Workshop Summary

Renewable Energy in Nailsea and Tickenham

12th February 2022

Nailsea Tithe Barn

1. Summary

North Somerset Council is committed to becoming carbon neutral by 2030 and would like to increase local renewable energy generation and include more supportive renewable energy policies within its emerging local plan. A public workshop was held on 12th February 2022, exploring whether renewable energy development could be increased in Nailsea and Tickenham and what might be acceptable to residents. The workshop was facilitated by the Centre for Sustainable Energy, with a member of staff present from North Somerset Council as an observer.

Twenty-one residents attended the workshop, of whom nineteen stayed for the full duration of the event.

This note summarises 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. A public consultation is being held to capture wider public opinion, and then a report will be prepared for the Council summarising the overall outcomes and giving recommendations for how the Council's planning policies for renewable energy might address the aspirations and concerns of residents. The forthcoming local plan consultation will then give residents further opportunities to influence emerging policy.

It should also be added that the workshop outputs are high level suggestions of what *might* be acceptable, but any policies (and any future planning applications) would require further detailed scrutiny. This would ensure that what's envisaged would be feasible, and would consider the impact on the landscape, noise impacts, disruption from construction traffic, and wildlife protection.

2. Community Energy Plan

Workshop participants commented that the following types and scales of renewable electricity technology might be acceptable:

Renewable Electricity

- **Wind turbines -** The installation of large-scale wind turbines with a tip height of 130 – 140 metres (up to 2.5 megawatt in output) to the western edge of Nailsea Moor, towards the motorway. Workshop participants supported the installation of up to 2 turbines of this scale in this approximate location. The group's suggestions regarding suitable locations and scales for onshore wind turbines were informed by mapping of the technical potential for small (500 kilowatt), medium size (1 megawatt) and large commercial scale turbines (2.5 megawatt). Parts of this mapping are attached in the body of the report below.
- **Ground based solar farms** – up to 20 megawatts in size, covering 90 acres, the equivalent of around 40 football pitches.
- **Anaerobic Digestion** - 1 x 500 kilowatt Anaerobic Digestor if sufficient feedstock could be found. No location was discussed.

- **Rooftop solar photovoltaic (PV) panels** - Up to 200 domestic rooftop solar PV panel installations (4 kilowatts each installation)

Renewable heat

Workshop participants commented that the following types and scales of renewable heat generation might feasibly be installed out by local homeowners in the next five years:

- Domestic (rooftop) solar thermal panels: on 5% of homes, around 370 installations.
- Domestic air source heat pumps: on 15% of homes, around 1120 installations.
- Domestic ground source heat pumps: on 5% of homes, around 370 installations.

- Support was also expressed for the potential use of mine-water (within the historic mines under Nailsea) as a heat source for a district heating network for up to 100 homes

Energy Saving Measures

Workshop participants also thought the following energy saving improvements could be carried out by local homeowners in the next five years:

Low-cost improvements (£200 – draught proofing) for 65% of all homes, 14,550 in total

High-cost improvements (ranging from an average of £5,700 - £12,800 and including a mix of draught proofing, loft insulation, triple glazing, floor insulation, cavity wall insulation and external wall insulation)

- Old houses (pre to 1930s): 370 homes (5% of total in Nailsea and Tickenham)
- 20th century houses (1930 to 1990): 370 homes (5% of total in Nailsea and Tickenham)
- Modern houses (1990 – present): 1490 homes (20% of total in Nailsea and Tickenham)

Overall impact

Renewable electricity generation

The renewable energy (wind turbines, solar panels, solar farms, anaerobic digestor) suggested in the workshop would result in Nailsea and Tickenham generating approximately 72% of electricity used in the two parishes from local renewable sources. This would reduce emissions by 8506 tonnes of carbon (CO2e).

Renewable Heat Generation and Energy Saving

The suggested renewable heat technologies would provide 12% of Nailsea and Tickenham's annual heat demand, reducing emissions by 6078 tonnes of carbon (CO2e). The suggested level of energy efficiency improvements would reduce heat consumption with the two parishes by 6%. Together these changes would reduce carbon emissions from heating by approximately 19%.

Overall impact on carbon emissions

Overall the renewable energy technologies and energy efficiency measures suggested in the workshop, if taken forward, would reduce the carbon emissions from the two parishes by approximately 23% (14,583 tonnes CO2e).

