Braunton Parish Council

Rural Community Energy Fund

Stage 1 assessment

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1.0 Executive summary

A large number of sites have been considered for community energy project development and a short list of projects have been determined as viable.

These can be split into those solar PV projects that have applied for pre-registration with ofgem and additional projects that could be developed in parallel or in the medium term.

The solar PV projects that have applied for pre-registration include:

- Lobb football club and campsite – up to 100 kW
- Braunton academy – 22 kW
- Southmead school – 10.5 kW
- SWW Velator – 50 kW
- British surf museum – 4 kW
- Vivian moon centre – 4 kW
- Countryside centre – 4 kW

These projects were pre-registered with Devon based Community Benefit Society, Exeter Community Energy (ECoE). It is hoped that these projects will be funded and installed during 2016. They would provide energy cost savings to the community buildings, provide an opportunity for local people to obtain a return on investment in community sites and develop a community fund for local projects.

Additional sites that were suggested as potential community energy projects but that did not apply for pre-registration (for a variety of reasons) include:

- Tesco – large roof suitable for large solar PV array and high daytime electrical demand. Development would depend on Tesco senior management changing view on community energy and a viable Feed in Tariff (FIT) tariff.
- Perrigo – very large roof space and high daytime electrical demand. Development would depend on management decision and viable FIT tariff.
- Tyspane Care Home – suitable roof space and high daytime electrical demand. Development would depend on management decision and viable FIT tariff.
- Kingsacre Primary School – roof space suitable for 30 kW of solar PV and daytime demand. Development would require buy in from head teacher and viable FIT tariff.

The hydro sites that were investigated are not financially viable as community energy projects. They may be suitable for volunteer development.

Wood fuel district heating for the buildings surrounding the Caen car park is not financially viable. The buildings relatively low heating demand and the reduction in RHI mean financial returns are poor.

Wind generation remains a viable potential community energy project under the new 2016 FIT regime. A community turbine of suitable size would offer carbon and energy savings whilst generating significant revenue for a community organisation. Wind turbine development would need to be focused through Neighbourhood Planning and would need the full support of the local community.

In summary the projects that have applied for pre-registration offer a financially robust portfolio of community energy projects. A second round of development would depend on community engagement, technology type and a viable FIT.

2.0 Background information

This study considers the potential for community renewable energy projects in the Parish of Braunton.

This Rural Community Energy Fund (RCEF) funded project sought to identify viable community energy projects that would provide local benefits.

To ensure viability the projects were assessed on several criteria including:

- Technical feasibility
- Financial feasibility
- Community benefit
- Planning feasibility
- Legal and management feasibility

The Parish of Braunton is shown in Figure 1 below.

