Future Energy Landscape Workshop

Wednesday 19th June 2024, Liss

This note summarises what happened and what was said on the day by residents but cannot be assumed to be representative of the full range of opinion in the local community. The workshop should therefore be seen as the start rather than the end of the conversation. **Please read through this report and provide your views via our 5-minute survey here.**

It is important to note that the workshop was to enable a conversation about change and possibilities, barriers such as planning and grid capacity were intentionally left outside of the room. These workshops are using the Parish boundary to pinpoint the discussion around an area which 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. Liss Parish sits entirely within the South Downs National Park which is important context for this workshop.

Workshop Context

The Centre of Sustainable Energy has developed a workshop-based approach to involve local communities in considering what their local energy needs are, what aspects of their local community and landscape are particularly important to them, and what mix of renewable technologies might be appropriate and acceptable to local people.

With support from South Downs National Park Authority and East Hampshire District Council, Energise South Downs are leading this workshop in ten communities to discover the types and scale of renewable energy that could meet the needs of local people within their areas. Drawing on data and research the workshops explore what might be feasible and create space for an informed, balanced conversation about what communities feel is acceptable. See appendix 2 for details of the data, research and assumptions that have been used to build this workshop.

The aim of the workshops, follow up reports and surveys are to demonstrate that it is possible to develop a local vision for sustainable energy that is acceptable to the local community, and to use this as a springboard for project and policy development.

Why the Future Energy Landscape workshop?

- Transforming the way that we generate and use energy is key to reducing carbon emissions and tackling the climate emergency.
- Generating more energy from renewable sources like wind or sun, so we produce less carbon is critical to a transition away from fossil fuels.

- Developing these energy systems can lower our energy bills, reduce carbon emissions and increase energy security.
- Communities need to be engaged in an informed discussion about the different renewable energy solutions and about the types and scale of renewable energy projects that might be acceptable to local people.

Workshop summary

Attendance: 39 people registered, 24 people attended on the night – including a representative from East Hampshire District Council and one district councillor.

Workshop purpose: To explore renewable energy in our area and build a consensus on the type, size and potential location of renewable technologies that might be acceptable.

Process:

1) Map the local landscape, considering areas which are special or not and where energy infrastructure already exists.
2) Consider types of renewable energy that might be acceptable within the area from a selection of feasible options.
3) Choose locations where these technologies might be located, and the barriers to implementing them.
4) Understand the contribution each renewable technology or a combination of them, can make to the energy demands of the location (in this instance Liss)

What happened?

1) Mapping the landscape

Participants were first invited to reflect on our local area and gather around a large map. Using post-it notes people illustrated their relationship with the area and plotted where energy infrastructure is already part of our local landscape.

Positive / Cherished Places (orange and green post its)

- Allotments, River Rother
- Riverside Walk for walking/running/cycling
- West Liss Rec
- Newman Collard Tennis
- Community Centre

- Heathland
- Shipwrights Way
- Previous Water Meadows
- Rake Hangers
- View of Downs from playground
- Longmoor Ranges for recreation
- View across farmland to Longmoor Ranges

Negative places identified (red post its)

- Stink from sewage Farm
- Rake road substation always full of rubbish
- Motorway

Fig.1&2: Post-its showing areas of connection to Liss

Infrastructure

- Mast on Weavers Down
- Substations around the village
- Line of electricity pylons to the northeast of the village

2) & 3) Renewable energy technologies – where and how?

After watching short videos about the different renewable technologies available the group was invited to break into 5 different technology groups. Each group took on the discussion of how a particular renewable technology might be deployed to meet the community's energy needs. Each group discussed the scale of a potential development* and their comfort with the technology asking:

Fig.3: Introduction to the CESAR tool

- 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?
- How much does it reduce our energy demand?

Renewable technology groups were as follows:

Large scale renewables:

a) Wind Power
b) Solar Farm (12 Acres)
c) Anaerobic Digester with a District Heating Network

Domestic renewables:
d) Domestic Solar PV
e) Ground source & air source heat pumps

**The workshop preparation had already identified how much of any one technology could be deployed in each area based on the space available and groups were given a maximum amount of technology that would fit. See Appendix 1 for the information that each table received about their technology.*

Each group then fed back their reflections about the technology, and where they might be located. The open land in Liss was split into two zones to make it simpler for people to locate different parts of the landscape.