3. Summary of workshop sessions

Landscape

Following a brief opening session dealing with the framework for the day and introductions, workshop participants were asked to create a map reflecting their relationship to the local area. Once drawn, each participant then added coloured post-it notes to their personal maps: yellow for positive places or services in the local area, blue for those with negative associations and pink for those which had been important which have now been lost. Finally, these post-it notes were added onto one large communal map of the two parishes.

Every personal map differed in size, geography and important features according to the life stage, habits and interests of its creator. Nevertheless, there were common themes, enabling an overall sense of the 'neighbourhood' of the people in the room and areas that were particularly cherished or valued.

There was a mix of views. Some people had a strong attachment to the place and identified a strong sense of community. Others felt more contingent, either due to the way the area had developed, or because they had recently moved to the area. Some attendees were doubtful as to whether the workshop and consultation would have any impact on what the council ultimately do, and one resident left his personal map blank, expressing cynicism about North Somerset Council.

In Tickenham, the sense of community came across less strongly. One participant commented that you might be living there for 20 years, and then go into the village hall and be asked whether you'd just moved to the area. Some attendees felt Tickenham to be a commuter village, and it was evident

that the volume of traffic passing through discouraged social interaction, with traffic noise being so high that you can't have proper conversation on Clevedon Road.

Positive / Cherished Places

- Tickenham moor (for walking)
- Cherished view from Clevedon Road South over Tickenham Moor
- Backwell Common / Lake
- Morgans Hill – popular walking place
- Walking way to the east of Nailsea
- Good countryside for cycling near the West End and Nailsea Moor

Negative places identified:

- Heavy traffic along Clevedon Road – too loud for conversation

Participants identified the high voltage line passing through the area to Hinkley Point, though it wasn't seen as particularly negative by the majority of the group

"Lost" places or infrastructure

- Independent shops
- Fields lost to housing

There was lively discussion about traffic in the area, with the group feeling it detracted from the sense of community, but disagreement as to what could be done about it.

Emotions attached to the landscape

Using large pink post-it notes, participants were tasked with describing their local landscape and countryside with descriptive words (e.g. wild, beautiful, ugly); activities that they associate with the landscape (e.g. farming, hill walking) and; emotions (e.g. how they feel when they're out in the local countryside). The post-it notes were then attached to the communal map, and contained the following thoughts:

- Beautiful open moorland and mill
- So lucky to have Backwell Lake
- Tranquility
- River Kenn: Wildlife and walking corridor
- Beautiful views, farming, relaxing
- Pastoral landscape
- Historical buildings, tudor farmhouses
- Fresh air, quiet, distant views, friendly contacts
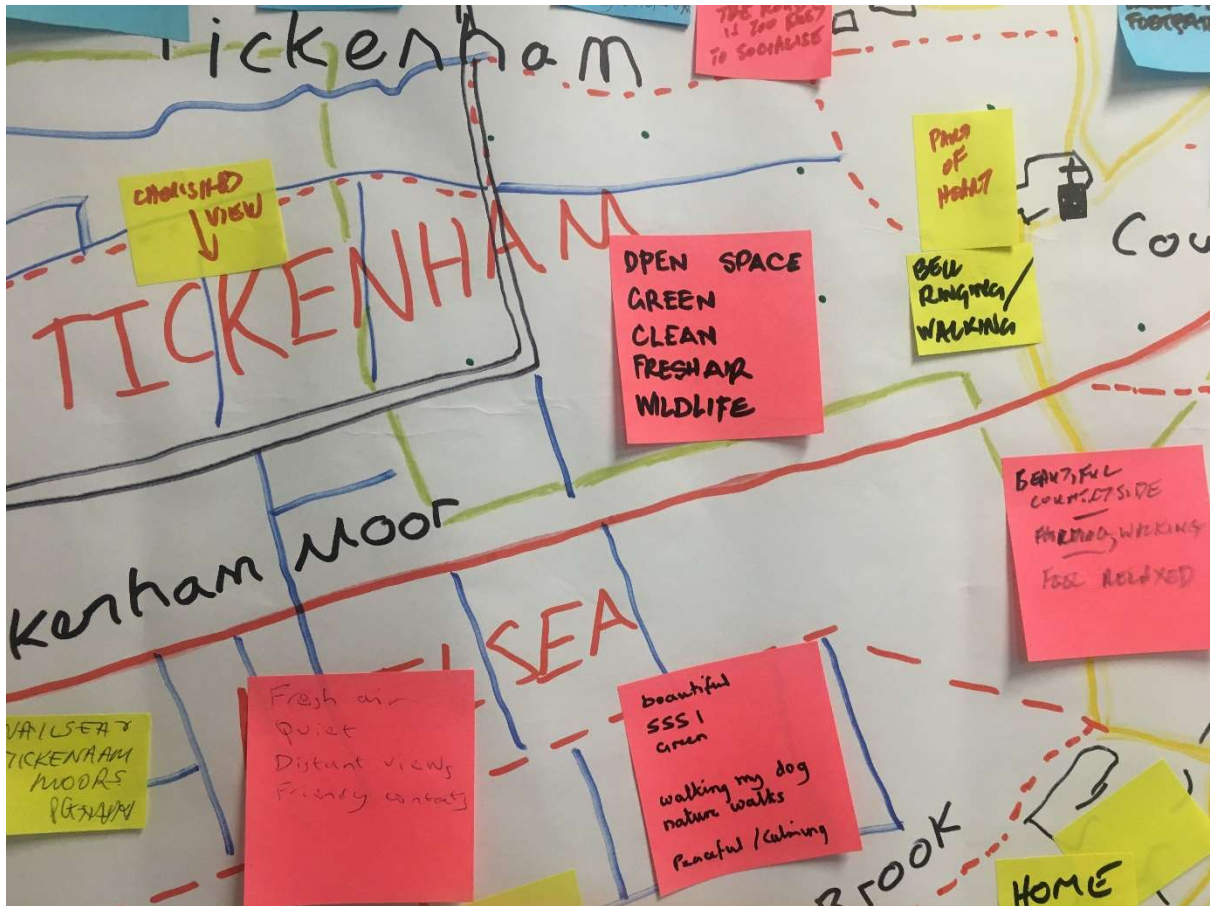
4. Community Energy Plan