Figure 1 Braunton Parish boundary

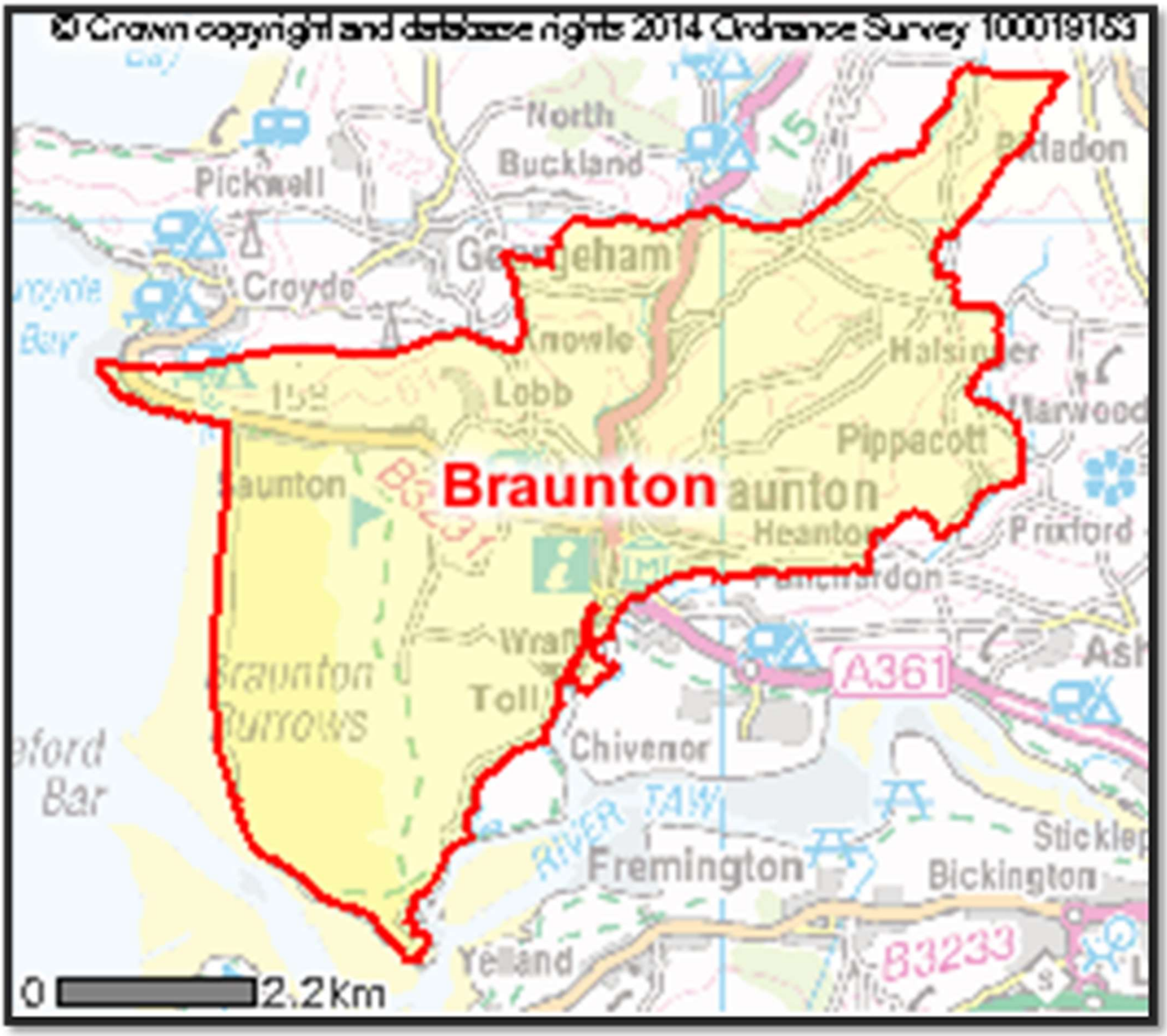

Figure 2 Key energy usage for the area (ONS)

Variable (as of 2001)	Braunton
Population	7510
Households	3326
Total Consumption of electricity and gas MWh	52,514
Consumption of ordinary domestic electricity MWh	11,791
Consumption of Economy 7 electricity MWh	3986
Consumption of domestic gas MWh	36738
Number of economy 7 meters	600
Number of domestic gas meters	2846

Figure 2 provides an overview of Parish population and energy use.

The energy consumption in Figure 2 take no account of local business use. There are some large energy users such as the local Tesco store and Perrigo manufacturing who use significant amounts of mains gas and electricity.

Heating systems in the village are a mix of mains gas, electric heating and some oil and LPG for rural properties. As the table in Figure 2 highlights the majority of households in the village are on mains gas. Many of the remaining households will be on electric storage heaters, due to the high number of Economy 7 meters.

The main concentration of energy use (heat and electric) is focused on the village of Braunton itself. The rural area surrounding the village has no major users of energy apart from Perrigo, the military base at Chivenor and holiday parks with electrical hook ups.

The high connection rate for mains gas systems means that the financial viability of renewable energy heating systems at this time is hard to stack up compared to the cheap prices available for mains gas supply.

There is however high electricity use in the Parish and this can be effectively offset by micro generation technologies such as solar PV, wind, hydro and gas CHP. This electrical usage remains high during the summer, due to large numbers of visitors to the area.

Therefore there is an opportunity to consider electrical generation technologies such as wind, solar PV and hydro and determine whether they can be used to reduce local energy demand, whilst providing benefit to the local community.

Legislation, existing information and studies

There is little specific research into the renewable energy potential of Braunton. The most relevant study is the North Devon Biosphere & Torridge District Energy Plan[1].

The report gives the following breakdown of renewable technology installed in the area.

Figure 3 North Devon Biosphere & Torridge Energy Plan Technology Split

Renewable energy technology	Total installed capacity (MW)	Number of installations	Average capacity per installation (MW)
Anaerobic digestion	6.1000	2	3.0500
Biomass	8.0174	134	0.0598
Heat pump	3.0236	283	0.0107
Hydro	1.7648	6	0.2941
Onshore Wind	74.0596	89	0.8321
Solar PV	47.1904	3433	0.0137
Solar Thermal	0.9801	253	0.0039

In the Biosphere report the area of North Devon is considered, but the Parish of Braunton is not assessed directly. Some key points can be taken from the report.

- The majority of renewable generation in the plan area is from electrical generation, with only 8% being thermal.
- Hydropower resource is constrained by the sensitive nature of many identified sites, requirement for consistent river flows and the nature of the terrain. The report did not identify any potential projects in the Braunton area. There are only 6 known hydropower installations in the plan area – due to the terrain and low seasonal flows.
- Biomass has seen an exponential growth in the Energy Plan area. It remains one of the most viable small scale technologies in the area. The report did not identify any projects in the Braunton area.
- Onshore wind contributes a large proportion of North Devon's renewable energy, due to the Fullabrook Down wind farm. Onshore wind generation has the highest installed capacity of ay technology in the plan area.
- Solar PV has the second highest installed capacity due to the large number of installations.
- Tidal energy. There is some tidal potential near to Braunton and the energy plan does consider the technology. However the main potential for the technology has been considered on Crown Estate land at Combe Martin. For this RCEF Stage 1 project tidal technology is not considered a commercially viable option at this time.

Thus overall the Biosphere energy plan identifies onshore wind and solar PV as the largest contributors to renewable generation in the area. No specific projects are identified in or around Braunton.

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[1] http://www.northdevonbiosphere.org.uk/uploads/1/5/4/4/15448192/energy_plan.pdf

Scope of the assessment

The assessment considered all Parish Council owned land and buildings. These are listed below:

a. Recreation Ground, Changing Rooms and Illingworth Shelter on Exeter Road.
b. Memorial Gardens and Memorial Shelter on Chaloners Road.
c. The Anchor area at Caen Street.
d. Old Railway Line from Anchor area Cean Street to Georgeham Cross.
e. Council Offices and Chamber, Chaloners Road.
f. Parish Hall and alcoves either side of the front entrance of the Hall, Chaloners Road.
g. Caen Street Car Park - Recycling Pavilion/notice board/height restriction barrier/signage.
h. Gardeners Shed on Chaloners Road, Memorial Gardens.
i. Maintenance Shed at Parish Hall, Chaloners Road.
j. The Bakehouse Centre (exterior), Caen car park.
k. Chaloners Road Car Park - boundary fence/height restriction barrier/signage.
l. Boundary fences/gates at Limetree and South View allotments.
m. Chaloners Road, Mowstead and Knowle Play Parks.
n. Beacon.
o. Velator Quay, Velator.
p. Old Quarry, Boode Road
q. Village Green, Caen Street
r. Bus shelters (7 in total)
s. Lobb Football Field

In addition to council owned land and buildings the study also considered community and business buildings/sites in and around the village that may be suitable for renewable energy.

