Future Energy Landscapes Workshop

Boxgrove: Wednesday 8th October 2025

This write up summarises what happened and what residents of Boxgrove Parish said during the Future Energy Landscapes workshop in October 2025. It cannot be assumed to be representative of the full range of opinions in the local community but is an accurate record of this important conversation with Boxgrove residents.

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 funded by the South Downs National Park Authority (SDNPA). 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.

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

- Community energy should be recognised as an essential component of our energy transition so local communities benefit from renewable energy generation.

Workshop summary

Workshop purpose: To explore the question

'How might Boxgrove 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.

Boxgrove Parish is a rural civic parish east of Chichester at the foot of the South Downs known for its rich history and picturesque landscapes. Included in the parish are the hamlets of Halnaker, Crockerhill & Strettington. It includes a world famous Lower Palaeolithic archaeological site and other important historical sites such as Halnaker Windmill and the twelfth-century Benedictine priory ruins and church.

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 pump

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, with simple graphs, 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 power.

Boxgrove in numbers:

- 1,900 residents
- 480 homes
- 2,500 MWh electricity pa
- 1,925 tonnes CO_2 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.

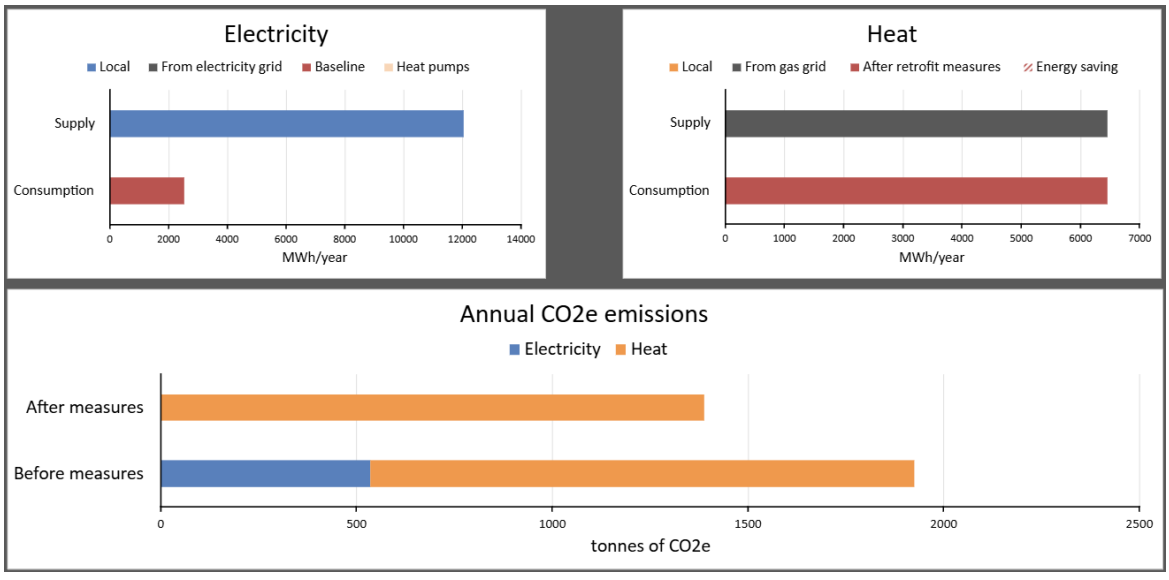
[2] The Community Energy Saving and Renewables (CESAR) tool was developed by the Centre for Sustainable Energy and is designed to help workshop participants think about how they would provide some or all their energy needs from renewable energy and to see the different amounts of heat or power generated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

Solar Power

The first group looked at solar power and were all strongly in favour of solar farms. It was noted that the efficiency of solar panels converting sunlight to electricity can be as low as 15% but that efficiency of all technologies is an issue. The group said that people don't like solar farms next door but prefer them to houses. Biodiversity was cited as a potential benefit of solar farms because mono-arable crops, heavily sprayed can be replaced with grasses and wildflowers leading to biodiversity net gain.

The group proposed 5 x 12-acre farms linear along the side of the north carriageway of the A27 from Strettington to Crockerhill as very realistic. Areas proposed included Long Meadow, near Boxgrove Substation, Boxgrove Common (where energy storage system is planned to go) and North or Town Lane. Trees and hedges on the north side of the solar array would mitigate any visual impact. The group considered how they might go further with solar on all new builds and warehouses.