Starting from nothing, participants were asked to suggest types and scales of renewable energy (represented by different cards) which might be acceptable. They chose these from a 'menu' of what might be technically suitable within the area, which had been informed by the renewable energy capacity study commissioned by North Somerset Council. The group was also shown the council's technical mapping of suitable areas for onshore wind and solar, see appendix A.

Favoured technologies were placed on a table, and then the group discussed whether each individual suggestion was acceptable to the group. In this way, the workshop outputs were agreed by the group as a whole.

As technologies were selected, they were entered into a spreadsheet, designed to let attendees see the impact of their choices in terms of energy output, energy savings and carbon savings. This allowed comparisons to be made between different scales and types of technology. This was then used to devise a hypothetical community energy plan. As technologies were selected a large map on the wall was annotated with locations where specific technologies might be acceptable.
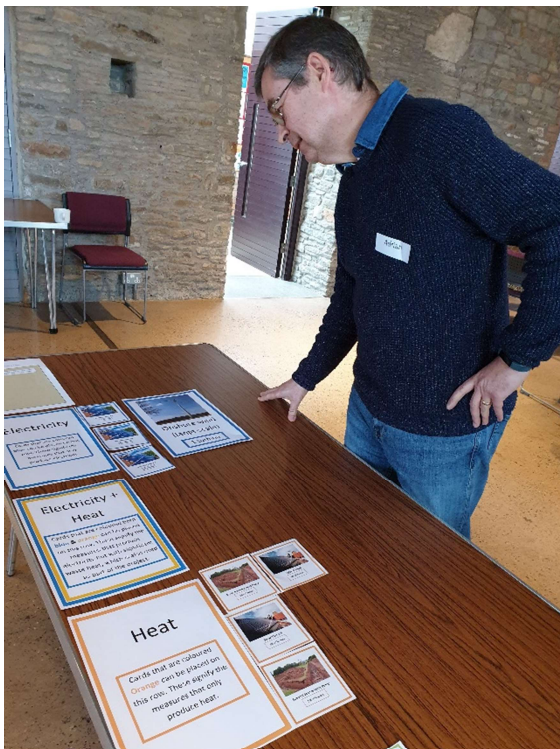
The key infrastructure proposals adopted in the Community Energy Plan for Nailsea and Tickenham were:

Renewable electricity

- **2 large scale (2.5 megawatt) wind turbines**, measuring between 130 - 140 metres in height. Each turbine would provide 11,651 megawatts hours of renewable electricity a year. This would power for about 1600 homes per year, per turbine, or 3,250 in total from both turbines. This is the equivalent to 43% of the two parishes' homes. Suggested location for these to be on the western edge of Tickenham Moor, close to the motorway. Sixteen people voted in favour of this proposal and 3 against.