For community energy schemes to be viable then the building or site being connected to must have reasonable electrical or heating demand. For instance solar PV will be no use to a building with little daytime electrical demand. It is this linking of supply to demand that is important for renewable energy projects to ensure technical and financial viability.

High heat users were sought in and around the village – but there are very few high users of heat that are not mains gas connected. Suitable sites for biomass heating include the large holiday parks. Several of these are off mains gas and have swimming pools which provide a high base load of heat which is a good match for wood fuel heating.

Renewable energy considered

The technology types considered as part of this Stage 1 assessment included:

- Wind generation
- Hydro generation
- Solar photovoltaic generation (solar PV)
- Wood fuel heating
- Heat pumps
- Gas combined heat & power (CHP)

As part of this RCEF Stage 1 study, basic energy efficiency feasibility was also undertaken for the buildings surrounding the Caen Street car park.

A wood fuel resource assessment was undertaken for the woodland owned by the Parish Council.

Methodology

For each of the main technology types a long list of potential projects was drawn up from a combination of desk top assessment, community engagement and discussions with the core project group.

Site visits were then undertaken to assess feasibility using the consultants experience and expertise. Sites were ruled in or out based on suitability for community energy project development.

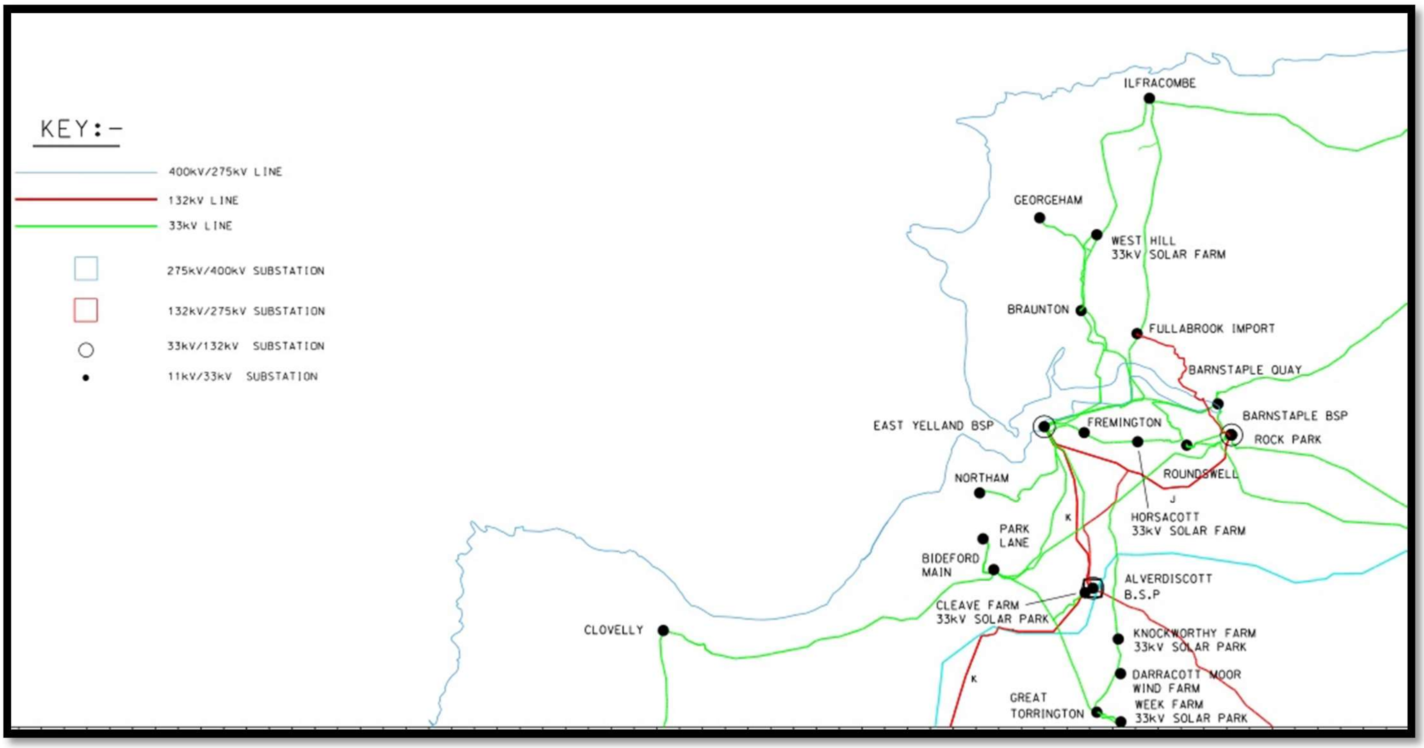
Short lists were then compiled and further technical and financial feasibility undertaken.

For sites deemed suitable for community energy development recommendations have been made as regards suitable community financial, legal and governance structures.