The proposed 5 sites are about 12 MW which is similar in size to the existing solar farm at the junction of the A27/A285. We looked at what this ambitious 60 acres of solar might contribute to the local electricity needs of Boxgrove.



Impact of 5 x 12-acre solar farm on the local electricity supply

The blue line of the electricity graph above, shows that 5 x 12-acre solar farms could generate 4-5 times what we are using now and reduce CO_2 emissions by about a quarter.

The wider group shared their responses to this table's suggestion and discussed the following points:

- The wider group emphasised issues about energy storage
    - Renewable technology is less useful without storage, e.g. half of offshore wind turbines at Worthing have sometimes been switched off while additional storage is being considered.

    - Where energy storage is sited is an issue, e.g. a lithium battery storage system proposed for Boxgrove Common with additional trees around it could be a high fire risk and is a sensitive area.

  It was suggested that solar farms should have their own storage on site otherwise creating another problem somewhere else.

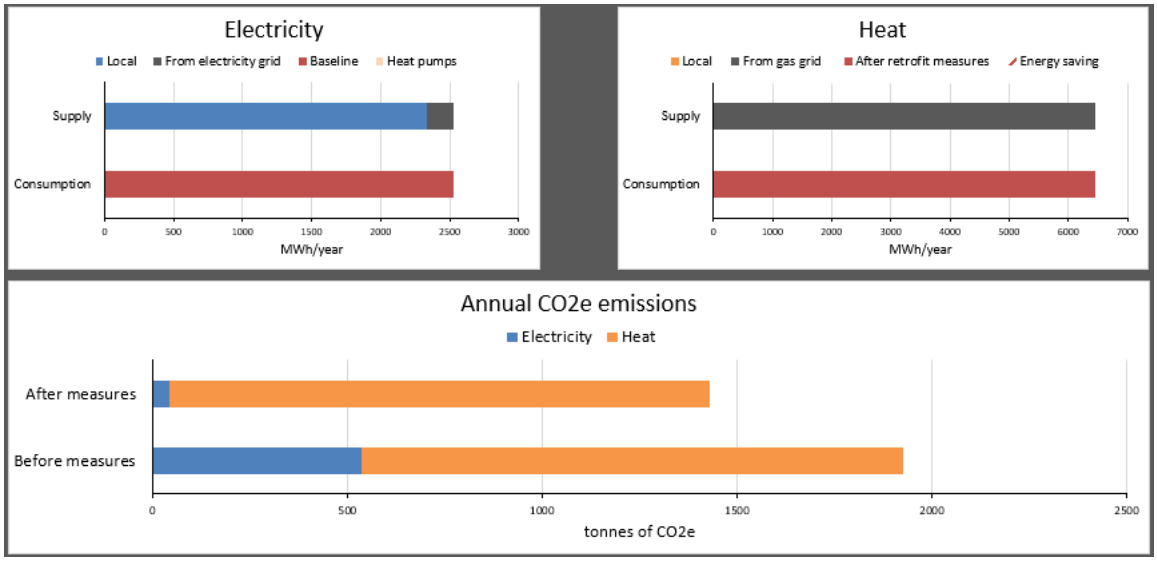
- The National Energy System Operator are responsible for designing a better energy infrastructure for the future that will enable energy demand to be met with more flexibility through different types of energy generation with less reliance on storage. This is part of the aim of the current government to reduce gas powered electricity generation from 40% to 5% by 20230.
- The land proposed for solar farms along the A27 is good use of land, especially the bit where the beehives are, because the quality of the soil is poor. Appropriate sites should be hidden from view and not facing roads. The north side of the A27 was considered a good site in this respect. Flooding was mentioned as a possible risk of this site which is at the lowest part of the parish.
- There is often concern about the use of productive land for solar farms. The counterpoint is that generally, it is not possible to get planning permission for a solar farm if the land is mainly high-grade agricultural land. As a comparison it was noted that projected figures for land use for solar farms to fully decarbonise the UK electricity grid is slightly higher than 1% of farmland in the UK. A similar percent of land is currently used for golf courses.
- There were questions about ownership and energy distribution. There are systems where communities can buy electricity from local renewable energy generators, but these are not widely available. If you produce energy locally from a community-owned generator those electrons can't be used locally but are fed into the grid and increasing the availability of all renewable energy. The Campaign for the Local Electricity Bill is aiming to change this.
- Community ownership means that the capital for the renewable energy project is raised from individuals who then get a return on that investment once the installation costs have been repaid. If there is surplus money this can be used for a community benefit fund.