  Below is a summary of the discussions around onshore wind:

  - The group discussed the key impacts of onshore wind in some detail, including noise impacts and ecological impacts (bird and bat strikes). CSE summarised the environmental impact assessment process that planning applications would go through. Also summarised was some of the evidence submitted with the planning application (in an environmental impact statement), for example noise studies and multi-season bird surveys or bat surveys.

  - There was concern about the areas identified for wind turbine potential included parts of the Nailsea Moor Site of Special Scientific Interest. The council's renewable energy study specifically excluded consideration of sites of special scientific interest.

  - Some attendees raised concerns about the grid infrastructure serving the wind farm and the visual impact of the infrastructure connecting the turbines to the grid.

  - The group considered whether a larger group of smaller turbines (for example 5 x 1 megawatt turbines) would be preferable to 2 very large turbines. However they concluded that a smaller number of larger turbines would be preferable in terms of overall visual and landscape impact. They also acknowledged the greater power output of large turbines.

  - There was discussion about ownership models and the difference between private developers and community ownership models. For example where the community owns and develops the renewable energy asset, any "profit" is reinvested in the local community rather than taken by shareholders. The group did not however express that the turbines should only be community owned.

- **A solar farm or farms, up to 20 megawatts in size.** This would power the equivalent of powering 5371 homes (71% of all homes in the two parishes) and would cover

approximately 90 acres, the equivalent of around 40 football pitches. No location was identified for these. Eleven people voted in favour of this proposal and 4 against.

Below is a summary of the discussions around solar farms:

- One participant expressed a preference that solar panels should be accommodated on roofs rather than in fields, or on roofs first. But the group as a whole accepted the need to have both rooftop solar and ground based solar farms.
- The group felt that the visual impact of solar farms was less as they could be hidden from view, but concerns were raised about their ecological impact. The group was keen the solar farm proposals should secure improvements in habitat provision and biodiversity and supported grazing beneath solar panels.
- Projecting an OS map on the wall, the workshop facilitators measured out roughly the area of land that would be needed to accommodate a 20 megawatt solar farm, so that attendees could get an idea of the likely impact of this scale of development.
- The group declined to identify specific locations that would be most suitable for solar farms, and was undecided as to whether it would be better to have one large 20 megawatt solar farm, or several smaller developments.
- The group raised concerns about the view south from Tickenham over the moors, identified in the earlier mapping exercise as a cherished view.
- Solar farms should not be near footpaths, should avoid the Site of Special Scientific Interest and should not impact wildlife.

- **Domestic solar photovoltaic panels:** 2984 installations, producing 11,503 megawatt hours of renewable electricity a year, the equivalent of powering 3206 homes (40% of all homes in the two parishes).

Below is a summary of the discussions around rooftop solar

- CSE clarified that the question related to rooftop solar on *existing* houses. Policy and regulation will soon require panels to be fitted to new buildings as a matter of course.
- Support was expressed for rooftop solar on large commercial buildings.
- Some participants questioned whether it was realistic that 40% of people would install rooftop solar, given the lengthy payback periods.

- One attendee expressed support for tidal lagoons in the Severn Estuary as being preferable to wind turbines being developed within their local area.

Renewable heat

- **Solar thermal domestic**: 373 installations (5% of homes in the two parishes), producing 560 megawatt hours of renewable heat, the equivalent of heating 52. Eleven people voted in favour of this proposal and 3 against.
- **Air source heat pumps**: 1119 installations (15% of homes in the two parishes), producing 12,044 megawatt hours of renewable heat, heating 1119 homes.

    - Several people in the group had air source heat pumps and expressed positive views of their experience.
    - There was significant discussion of the availability of funding to support their rollout, though North Somerset were expecting to bring out a £5,000 grant for heat pumps in April.

- **Ground source heat pumps**: 373 installations (5% of homes in the two parishes), producing 4015 megawatt hours of renewable heat, heating 373 homes.

- **Mine water heat**: heating 100 homes via a district heating network. The majority of the group expressed support for the possible development of a district heating network in Nailsea using water within the mines as a heat source, though questioned its likely feasibility. Support was also expressed for linking other heat sources into this heat network.