Fig.4: Map of Liss with Zones labelled

The group's suggestions on the amount of each technology were inputted into the CESAR tool [1] which showed how much energy or heat would be generated. It showed the participants the generation in relation to Liss' consumption and the impact that it has on the areas carbon emissions.

The groups suggested the following scale (and locations) for each technology and the results from the CESAR tool (the amount of heat / power generated) are also shown.

[1] 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.

Renewable technology	Scale & generation	Location (& further comments)	Discussion notes
a) Wind Farm	1 large or 6 small would supply large % of our energy needs but didn't feel that there is a viable site in this area	The only site considered to have potential for a wind turbine was Weavers Down where there is already a tall mast. This is MoD land. However, this mast is visible for miles around, so one can assume a wind turbine would also be highly visible. Some people had no problem with this. The person most vocal against this was involved with including Liss in the National Park and ensuring impact on views was a key consideration for being a National Park. Liss is a valley – below Hill Brow on one side and Hawkley on the other side, lots of trees.	**Acceptability score:** Range of views from 1 to 5 (3 people at 4 or 5, one person at 0) Liss is known as the 'hidden village', and there was some concern about the impact that wind turbines would have on views. There were mixed views on whether the wider community would share concerns on the impact on views (3 of the 4 didn't mind the look of turbines, 1 person strongly against turbine under any circumstances). Concerns - Lack of knowledge about impact on bird and bat deaths - would like more research / evidence on this. - Noise - would like reassurances there would be no or minimal noise impact from turbines. - Lifespan of wind turbines and non-recyclability of turbine blades. - One view was that there are other sources of energy that would be much better to provide carbon free energy nationally rather than small scale locally - such as nuclear (which wouldn't be possible or acceptable in Liss)
b) Solar Farm (12 acres)	No consensus, some not keen to use agricultural land for solar, others were keen to install but weren't residents of	No locations were identified.	Acceptability – no consensus, there was a range of views from acceptable to unacceptable. Members of the group felt this would be encroaching on landscapes and once it was installed it would set a precedent for more to be installed. There was concern about using agricultural land for solar.

	Liss so didn't feel their view was as valid as a resident of the parish.		Rooftops of agricultural buildings and car parks should be maximised first. One member felt this would just be change for change's sake and not necessary. Some found it acceptable but were very aware that others wouldn't find it acceptable. **Barriers** Ecology improvements How could it be combined with agriculture and grazing?
Renewable technology	**Scale & generation**	**Location (& further comments)**	**Discussion notes**
c) Anaerobic Digester with district heating scheme	No. It could be part of an overall solution but needs more exploring and the contribution of waste identified.	Southern Water at sewage works? Where will pipes be laid? Can it be combined with ground source heat pumps? Can current gas pipes be used? Can digester be in a separate location from CHP unit, so heat would not need to be piped very far?	Acceptability Score – very mixed but average came out at 4.2 Still lots of questions around this technology. AD could use household waste and sewage as well as grown crops. Would be useful to know what quantity waste could contribute as it would mean less growing space needed. There would be 200 acres allocated to growing crops for the digester which could be used to grow food instead. Minimal visual impact on the landscape. Would need to know what the land is currently used for and what the disadvantages are with repurposing.
d) Domestic Solar PV	40% (out of 75%), approx. 1,120 houses on *Generation: 40% of domestic rooftops*	Brows Farm Railway Industrial units next to the train station All public buildings - schools, GP surgery, flats	Acceptability Score – 3.5 Comfortable generally if in the right place. Different tech available to be explored, PV tiles, stickers. Would be great if they could feed into microgrids for community use. **Barriers** National Park

	would provide enough power for 20% of the homes in Liss	Hilliers garden centre - Rake Blue Diamond centre	Some people are resistant to change Funding, it will need to be incentivised/made cheaper.
Renewable technology	**Scale & generation**	**Location (& further comments)**	**Discussion notes**
e) Air Source and Ground Source Heat Pumps	10% of homes fitted with ASHP 5% of homes fitted with GSHP *This would meet 10% of Liss' heat demands, reducing CO2 emissions, but increasing electricity demand.*	Individual homes	Acceptability Score – 3.5 Not perfect, expensive for homeowners, availability of space. Easy to hide so not too visible and only small locations needed. It wouldn't affect the landscape. Straightforward/easier measure/ modular to roll out. **Barriers** High up-front cost. Difficult in more densely populated areas. New developments should have District Heating Schemes