Limitations and Risks

- **Renewable energy support** – the Government has recently commissioned a review of the Feed in Tariff and Renewable Heat Incentive levels. The level of subsidy for renewable energy, and solar PV specifically, was set to be reduced significantly in 2016. This reduction has now been delayed and there has been talk of specific community subsidy support. The pictures at present is unclear. Key benefits for community schemes such as the ability to pre-register projects with ofgem and tax relief for community investment schemes have been removed. Several solar PV projects from the Braunton were recommended by the consultants to apply for pre-registration before the facility was removed. *Update – the new FIT tariffs for 2016 have been included in the financial section of the report and recommendations modified accordingly.*
- **Grid connection** – new grid connections are currently limited in the south west. This is due to a number of factors. However the regulations for connecting projects to the grid have not changed, Western Power Distribution are merely being more exacting in their application. Figure 4 below shows that Braunton is on the 33 kV network.

Figure 4 Western Power Distribution Grid Map



Private wire connections are the favoured option for renewable generation projects. The size of any system will depend on the current grid connection, site energy demand and the view of Western Power Distribution. WPD have been contacted for all of the viable community energy projects suggested in this report.

- **Planning** – certain renewable energy projects will require planning consent from the local planning authority – North Devon District Council. Wind projects will require consent. Most hydro projects require planning permission and additional consents such as an abstraction licence. PV projects can be permitted development, but in a lot of cases will require at least an informal enquiry to the local planning department. The involvement of the local planning authority early in any project development is vital.
- **Raising finance** – any community energy project will require capital expense (CAPEX) and operational expense (OPEX). The initial capital finance can be raised via loan, grant or investment finance. These will be discussed below. Operational finance can be covered by the revenue a project generates – this could be subsidy, energy sales or a power purchase agreement (PPA).
- **Governance** – if any of the viable projects are developed as community owned then a community organisation will need to be set up to manage it. This could be in a number of different formats, but the most common for a community renewable energy project is a Community Benefit Society (formerly an Industrial Provident Society). The governance model chosen needs to reflect the aims and objectives of the community group, and also to minimise risk.
- **Maintenance and administration** – renewable energy installations require management and maintenance. A proportion of the revenue from the schemes will need to be used to administer the projects and to cover the costs of any maintenance. Any financial calculations in this document will take into consideration these additional costs.

3.0 Community engagement

The project sought to engage with the local community from the very outset.

A public meeting was held during the application for Stage 1 RCEF funding to ensure the local community were fully supportive. Several public Parish Council meetings were also held during the application process to ensure full council and community support.

Once the funding was obtained and project was underway another full public meeting was held. This was advertised via local media, social media and posters/leaflets. The meeting was held at the Parish Hall and briefed those attending on the projects aims and objectives. The consultants also sought the input of the local community in regard to potential projects and stakeholder contacts.

The community was kept abreast of project developments through regular meetings with the Parish Council and the clerk, social media and local newsletter. This regular contact with the core project group ensured that any developments that required attention were identified and acted upon promptly.

Figure 5 Braunton community meeting

The project aimed to hold another large meeting during August 2015. However with the government review of the FIT and community renewable energy sector the focus of the Council and project group became the application to pre-register any viable solar PV projects that had a current EPC, or that funding for an EPC could be obtained for.

A significant amount of time during August right through to the end of September was spent on ascertaining the best response to the change in government policy, advising the Parish Council core group and reacting as quickly as possible. The RCEF consultants were actively involved in the pre-registration process. The decision was made to attempt to apply for pre-registration on low risk, viable solar PV projects that had strong community buy in and benefit.

Work included:

- Contacting and meeting with all stakeholders to update them fully and obtain buy in. The sites included Lobb football field and campsite, Vivian Moon Centre, Southmead Primary School, Surfing Museum, Countryside Centre, SWW Velator site and Braunton Academy.
- Contacting local planning authority to discuss projects.
- Identification of funding to cover costs of EPC assessments.
- Application to Devon Accelerator fund to cover costs of EPC assessments.
- Arranging EPC assessments.
- Identification of suitable community benefit society (CBS) 'Exeter Community Energy - ECoE' to apply for pre-registration.
- Application to ofgem for pre-registration of projects listed.
- Managing Devon wide community meetings to develop projects after pre-registration

This work took up a significant portion of time and resources on a part of the project that had been set aside for further engagement with the community to obtain their views on projects to develop.

A meeting with the wider community was delayed until pre-registration applications had been made. This meeting will take place in December 2015.

A meeting with the CBS was arranged for the 5th of November at which 3 Braunton community representatives were due to attend.

It is hoped that the projects identified and applied for pre-registration will form part of a portfolio taken forward by Exeter Community Energy. The community of Braunton will be able to invest directly in the portfolio with direct benefits coming back to the community of Braunton.

Stakeholder engagement

Additional to engagement with the wider community, outside of the core project group, the feasibility study also engaged directly with stakeholders in the parish. This comprised of contacting potential sites for community projects and also any other organisation or individual that may have an interest or stake in the development of a project at the site.

This relationship with stakeholders was continued throughout the project, in particular with those interested in developing a community led and owned project.

This approach was undertaken for the majority of sites investigated during the project. For sites where it was not possible to obtain buy in a visual assessment was undertaken on the site.

Other stakeholders involved in the study included:

- North Devon District Council – consulted as planning authority for schemes that were not permitted development.
- Devon County Council – consulted for funding and guidance on sustainable transport alternatives (relating to charging of electric vehicles).
- South west water – consulted on sites in and around Braunton.
- Environment agency – contacted in regard to hydro assessment work.
- Western power distribution.
- Ofgem – consulted in regard to pre-registration
- Diocese of Exeter – consulted in regard to diocese owned land.
- Exeter Community Energy
- 361 energy
- All site owners and managers

This stakeholder engagement is still underway as the projects being developed as part of the pre-registration portfolio and those in a potential second round of development.