Energy Saving Measures

The following energy saving measures were also proposed by the group.

| House type	Number of installations	Energy saving (megawatt hours)	Cost
High-cost improvements including a mix of draught proofing, loft insulation, triple glazing, floor insulation, cavity wall insulation and external wall insulation)			
Old houses pre-1930	373 (5% of total in Nailsea and Tickenham)	3888 MWh	£4,776,814
20th century houses (1930 to 1990)	373 (5% of total in Nailsea and Tickenham)	1460 MWh	£2,633,402
Modern houses (1990 to present)	1490 homes (20% of total in Nailsea and Tickenham)	2361 MWh	£8,570,478
Low-cost improvement: draughtproofing			
Old houses pre-1930	4850 installations (65% of homes in Nailsea and Tickenham	1558 **MWh**	£969,923
20th century houses (1930 to 1990)	4850 installations (65% of homes in Nailsea and Tickenham	615 MWh	£969,923
Modern houses (1990 to present)	4850 installations (65% of homes in Nailsea and Tickenham	653 MWh	£969,923

5. Overall impact

In sum, the proposed changes would:

- Provide 72% of Nailsea and Tickenham's annual electricity demand from renewable sources
- Provide 14% of Nailsea and Tickenham's annual heat demand from renewable sources
- The suggested level of energy efficiency improvements would reduce heat consumption with the two parishes by 6%.
- Reduce the total carbon emissions from the two parishes by approximately 23% (14,583 tonnes CO2e).
- Cost roughly £70 million

Appendix A – Potentially suitable areas for onshore wind. Technical assessment. Except from RERAS study

The numbers on the map represent potentially suitable locations for 1 MW turbines
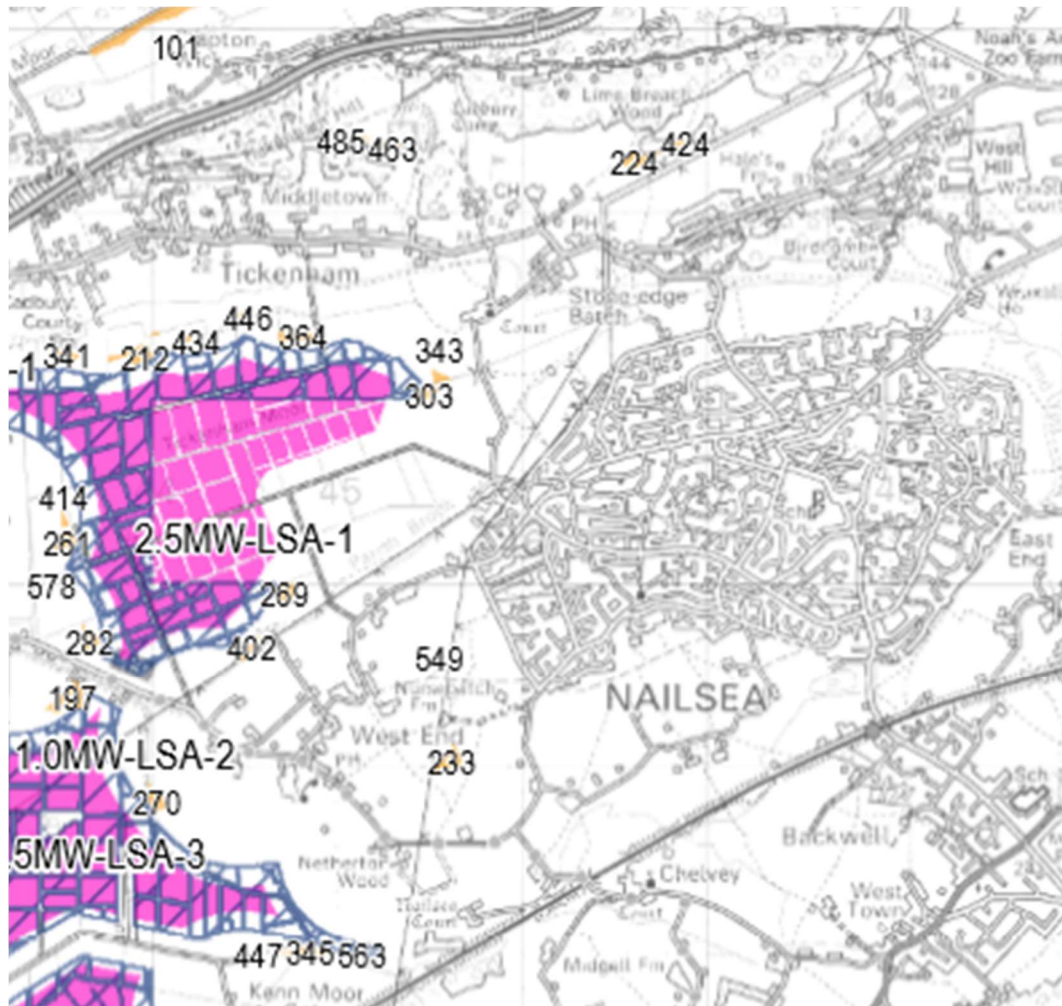