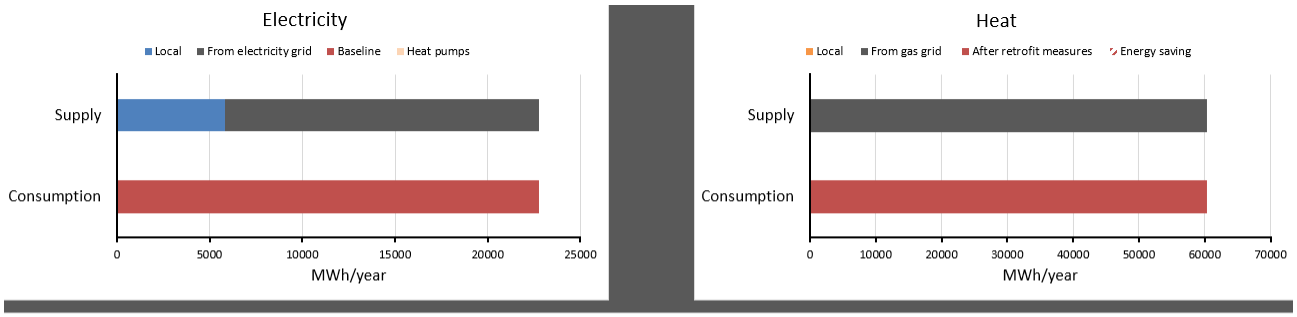
Scenarios

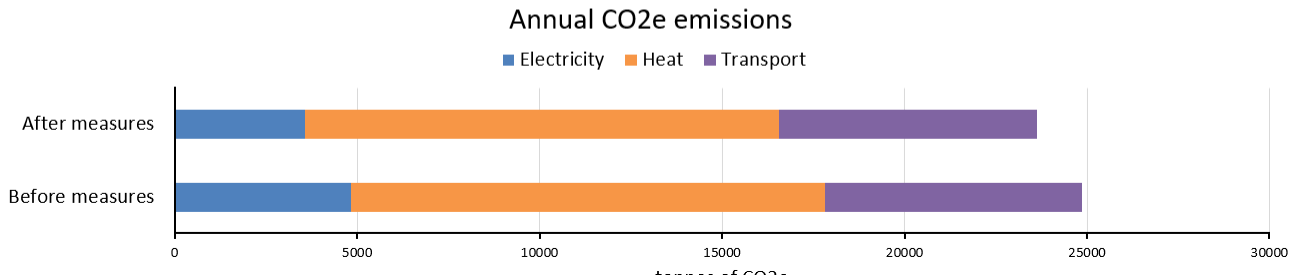
After the group's feedback they were then able to model different combinations of the technologies to see the effects on Liss' supply, consumption and CO2 emissions.

1) **Wind Power, 1 large 2.5MW turbine**

There was a consensus in the room that wind was not acceptable in Liss, due to its location in a valley, its situation in the National Park and the lack of space due to tree cover however, one member requested to see what 1 large wind turbine could contribute to the energy demand of Liss. 1 large wind turbine would produce one quarter of the electricity that Liss consumes currently and reduce the CO2 emissions

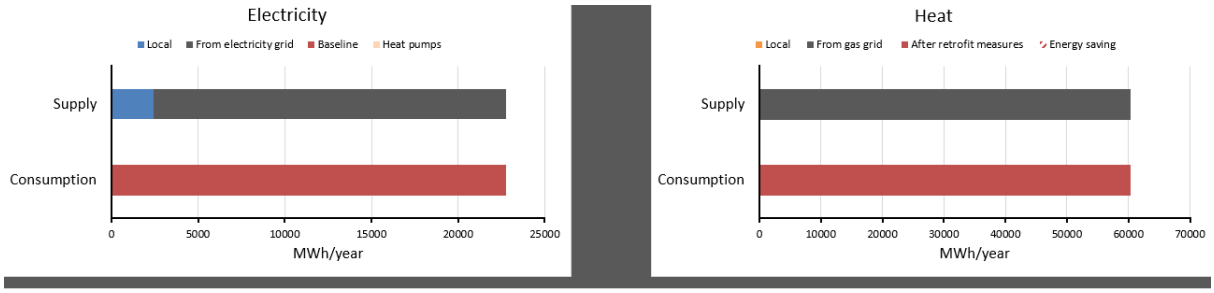
by approx. 1,000 tonnes per year.

