy efficiency of local homes, Graffham could potentially remove over 75% of its carbon emissions from its current demand of heat and electricity from the burning of fossil fuels. The community could almost half its local heat demand through a retrofit programme, whilst generating three times as much electricity as it currently uses

## Conclusion and recommendations:

It was a great gathering of people from Graffham and an important opportunity for local people to share their thoughts about different renewable energy technologies and also learn from each other about how the different technologies work and what could be possible where they live.

This exploration of possibilities can be challenging due to the unique nature of the surrounding landscape in Graffham but differing opinions were raised and listened to as a community.

Despite the recognised limitations of the landscape there were a few suggestions that the local community might take forward:

- Develop opportunities to share peer to peer experience of domestic renewables particularly heat pumps ie develop local case studies.
- Ensure the local community is kept informed of changes to funding around domestic solar and heat pumps.
- Identify opportunities to support local homeowners with how they might better insulate their homes, signposting to advice or using a thermal imaging camera to show the leaks.
- Explore conversations with local landowners about the potential for solar and wind, albeit small community owned projects.[3]
- Support and champion the Local Electricity Bill by following Power for People.
- Mobilise local people to put pressure on the local authority to demand and enforce higher standards from developers building new homes in the area.
- Share this report and associated survey more widely, to as many people in the local community as possible, so they can share their thoughts.

This was a hypothetical conversation based on data and research and put to one side constraints such as planning, expense and grid capacity. The discussion format aimed to help people learn together about what the different technologies are and how they work. The discussion sometimes opens local possibilities about possible generation projects but also highlights what is critical and needs to be done at a national level through policy to help us all transition away from fossil fuels.

## Appendix 1 - Tools, assumptions and research

[3] For detailed information on guidance about renewables in the South Downs National Park see https://www.southdowns.gov.uk/wp-content/uploads/2022/04/Small-Scale-Renewable-Energy-TAN.pdf

## Tools

**Future Energy Landscapes:** toolkit here

**CESAR (Community Energy Saving Renwables) workbook:** Showing renewable energy generation in relation to how much energy the community uses and the impact of renewables on carbon emission reduction.

**Impact Tool:** An estimator of a community's carbon footprint that works for parishes, wards, district councils and unitary authorities here.

## Assumptions

**Onshore wind and solar farms**
Assessments of suitability of landscape for different technologies represent an upper bound estimate and do not take full account of the impacts associated with potentially limiting characteristics (proximity of roads, railways land type etc.) (LUC, 2018). Spacing of wind turbines is based on an allowance of five times the rotor diameter (LUC, 2018).

**Rooftop PV**
Suitable rooftop is defined as one on which a minimum of a 1 kW solar PV system can be installed (8 m2 rooftop area required), with an orientation east through south to west and at an angle between 15° to 70° (Palmer et al., 2018).
Analysis suggests that in the City of Southampton district 67% of rooftops had one area that satisfied the criteria (Ridett and Anderson (2023), p19), while in the wider Winchester City area 78.8% had a rooftop surface that was deemed as suitable for a rooftop PV installation of at least 1 kW (Ridett and Anderson (2023), p20).
These figures are likely to represent an upper bound estimate of solar PV potential. For the purpose of the CESAR tool, an estimated potential of 75% suitability would provide a realistic upper bound estimate.

**ASHP/GSHP**
Based on assumption that dwellings need to be reasonably airtight and well insulated. Significant proportion of post 1990 houses plus an allowance for others that might have had deep retrofit we assumed 50% of homes could have an ASHP. We then considered that older homes in the centre of the towns / villages would have bigger gardens so assumed 25% would have room for GSHP.

## Research

LUC (2018), Renewable and Low Carbon Study for the East Hampshire District, p48

Palmer D., Koumpli E., Cole I., Gottschalg R. and Betts T. (2018). A GIS-based method for identification of wide area rooftop suitability for minimum size PV systems using LiDAR data and photogrammetry. Energies, 11(12): 3506

UK Government (2023) Figures for English Housing Survey headline report 2022 to 2023.

West Sussex County Council (2024) Energy Strategy 2024

Chichester District Council Climate Emergency Action Plan (2019 and consultation and review 2024)