Wind Power

This second group were supportive of wind turbines in principle feeling that they are a suitable offshore technology. However, most of this group were set against wind turbines in Boxgrove, feeling that they are unacceptable in a parish that has half the land in the South Downs National Park (SDNP). Boxgrove is hilly and wind turbines require exposed high positions, but these areas are protected and very visible and seen for 25 miles in each direction. The area that was considered as technically but not

aesthetically an ideal spot for a wind turbine is where the Halnaker Windmill is located, a listed historic monument in the SDNP.

There was some interest in wind turbines in the group, and we looked at what 2 small wind turbines might generate. These are about 60 meters high to the tip of the blade with a 40m hub height hub and 35m rotor diameter.

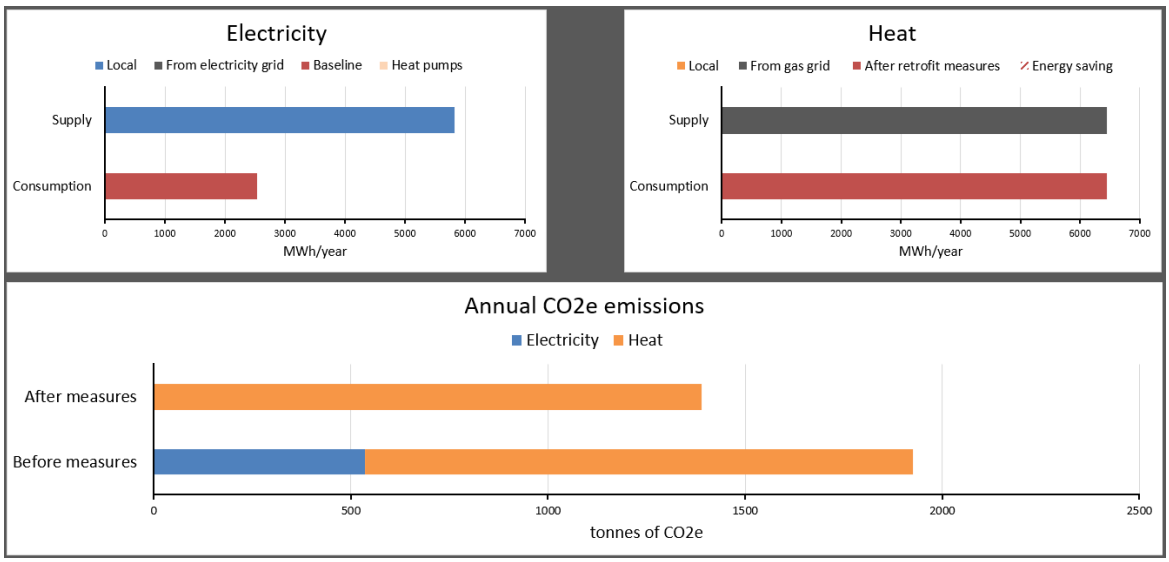


Impact of 2 x small (40m hub height) on local electricity supply

The above graph shows that 2 small wind turbines overall would generate almost enough renewable electricity to meet Boxgrove's annual electricity demand.

Whilst 2 small wind turbines might be visually more acceptable – as a comparison we looked at what one large turbine might generate against Boxgrove's current electricity demand. Due to the logarithmic relationship between height and energy generation – you get more than double the energy when doubling the height of the turbine.

A large wind turbine is about 140m in height (100m hub height and 80m diameter rotor). This is equivalent to a 40-storey building. As a comparison the Spinnaker Tower is noted to be 170 m. The graph below illustrates how a single large turbine would generate 2.5 times as much electricity as Boxgrove is currently using. Large wind turbines are generally more commercially viable.