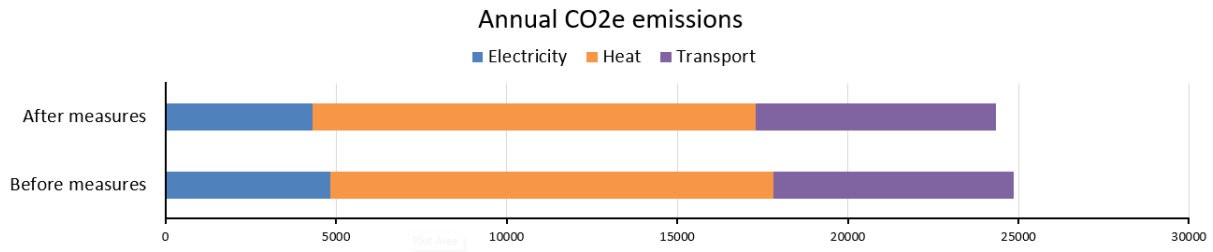




2) Solar Farm (12 acres)

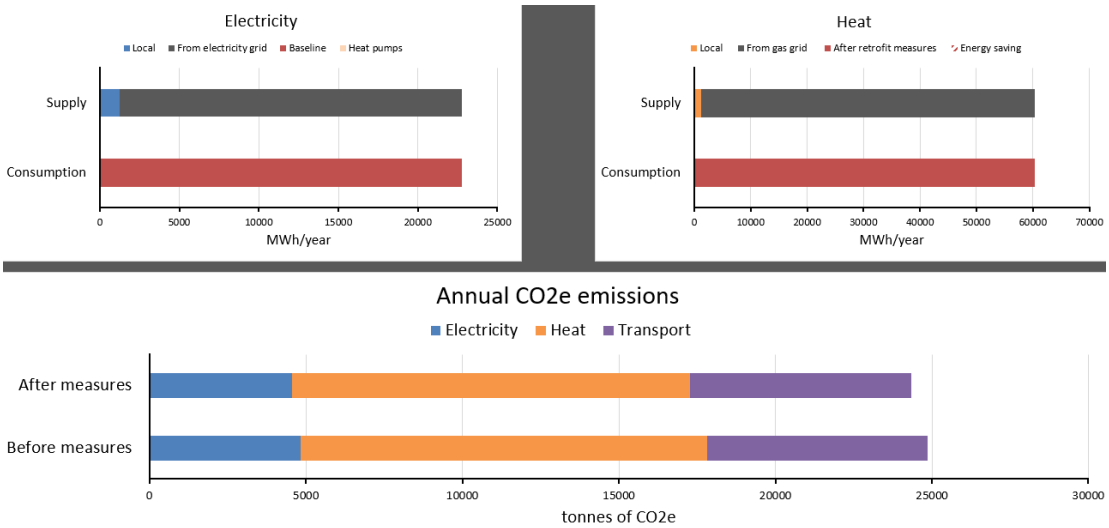
Again, there wasn't consensus in the room that a solar farm in Liss would be acceptable, however, for the purposes of comparing renewable sources the group was shown how much one solar farm could contribute to its electricity needs. In this scenario, one solar farm of 12 acres would produce an eighth of Liss' electricity demand and would reduce its CO2 emissions slightly.