4.0 Technical assessment

Below are summarised the projects that have the potential to be taken forward as community energy projects. This is a summary of the technical assessment documents included as appendices.

Wind generation

There is significant potential for wind generation in the parish of Braunton. The higher ground to the E, NE and NW has excellent average wind speeds and is very exposed to prevailing winds. These areas do not have any high energy users and so a new grid connection would be required. This could raise issues with Western Power Distribution (WPD). These more rural areas are away from local housing and could be sited so as to cause minimal visual impact.

There are sites of high energy usage nearer to the village that have reasonable wind conditions as well. Both the Tesco and the Perrigo sites would support installation of a smaller wind turbine to offset on-site electrical demand. Private wire connections into these sites would provide excellent energy sale potential and offset local energy demand. These areas are already commercial/industrial in nature and therefore a wind turbine would not impact so much on the local landscape. Proximity to residential areas, the military base and local opinion would be the main considerations in these areas.

A mid-sized wind turbine – in the region of 50-500 kWp and on a 25-50m tower – would be technically and financially suitable for a community project in the areas identified. It would generate significant revenue, even under the new FIT regime, and may not be too large so as to impact severely on the local landscape. The table below shows a summary of the generation projections for a 50 and 500 kW turbine included in the appendices.

Figure 6 Braunton wind turbine generation summary

Project	Technology	Potential system size (kW)	Annual production kWh	Annual CO2 Saving kg
500 kW turbine @ 7m/s	wind	500	2,000,000	897,540
500 kW turbine @ 6m/s	wind	500	1,600,000	718,032
50 kW turbine @ 7m/s	wind	50	230,000	103,217
50 kW turbine @ 6m/s	wind	50	175,000	78,535

It can be seen that a wind turbine of this size in or around Braunton would provide robust energy generation and carbon offset compared to other renewable technologies such as solar PV – you get more energy produced per kW installed. A turbine would also provide a robust return on investment, as detailed in the financial section below.

The successful development of a community wind turbine in Braunton would require the *full* support of the community. Any objection would be grounds to deny planning permission. Recent government announcements in regard to onshore wind, interventions from the Secretary of State, and local planning guidance means that any turbine would go through an exacting process to achieve planning permission.

The local military airbase would also be a major factor in any development of a turbine.

The most suitable approach for wind development would be to utilise the Neighbourhood Plan process as a means to further engage the local community on their views towards community wind and where wind generation would be acceptable. This would identify any local opposition/support very early on.

In summary a wind turbine has the potential to offset significant local energy demand and carbon emissions. The larger the turbine, the more efficient it is and the more energy it would generate. Revenue from a turbine could be large, with real added benefits for the local community. The larger a turbine then the more difficult it would be to obtain planning permission.

Wood fuel heating

For a wood fuel heating system to be viable for community development the project site has to have a high heating demand, high current heating costs (off mains gas ideally) and the space required to accommodate larger wood fuel heating systems.

This assessment initially considered the area around the Caen street car park to establish if there was any scope for a wood fuel district heating scheme – this was identified in early community meetings. The parish council owns the car park and the organisations that lease the buildings are all community focused organisations.

The buildings around the car park included:

- Medical centre – the building has a mains gas heating system. Despite initial support, they were unable to give the project further time after they signed up to a three year energy contract. Energy use data was not forthcoming.
- Wensley newsagents – no heating demand from the shop
- Countryside centre – no heating system at present and closed during the winter. Would like to install heating system to improve comfort levels and facilitate year round opening.
- Surf museum – has electric storage heaters. Building houses the surf museum, office space for a surf organisation, a day nursery for children and will also house an evening youth club.
- Braunton museum – efficient mains gas boiler system linked to radiators.
- Police station – being sold – low heating demand

The most viable renewable energy system for this area would be a small district heating system connecting the surf museum and the countryside centre. Both of these buildings do not have mains gas at present. To connect the museum would require laying heat main underneath a road – this would be expensive and reduce financial viability.

A pellet or wood chip system could be installed as a containerised system near to the surf museum. A wood chip system could utilise local timber supplies whereas a pellet boiler would use national/international sourced material.

The capital costs of such a system would be high. The heat demand from the surf museum and countryside centre are however not large. The Renewable Heat Incentive has been significantly reduced recently. Due to these factors a wood fuel heating system would be difficult to finance as a community scheme at this time.

Figure 7 Caen wood heating system summary figures

Project	Fuel	Potential system size (kW)	Annual production kWh	Annual CO2 saving vs electric heating kg	Fuel Costs £	Total Income £	Total cost £	Simple payback years	Gross ROI %
Surf museum heating	chip	50	60,000	25,786	2,100	3,108	51,500	17	6
Surf museum heating	pellet	50	60,000	25,786	2,880	2,328	51,500	22	5

At present both the surf museum and countryside centre are locked in to expensive electric heating systems. Extending the gas main to connect to the buildings would enable gas boilers and wet systems to be installed. Perhaps the organisations could share the cost of connection.

Heat pump systems are not suitable for either the surf museum or the countryside centre. There is the technical feasibility for water source or air source heat pumps. However the costs of such systems, and the low temperature heating systems required for the properties, are not financially viable.

There are no other significant heat users in parish council owned buildings. The parish hall itself is mains gas connected and a wood fuel heating system would offer little in the way of financial savings at present.