Impact of 1 x large (100m hub height) wind turbine on local electricity supply

The wider group considered the following:

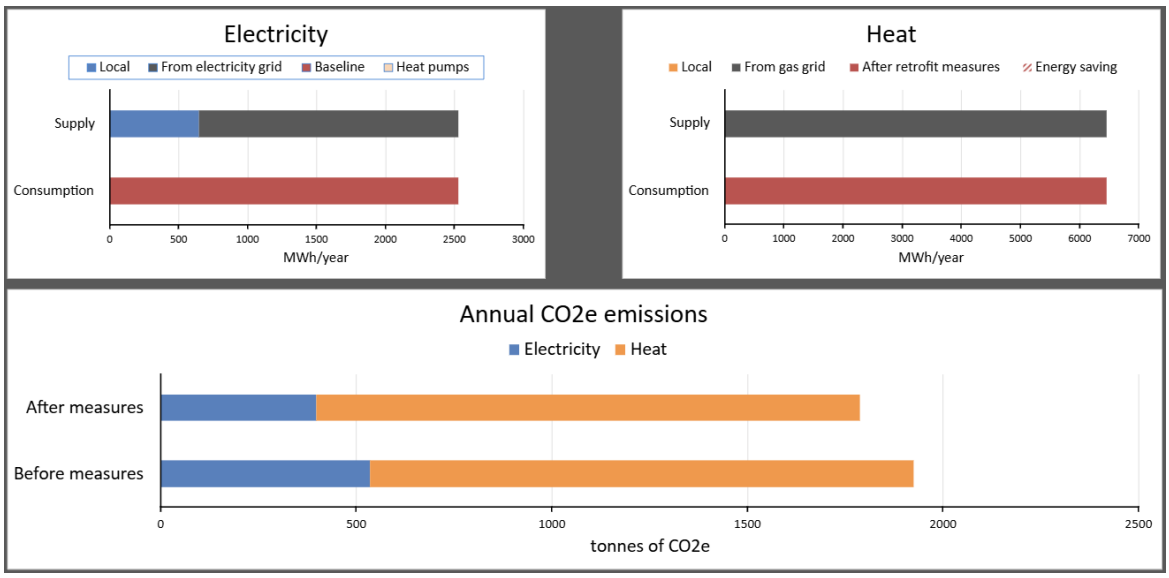
- A wind turbine on the lower parts of the parish might be an acceptable view. For example, the view as you are driving on the A27. It is quite open and it was noted that you would need 500 meters between it and the nearest house. Measurements would need to be completed to see if the minimum average wind speed of six meters per second would be met to make it commercially effective. The substation along the A27 may be a suitable grid connection and help make it commercially viable
- There was a question about 3-4 smaller wind turbines as seen on the roof of a big school in South London that were quite insignificant in terms of visual appearance. Unfortunately, as wind technology gets smaller, particularly on or attached to buildings it becomes very expensive – so generally domestic owned wind turbines are not viable.

Domestic Solar

The last table discussed the domestic use of both solar on roofs and heat pumps.

Taking solar first they were in support of the technology. The group were concerned about the visual impact especially in a historic and beautiful place like Boxgrove. Lots of solar panels visible from the street would not be supported.

There was discussion about the importance of battery storage to maximise benefits and the group compared installation on individual homes to participation in a community solar scheme. Putting 100 panels on the ground is more cost efficient than installing 10 panels on 10 different roof tops – each roof needs its own scaffolding, permission and installation. However, rooftop solar doesn't use as much land, so there are pros and cons to either scenario.