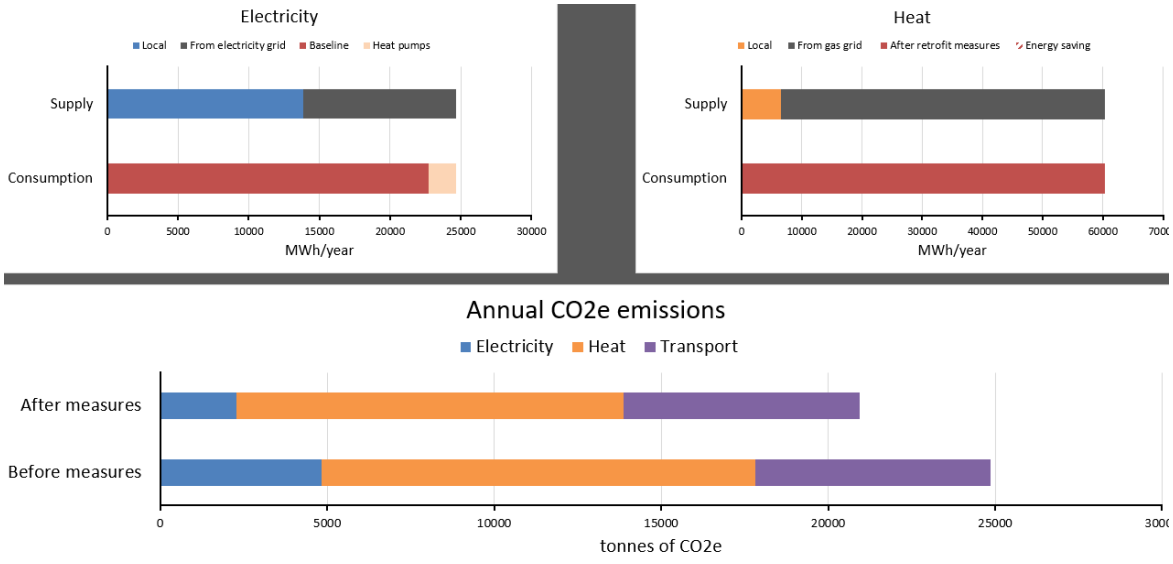
3) Anaerobic digestor

There was interest from the group to explore the potential of an anaerobic digestor, and in particular to explore the use of waste from the sewage plant and domestic kitchen waste. An anaerobic digestor would produce 5% of Liss' electricity needs and 2% of the district's heat needs.



4) Combination of all technology discussed - heat pumps (10% of homes with an ASHP and 5% of homes with GSHP), domestic solar PV on 40% of rooftops in Liss, 1 solar farm, 1 large wind turbine and 1 AD.

This scenario shows all the technologies discussed and how they would contribute to the electricity demand and heat demand for Liss. The installation of all the technologies listed above would reduce Liss' CO2 emissions by 4,000 tonnes per year and would power all the homes in Liss (plus 300 more!). Even with the increased electricity demand from electrifying our heating systems, we can still produce over half of the electricity needed by installing these renewable solutions.



Conclusion

There was a wide range of views in this workshop, and many opposing views. There was concern in the group about the villages situation within the National Park and how renewables may affect the views and landscape around the village, alongside acceptance from many in the room that we need to transition away from fossil fuels.

There was a feeling that other opportunities for renewable generation were missed in the discussions, such as nuclear power on a large scale (produced elsewhere as the National Park is protected), and smaller scale hydro electric generation from the waterways within the parish which would have less of a visual impact on the landscape.

The use of Solar Farms was undecided with many of the group in support but others feeling strongly that installing one solar farm would set a precedent for others to follow. The group all agreed that rooftop solar possibilities should be maximised first before using agricultural land, including looking at solar generation on car park roof tops and all public buildings.

Onshore wind was discussed and there were a wide range of views. One member described Liss as the "hidden village" so was strongly against wind turbines due to their impact on views in the South Downs National Park. Others in the group were interested to explore how wind could contribute but most agreed the only possible place for wind turbines would be on Weavers Down where a mast already stands and is MoD land.

Installation of domestic solar PV and heat pumps was supported as it wouldn't affect the landscape, but the barriers to implementation were discussed, including the upfront cost to the homeowners. The group opted to be quite conservative with their aims for domestic heat pumps and solar panel roll out, they felt the financial incentives need to improve first.

There was interest in an Anaerobic Digester for Liss, with the group wanting to explore a bit more about how domestic waste and sewage from the sewage plant could be used to produce power for the area. The group were supportive of the fact that visually an AD wouldn't change the landscape, but they did feel that if crops were grown for the digestor that more land would be required to ensure enough space for adequate crop rotation.

At the end of the workshop the participants acknowledged the important role that retrofitting has in reducing the overall demand, meaning less energy generation is needed. Simple measures like draft proofing, insulation and double or triple glazed windows to improve the energy efficiency of the lowest performing houses would reduce the overall demand significantly.