The main heat users in the Parish are Perrigo and the various hotels. Most of these sites are mains gas connected. Saunton Sands hotel has already installed a wood chip heating system. The holiday parks with swimming pools provide an excellent base heat load that would suit wood fuel heating systems and some are off mains gas. Contact was made with all local holiday parks but the companies were not interested in taking part in a community project at this stage.

Smaller local heat users include hotels and bed and breakfasts in the village. These businesses are predominantly mains gas connected and too small to offer the kind of heat load that would make a community project viable.

Other community buildings such as the cricket club and bowls club do not have a high enough heating demand.

Local schools are on the whole mains gas connected. Southmead and Kingsacre have the space for biomass systems but are mains gas connected. The Academy is mains gas connected. Caen school is limited for space and a wood fuel heating system would be difficult to install at the site.

There are no major heat users on the industrial estate at Velator. Providing heat for a commercial user can be problematic as well – if the business moves or ceases to trade then the heat load is gone and the system generates no revenue.

Woodland management

Although there are no large biomass systems in the village, many of the properties have wood burning stoves.

The Parish Council has parcels of woodland at the Beacon above the village and the Old Quarry. These woods are currently not managed. The Beacon and Old Quarry sites have a managed sustainable annual yield of 60 and 17 tonnes of timber respectively. This is not an insignificant amount of timber available for use in local wood burning systems.

A community scheme for managing the woodland and extracting the timber could be a ‘logs for labour’ arrangement. These types of project are a way of local people actively managing local woodland and gaining timber in return. There are many successful projects such as this being run throughout the country.

This active management of woodland has several benefits:

- It gives local people access to timber which can reduce heating costs and carbon emissions (especially lower income households),
- managed woodland has higher levels of biodiversity,
- local people getting out and being active in woodland is a way of keeping fit and engaged with other local people.

Training would be required for local people interested in starting a project. Funding may be sought for this. Generally only hand tools are used for insurance reasons. A community woodland management scheme would be an excellent way of local people working together to deliver community and environmental benefits. It would also help to manage woodland that is currently overgrown and of low value.

There are currently training days being provided by Devon Hedge Group. Although not aimed directly at logs for labour schemes many of the principles are relevant. The woodlands owned by the Parish Council are small enough that the principles from such an event would be useful.

Devon Hedge group is running a project funded by ‘Awards for All’ to help people start community groups to harvest wood fuel from local hedges, and also lay the hedges.

The benefits to community members include free logs for wood burners, the chance to practice traditional hedge-laying, exercise, and companionship, all while they help protect the heritage and biodiversity of their local landscape.

The benefits to farmers and other landowners include contribution to HLS targets, free logs, reduction in flailing costs, and a way of having their hedges laid traditionally.

They can offer:

- A presentation at a public meeting
- Help negotiating a licence with a local landowner
- Help setting up a group, including a proforma constitution, and information on health and safety requirements
- The insurance premium for the first year.

If Braunton Parish Council would like to host such an event, and publicize it, they would be happy to present at it. They can also contribute to publicity and refreshment costs. The event needs to be held before Christmas, though.

Other sources of funding for setting up a community wood fuel project could be LAG funding. One of the focuses of current LAG funding is woodland. One use of this funding, as well as setting up community woodland management, may be to put in place a community wood storage facility.

The timber would need to be seasoned and somewhere for the community to do this would help greatly. A community facility for storage of timber would help those with properties that lack the space to store timber supplies.

There are other parcels of un-managed woodland in the area. The Diocese owns a surprising amount of woodland in the area and would be open to community management of the resource. Private landowners also may be open to management of woodland as part of such as scheme.

Solar PV

The solar PV assessment for Braunton considered all sites with the space (roof and ground mount) and the potential for a private wire connection into a site with significant daytime electrical demand. This linking of supply to demand is the best way to ensure a low risk financially viable system that can be community owned and developed.

Sites with significant demand allow for robust energy sales from a community solar PV system. The demand needs to be present for the lifetime of the PV system (20 years) to maximise returns and minimise risk.

A full summary of the sites considered in the study is contained in the solar PV assessment appendix. Discussed here are the sites viable for community development.

Pre-registration applications to ofgem

As a result of the governments review of the solar PV FIT and policy relating to community renewable energy the decision was made to apply to ofgem for pre-registration of several solar PV projects that this study had identified. The sites applied for pre-registration through Exeter based 'Exeter Community Energy – (ECoE)' and some of the charitable organisations applied as themselves as well. This included:

Figure 8 Pre-registration project applications

Project	Installed capacity kWp	Pre-registration details
Southmead primary	10.5	ECoE
Braunton academy	22	ECoE
Lobb football field	48	ECoE, Braunton football club
Lobb campsite	48	ECoE
Vivian moon centre	3.6	ECoE, Vivian moon
Countryside centre	3.6	ECoE, Countryside centre
British surf museum	3.6	ECoE, British surf museum
SWW pumping station Velator	48	ECoE

These projects were taken forward for pre-registration because they had clear community benefit, were engaged as stakeholders and had current EPCs, or EPCs could be carried out in the very limited timeframe available for pre-registration as a result of government policy changes.