Technical capacity

6 X 2.5 MW turbines

11 x 1 MW turbines

24 x 500 kW turbines

Combined Wind Search – 0.5 MW, 1 MW and 2.5 MW - FIGURE W7-NS

Appendix B - Unconstrained areas for field based solar. Technical assessment. Except from RERAS study

This map illustrates the sites which in technical terms could be developed for solar farms. However, these areas will need to be refined further through the Local Plan process, taking into account other considerations and constraints, as part of developing a strategy for renewable energy development.
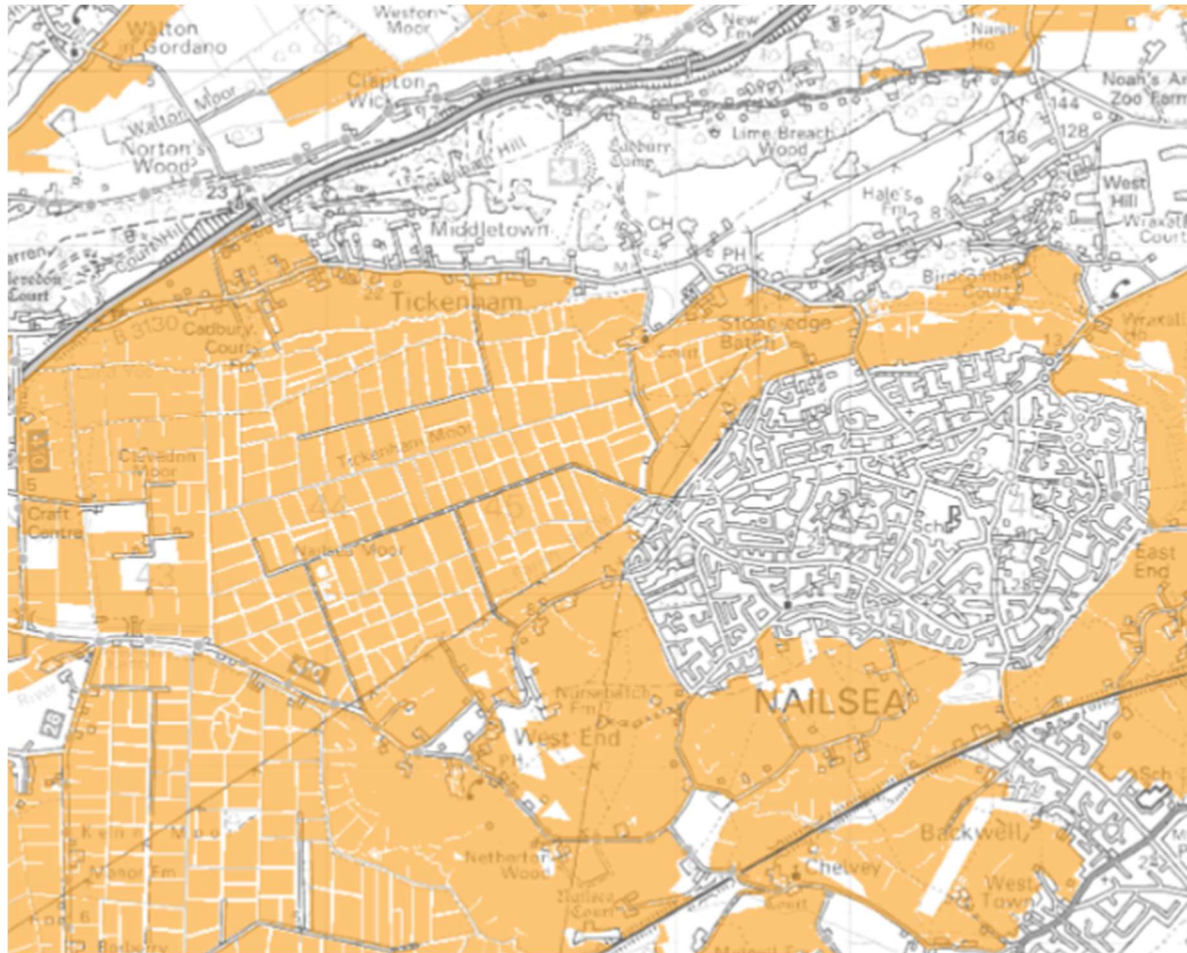
Appendix C - Completed spreadsheet of potentially suitable technologies, energy generated and saved and carbon emissions before and after