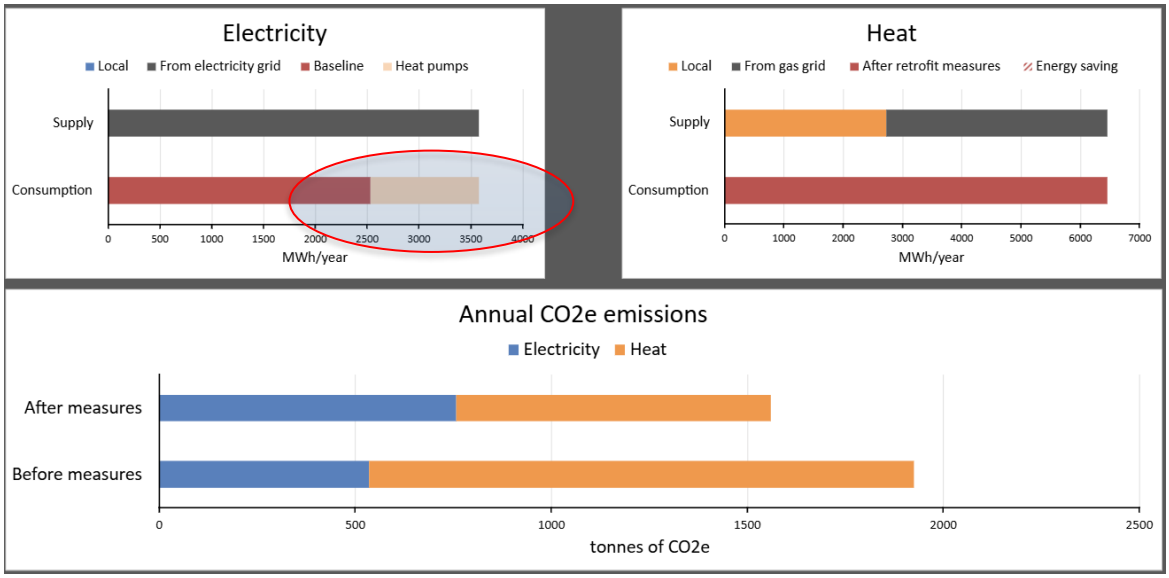


Impact of 35% of local homes having 10-12 solar panels

Whilst 75% of Boxgrove homes are technically suitable for solar panels due to south, east or west facing roofs the group reduced the figures to 30-40% based on visual concerns and acceptability and imagined a future where 35% of homes had solar on their homes. The graph above show that this amount of solar would meet about a quarter of the parish's demand.

Heat pumps

The same group discussed the final technology, domestic heat pumps. The group were interested in heat pumps though there were concerns about whether they work properly, and several people said they didn't know enough about them to have a strong opinion. There were also concerns about retrofitting which can be costly.



Impact of 50% of local homes having an air source heat pump

For the purposes of the exercise the group looked at what the impact would be if 50% of local homes installed a heat pump. The above graph illustrates that with this level of uptake, heat pumps would meet almost 50% of the heat demand (see the orange line in the heat graph) for the parish whilst reducing carbon emissions from heat production. Heat pumps do use electricity so that would drive up demand for electricity (see the circled bar on the first graph). However, heat pumps produce three to four times as much heat as they use in electrical energy so they are a critical part of decarbonising how we heat our homes.

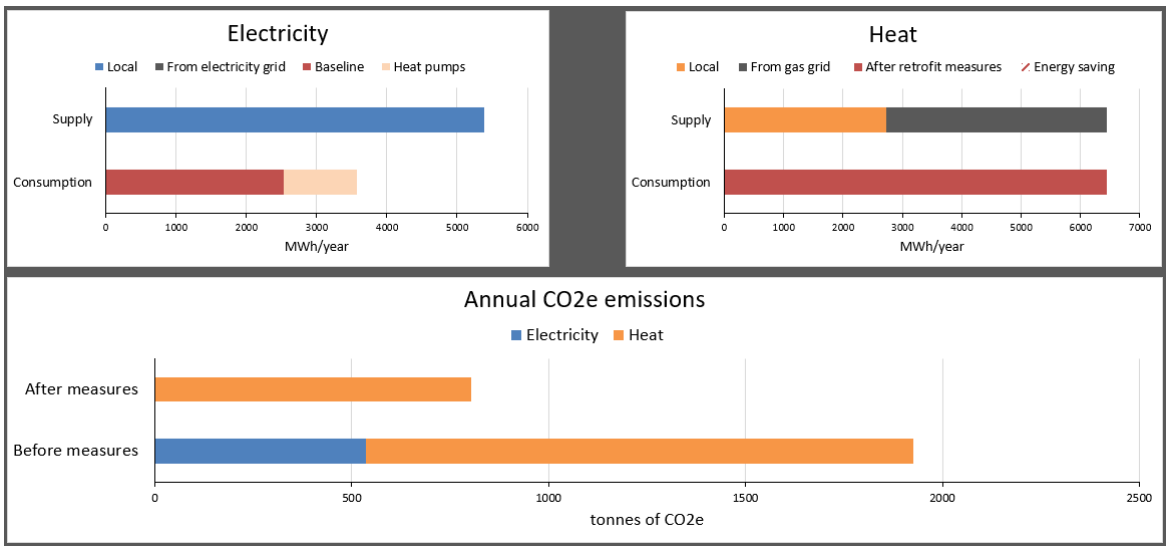
The wider discussion included the following points:

- Producing heat from a gas or oil boiler is currently the most carbon-intensive activity in homes, because it involves burning fossil fuels. Heat pumps use electricity, which can be generated from renewable sources. They're also very efficient—air source heat pumps are around 300% efficient (ie they generate about three times as much heat energy as the electricity they consume). A fossil fuel boiler is about 90% efficient, meaning it wastes some energy.
- It was considered incorrect that insulation levels need to be extremely high for heat pumps to work. There are examples of heat pumps being installed and being efficient in two-hundred-year-old stone-built properties with double glazing, loft insulation, and draught-proofing and being installed in 1930s ex-council houses with cavity wall insulation.
- The government currently offers a £7,500 Boiler Upgrade Scheme grant, which is useful, though it doesn't always cover the full additional cost of installation.

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. To demonstrate this, we included:

- 2 x small wind turbines
- 1 x 12 acres of solar farm
- 35% of homes with 10-12 solar panels
- 50% of homes with an air source heat pump



Boxgove's Future Energy Landscape

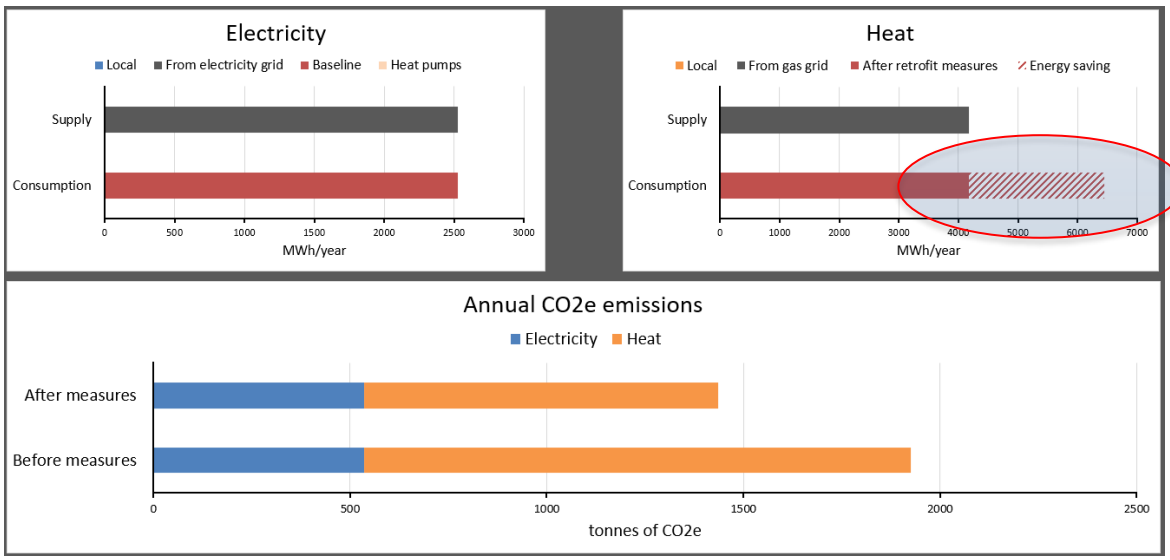
By reimagining the local energy system in this way Boxgrove could hypothetically be emitting less than half the current carbon emissions, producing more electricity than is needed and meeting about half the heat demand.

Retrofitting

Moving away from energy generation to reducing energy demand. This is an important aspect of the energy transition. If Boxgrove homes were more energy efficient—if they lost less heat—we wouldn't need to produce as much energy to heat and power our homes

The CESAR tool can demonstrate this, and we looked at 3 three different types of Boxgrove housing that have different levels of insulation and energy efficiency. We suggested that 25% of Boxgrove homes were built pre-1930, about 40% were built between 1930-1990 and 35% modern homes built after 1990.

The below heat graph, with the dashed red bar (highlighted with a circle), demonstrates that energy efficiency measures like upgraded with modern levels of wall insulation, loft insulation, draught-proofing, double glazing can reduce heat demand. The proposed retrofit could reduce the total heat demand by almost a third.



Impact on the heat demand following a local retrofit programme

Conclusion and recommendations:

It was a great to have the local people of Boxgrove come together to share their thoughts about different renewable energy technologies and learn from each other about how the different technologies work and what could be acceptable where they live.