Each project in brief:

- **Vivian Moon community centre** – a local community centre used during the daytime and evening by the local community. A single storey south facing roof space in good condition with single phase grid connection. Capacity for inverter capacity of just under 4 kWp. A funded system could deliver electricity at cheaper than market rate to the centre, reducing their costs. Daytime demand is not high and this could affect the financial viability of the scheme. The scheme has been registered through ECoE and Vivian Moon charitable Trust – so alternative funding models are possible.
- **Countryside Centre** – community organisation aiming to educate locals and visitors about the local environment. On site daytime electrical consumption is high. The building has daytime electrical demand from room and display lighting. South facing single storey roof space. There is some shading on the roof from nearby trees to the west of the building. Capacity for inverter capacity of just under 4 kWp. A funded system could deliver electricity at cheaper than market rate to the centre, reducing their costs. The scheme has also been registered through ECoE and Countryside Centre charitable trust – so alternative funding models are possible.
- **British Surf Museum** – the building is used by the surfing museum, office space for a surf organisation and also as a children's nursery. Daytime electrical demand is therefore high. South facing single storey roof space. Some shading on the roof from nearby trees at present. Capacity for inverter capacity of just under 4 kWp. A funded system could deliver electricity at cheaper than market rate to the centre, reducing their costs. The scheme has also been registered through ECoE and Surf Museum charitable trust – so alternative funding models are possible.

- **Braunton academy** – this large college in Braunton has high daytime electrical demand during term time. The college have a written indication from WPD that the site will support 22 kW of solar PV additional to the 30+ kW they already have installed. The site has several roof mounting options. The site was registered through ECoE and is an attractive addition to an investment portfolio due to the ease of installation and size of system.
- **Southmead primary school** – primary school with high daytime electrical demand. Several roof mounting options for panels – a complicated installation due to the nature of the roof will result in higher installation costs than average. Robust energy sales but relatively small system for an investment portfolio.
- **South West Water pumping station Velator** – with high daytime electrical demand, especially during the summer months when visitor numbers swell, this site would offer high levels of on site electrical demand. The option for solar panel installation is a nearby agricultural barn. Installation costs would be higher than average due to long cable runs. The energy sale price to SWW would also not be high.
- **Lobb football field and campsite** – a roof or ground mount system with connection into the nearby Lobb campsite which has high summer time electrical demand. Additional connection to the football club pavilion. With ground mounting it should be possible to install 100 kW on the MPANs that have been submitted to ofgem. However if impact assessments are going to raise the project costs too much then there is the option of roof mounting a smaller system of 30 kW on the pavilion at the football club and smaller buildings on the campsite. This would have a smaller visual impact and would be permitted development. The football club has applied for pre-registration with ECoE and in its own name.

All of the sites that applied for pre-registration are technically feasible, have private wire connection to sites with daytime electrical demand and strong community benefits.

The ground mount system at Lobb field will require planning permission and it is likely that visual impact assessments and perhaps ecological assessments will be required – these could make the system financially less viable if the development costs are high.

Additional community solar PV opportunities

There are a number of sites within the Parish that are suitable for community solar PV that were not at a stage to take forward to a pre-registration application, but that might be developed in the medium term. These are listed below:

- **Kingsacre primary school** - meetings and a site visit were undertaken at the school and several efforts were made to pre-register the school. It has potential for 10-30 kW of roof mounted solar PV (WPD dependent). The head teacher seemed positive about a community solar project but progress was too slow to include the school as one of the pre-registration applications. The school has high daytime demand for electricity and the model for community solar PV on schools is a proven one. It would make a good community project in terms of technical, financial and community benefits.
- **Perrigo** – this very large roof space would support the installation of up to 1MW of solar PV. The building has very high daytime energy demand throughout the year. Viability of a community project would depend on enthusiasm from within the organisation and the level of FIT available. If a community FIT is introduced then the company may be more willing to undertake a scheme, if no commercial tariff is attractive. Meetings and site visits have been undertaken.

- **Tesco Braunton** – several meetings and site visits were carried out with the manager of the store who was very keen on a community project. However senior management at the time had a policy of developing any energy project in house. The store has a large roof space that would be suitable for at least 250 kW of solar panels, frame mounted. With the decrease in the FIT it may be worth revisiting this project as Tesco may not be so keen to develop a project in house. Project viability would depend on what FIT was available, if any.
- **Tyspane care home** – a suitable building technically for a medium sized roof mounted solar PV system. The building has high daytime energy use. It is a commercial premises and so there are higher risks compared to community buildings (if the business moves or ceases trading the system would be redundant and the investment would be lost).
- **Caen street car park** – the option of a car park solar system was explored in some detail with quotes being obtained from local installers. The current costs of such a system, covering car park spaces with frame mounted solar PV panels, was far too expensive. However the costs of these systems may fall in the medium term. A car park system could connect into the organisations surrounding the car park (if they do not install solar PV in the meantime) via private wire connections. It would be a sensible use of space. Perhaps a premium could be charged for shaded spaces that could provide additional revenue and there is the potential for electric vehicle charging spaces.

There were several other sites considered that were ruled out due to factors such as poor roof, shading, ownership or low daytime electrical demand.

Social housing in the area was considered, however renewable energy is developed in house at the social housing organisations in the area.

Devon County Council is offering free second-hand solar panels that are to community groups in North Devon due to a system being de-commissioned at the North Devon District Council offices. This opportunity will be discussed at the next Parish Council meeting on the 23rd of November 2015. Links to the opportunity here:

http://www.northdevonbiosphere.org.uk/news/free-solar-panels-for-community-organisations

Hydro

Both sites identified as being technically feasible, Iron Mills and the Velator Weir, are not viable financially. The systems would be expensive to install and the return on investment does not justify their development.

Energy efficiency

As part of the Stage 1 feasibility basic energy efficiency assessments were undertaken of the organisations surrounding the Caen street car park. These are included as appendices with this report.