The workshop participants spent two hours imagining how renewables might meet our local populations energy needs. They shared what they wanted to protect in their landscape whilst exploring what might be possible if various combinations of renewable technologies were deployed. This was a hypothetical conversation based on data and research to open possibilities and enable people to learn together about what the different technologies are, a little about how they work and to feel part of an important conversation happening nationally about how we must transition away from fossil fuels.

ENERGISE SOUTH DOWNS

Appendix 1 - Information on technologies provided to the groups to inform their discussions

Wind Power

Small turbine
500 kW installation
Powers 270 homes over a year
Hub height: 40m / Rotor diameter: 35m
250 tonnes annual CO_2e saving

Medium turbine
1000 kW installation
Powers 540 homes over a year
Hub height: 70m / Rotor diameter: 55m
500 tonnes annual CO_2e saving

Large turbine
2500 kW installation
Powers 1,350 homes over a year
Hub height: 100m / Rotor diameter: 80m
1,240 tonnes annual CO_2e saving

Liss carbon emissions
Total produced each year from electricity and heat
18,000 tonnes
2,800 homes
6,300 people

Domestic solar photovoltaic (PV)

- Supplies electricity direct by connecting to your fuse board
- Solar panels are normally mounted on the roof
- South facing is optimum but west / east orientation also works
- Planning permission is a notification process which is generally accepted in the SNDPA
- Connection permission not required from power company
- MCS accredited installer needed
- Max permitted output 3.8kW (net) = 8-10 panels*
  (* no. depends on make of panels)

Indicative numbers:
- 4 kW installation
- Powers approx. 0.9 homes over a year
- Approx. 0.8 tonne annual CO_2e saving

Liss carbon emissions
Total produced each year from electricity and heat
18,000 tonnes
2,800 homes
6,300 people

Solar farm

- Solar farm has ground mounted PV panels, usually fixed, with an appropriate orientation and elevation.
- PV panels can be raised to allow livestock, usually sheep, to graze below.
- Solar farms well placed on low agricultural land or brownfield sites

Indicative numbers:
- 12 acres of land area required
- 2,500 kW of power
- Energy for 555 homes over a year
- 510 tonnes annual CO_2e saving

Liss carbon emissions
Total produced each year from electricity and heat
18,000 tonnes
2,800 homes
6,300 people

Combined heat and power (CHP) with anaerobic digestion

Anaerobic digestion uses biological process to 'digest' crops or animal or food waste to produce methane gas.
Your landscape is unlikely to change with this technology as the land could be taken up with crops.
The gas is used in an engine/turbine to generate electricity and recover heat.
Engines/turbines can be sensitive to quality of gas (fuel) used so supply should be of consistent quality.
One installation will generate 1 MWh of both heat and power providing heat for 100 homes and power for 285 homes
530 tonnes of annual CO_2e savings in total

Liss carbon emissions
Total produced each year from electricity and heat
18,000 tonnes
2,800 homes
6,300 people

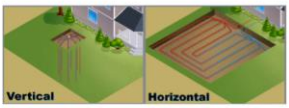
Air/Ground Source Heat Pumps

Air Source Heat Pump

7.5 kW installation
Provides all heating for efficient home
1 unit of electricity to power the heat pump = 2.6 units of heat generated
1.6 tonnes of annual CO_2e savings

Liss carbon emissions
Total produced each year from electricity and heat
18,000 tonnes
2,800 homes
6,300 people

Ground Source Heat Pump
6 kW installation
Provides all heating for efficient home
1 unit of electricity to power the heat pump = 2.9 units of heat generated
1.7 tonnes of annual CO_2e savings



Appendix 2 - Tools, assumptions and research

Tools

Future Energy Landscapes: toolkit here

CESAR 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

Ridett, E., and Anderson, B. (2023) An assessment of the wider Hampshire distribution network capacity and potential constraint points for renewable generation (v1.0) Southampton: University of Southampton.

Ridett, E., and Anderson, B. (2023) An updated assessment of the technical and economic potential for renewable electricity generation in the pan-Hampshire area (v2.0). Establishing a Robust Evidence for a Pan-Hampshire 2025-2050 Energy Strategy project report. Southampton: University of Southampton.

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

Petersfield Climate Action Network & Alton Climate Action Network (2023) East Hampshire District – Green House Gas Emissions Based on the DESNeZ 29 June 2023 data release