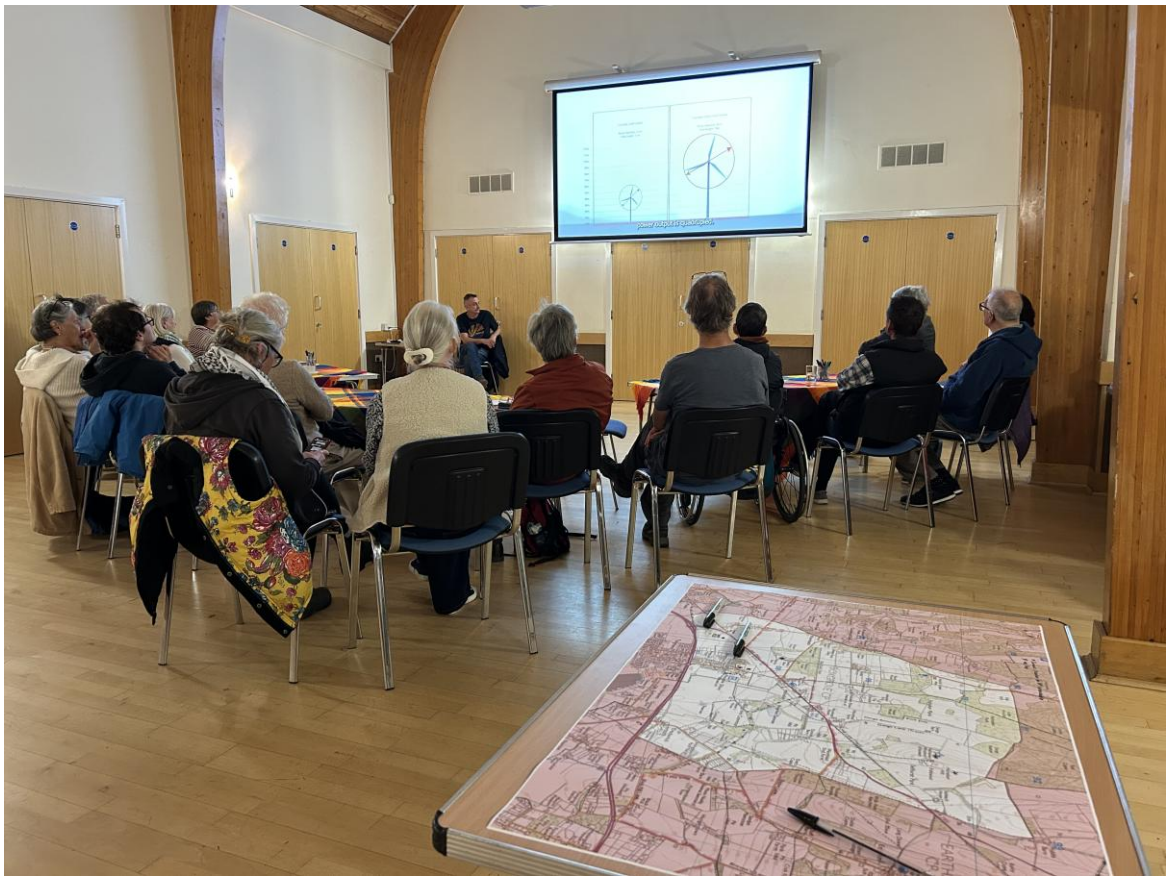
This was a hypothetical conversation where we put to one side constraints such as planning, cost and grid capacity. These are very real practicalities, particularly in the South Downs National Park and would have to be considered to initiate a future community energy project.

The idea is to provoke local awareness and spark ideas about how we can all play our part in the energy transition. Here are a few suggestions from the workshop that the local community might take forward:

- Share this report and Boxgrove community survey more widely so that as many people in the local community can share their thoughts.
- Map out sites for the proposed 5 solar farms and explore conversations with local landowners about the potential for solar.
- Introduce local trusted installers to the school and support a project to get solar on the school roof.
- Support local farmers to identify feasible roof space for solar generation.
- 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.
- 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 the new affordable housing in Boxgrove.