Technologies	Number of Cards	Number of installations		MWh supplied/saved Electricity	MWh supplied/saved Heat	Equivalent homes powered/heated	Cost
Onshore wind - small (500 kW / hub height: 40m / rotor diameter: 35m)	0	0		0	N/A	0	£0
Onshore wind - medium (1 MW / hub height: 70m / rotor diameter: 55m)	0	0		0	N/A	0	£0
Onshore wind - large (2.5 MW / hub height: 100m / rotor diameter: 80m)	2	2		11651	N/A	3247	£5,000,000
Hydro (200 kW)	0	0		0	N/A	0	£0
Hydro - micro (25 kW)	0	0		0	N/A	0	£0
Solar PV - domestic (4 kW) (1 card represents 5% of homes)	8	2984	40%	11503	N/A	3206	£15,518,767
Solar farm (2.5 MW / 12 acres)	8	8		19272	N/A	5371	£10,000,000
Anaerobic digestion (500 kW / 250 acres)	1	1		2637	N/A	735	£2,600,000
CHP - Anaerobic digestion (100 homes district heating)	0	0		0	0	0	£0
CHP - Geothermal, mine water (100 homes district heating)	1	1		1076	1076	300	£1,245,194
Water source heat pump (100 homes district heating)	0	0		N/A	0	0	£0
Solar thermal - domestic (1 card represents 5% of homes)	1	373	5%	N/A	560	52	£1,492,189
Air source heat pump - domestic (1 card represents 15% of homes)	3	1119	15%	N/A	12044	1119	£10,072,277
Ground source heat pump - domestic (1 card represents 5% of homes)	1	373	5%	N/A	4015	373	£5,595,709
Old home (pre 1930) - low cost (1 card represents 5% of homes)	13	4850	65%	N/A	1558	N/A	£969,923
20th century home (1930-1990) - low cost (1 card represents 5% of homes)	13	4850	65%	N/A	615	N/A	£969,923
Modern home (post 1990) - low cost (1 card represents 5% of homes)	13	4850	65%	N/A	653	N/A	£969,923
Old home (pre 1930) - high cost (1 card represents 5% of homes)	1	373	5%	N/A	3888	N/A	£4,776,814
20th century home (1930-1990) - high cost (1 card represents 5% of homes)	1	373	5%	N/A	1460	N/A	£2,633,402
Modern home (post 1990) - high cost (1 card represents 5% of homes)	4	1492	20%	N/A	2361	N/A	£8,570,478
EnerPHit (1 card represents 1% of homes)	0	0	0%	N/A	0	N/A	£0

Chart Area

Extra information

Total cost	
£70,414,601	

| Total equivalent homes powered | 12860 |
| Total homes in community area | 7461 |

After the 'Energy transition exercise'

| Annual local electricity supply [MWh] |
| 46139 |

| Annual local electricity consumption [MWh] |
| 63737 |

| Annual local heat supply [MWh] |
| 17694 |

| Annual local heat consumption [MWh] |
| 142279 |

| Smart Export Guarantee (SEG) tariff [p/kWh] |
| 5 |

| Potential annual SEG earnings |
| £2,306,936 |

Electricity — Supply/Consumption (MWh/year)
Legend: Local, From electricity grid, Baseline, Heat pumps

Heat — Supply/Consumption (MWh/year)
Legend: Local, From gas grid, After retrofit measures, Energy saving

Annual CO2e emissions (tonnes of CO2e)
Legend: Electricity, Heat
After measures, Before measures