There is no simple solution, but this workshop format demonstrates how people learning together in their local context can shape local action. Sometimes these community conversations open local possibilities about generation projects, but they also highlight 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

Tools

Future Energy Landscapes: toolkit here

CESAR (Community Energy Saving Renewables) 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

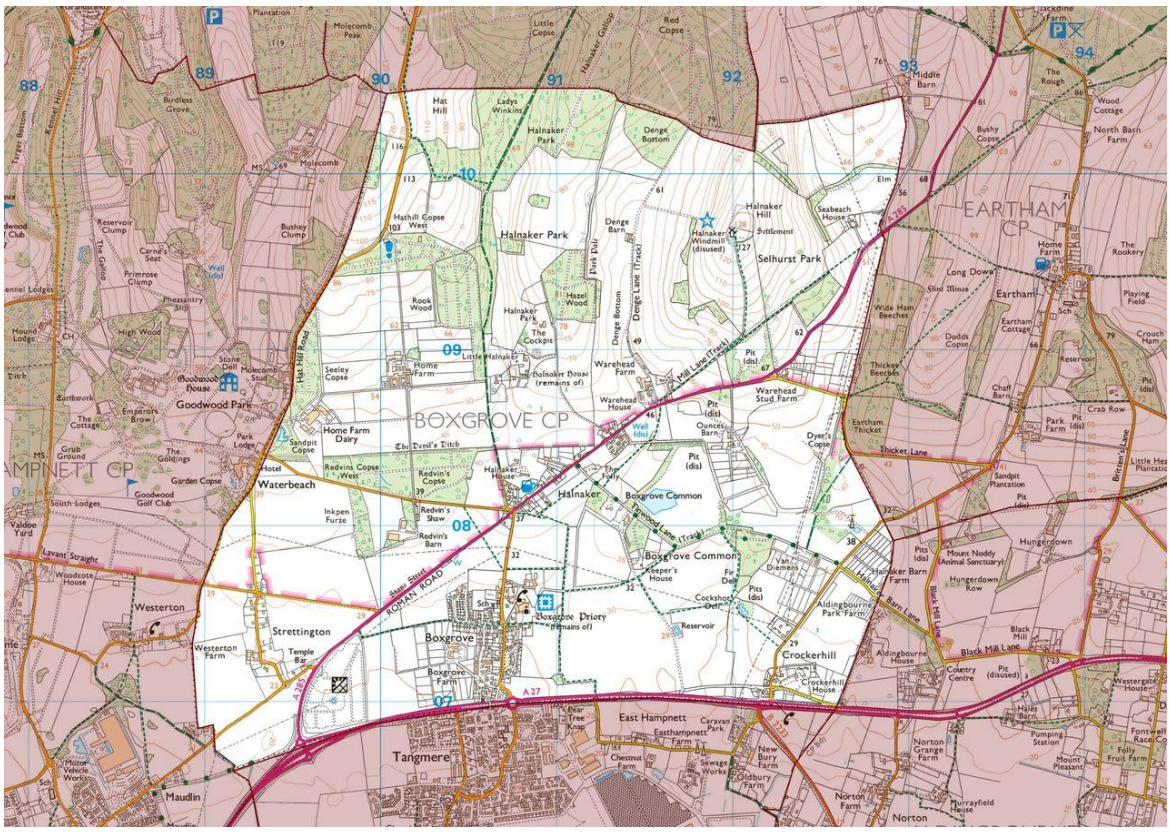
West Sussex County Council (2024) Energy Strategy 2024

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

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.


BOXGROVE CP
EARTHAM CP
Halnaker Park
Halnaker
Boxgrove Common
Boxgrove Priory (remains of)
Boxgrove
Tangmere
Maudlin
Westerton
Strettington
Waterbeach
Goodwood Park
Goodwood House
Goodwood Golf Club
Selhurst Park
Halnaker Windmill (disused)
Halnaker Hill
Warehead Farm
Warehead House
Warehead Stud Farm
Home Farm Dairy
Home Farm
Halnaker House
Halnaker Barn Farm
Aldingbourne Park Farm
Aldingbourne House
Crockerhill
Crockerhill House
East Hampnett
Easthampnett Farm
Caravan Park
Chestnut Farm
New Bury Farm
Oldbury Farm
Norton
Norton Farm
Norton Grange Farm
Earthamcottage
Eartham Thicket
Thicker Lane
Long Down
Hungerdown
Mount Noddy (Animal Sanctuary)
Hungerdown Row
Black Mill Lane
Roman Road
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