The mini-reports identified clear savings for the buildings. Low cost solutions included secondary glazing, LED lighting and draught proofing of buildings.

5.0 Financial projection

Projects were considered on their potential financial merits as well as technical feasibility and community benefit. This section provides a summary of the financial assessments undertaken.

Basic business models incorporating current (2015) FIT levels, likely future FIT (2016) levels post subsidy review and a scenario without subsidy entirely, reliant on energy sales and PPA.

Solar PV, hydro and wind financial assessment

The potential electrical generation projects were assessed using forecasted revenue from the FIT, direct energy sales, export revenue and PPA (Power Purchase Agreement) revenue.

The basic return on investment and payback period of a scheme are highlighted, but this is only part of the picture when considering suitability for community energy projects. Smaller schemes generate less revenue in proportion to capital costs and revenue required for their maintenance and administration. Therefore very small schemes (less than 10 kWp) can be more difficult to justify as part of a wider portfolio. It may be possible to offset the risk of smaller projects by grouping them together with larger projects, which generate more revenue.

A basic financial summary for the following scenarios was undertaken for all potential projects (not including development or operational costs):

- With the current FIT eligible on installations before Oct 1st 2015 (this is the FIT that will be obtained by projects that achieve pre-registration with ofgem)
- Proposed FIT from Jan 15th 2016
- No FIT – revenue based on energy sales and PPA only

These financial summaries are included as appendices with this report.

The basic financial analysis for the 2015 FIT indicate that the systems with the best returns are those with simple roof mounted installations and good daytime electrical demand. This includes several of the projects included in the pre-registration with ECoE. Figure 9 below shows the basic financial summary for the *current FIT*. This will only apply to projects that have pre-registered or that will be able to achieve installation before Jan 2016.

A factor that cannot be known at this stage is any potential rental allowance that a land owner may charge for renewable installations on their land/building. For community buildings such as schools and community centres then the reduction in energy bills should be sufficient incentive for participation in the project. But when considering a community wind turbine on private land, a rental charge will likely have to be figured in.

Figure 9 Feed in tariff basic financial projection

Project	Technology	Potential system size (kW)	Annual production kWh	Annual CO2 Saving kg	Total Income £	Total cost £	Simple payback years	Gross ROI %
500 kW turbine @ 7m/s	wind	500	2,000,000	897,540	368,000	1,020,000	3	36
500 kW turbine @ 6m/s	wind	500	1,600,000	718,032	311,360	1,020,000	3	31
50 kW turbine @ 7m/s	wind	50	230,000	103,217	44,390	260,000	6	17
50 kW turbine @ 6m/s	wind	50	175,000	78,535	37,485	260,000	7	14
Perrigo 250	PV	250	257,500	115,558	41,664	236,750	6	18
Tyspane care home	PV	48	46,320	20,787	8,468	50,900	6	17
Lobb pavilion	PV	29	26,928	12,084	4,959	30,740	6	16
Kingsacre school	PV	11	9,933	4,458	1,851	11,525	6	16
Braunton academy	PV	22	21,164	9,498	3,944	25,910	7	15
Athletics track roof	PV	29	27,302	12,252	5,088	33,764	7	15
Agricultural Inn	PV	11	9,902	4,443	1,845	12,628	7	15
Tesco roof	PV	250	237,000	106,358	37,405	236,750	6	16
Perrigo 1 MW	PV	1,000	1,030,000	462,233	119,326	840,500	7	14
Southmead school	PV	11	10,101	4,533	1,882	13,730	7	14
Lobb campsite 50	PV	48	49,440	22,187	8,842	66,020	7	13
Athletics track ground	PV	29	28,253	12,679	5,265	39,812	8	13
Surf museum	PV	4	3,445	1,546	710	5,414	8	13
South west water Velator	PV	48	45,216	20,292	8,446	66,020	8	13
Countryside centre	PV	4	3,445	1,546	684	5,414	8	13
South west water green lane	PV	29	29,376	13,183	4,593	36,788	8	12
White lion	PV	4	3,467	1,556	714	5,414	8	13
Christ church	PV	11	9,902	4,443	1,548	12,628	8	12
Black horse	PV	2	1,896	851	390	3,230	8	12
Lobb campsite 100	PV	96	98,880	44,374	15,497	131,540	8	12
Vivian Moon	PV	4	3,470	1,557	637	5,414	9	12
Lobb campsite 150	PV	144	148,320	66,562	23,049	197,060	9	12
Lobb campsite 200	PV	192	197,760	88,749	29,639	262,580	9	11
Braunton Museum	PV	2	1,896	851	383	3,650	10	11
Brannock hall	PV	4	2,642	1,186	455	5,414	12	8
Fire Station	PV	4	2,660	1,194	428	5,414	13	8
Caen car park 30	PV	29	29,376	13,183	5,695	88,196	15	6
Caen toilets	PV	1	948	425	181	3,125	17	6
Caen car park 100	PV	97	99,144	44,493	15,670	296,474	19	5
Iron mills hydro	Hydro	6	21,500	9,649	5,133	83,000	16	6
Velator weir hydro	Hydro	5	18,000	8,078	4,298	70,500	16	6

This basic financial assessment clearly illustrates that wind generation can deliver the best income and returns on investment.

Solar PV projects with high daytime demand can also deliver good returns at current FIT levels, but the total income generation is lower. As daytime demand falls, so does the return for solar PV. In terms of income generation it is the larger solar PV installations with high demand such as Perrigo, Tesco, Braunton Academy, Lobb Campsite and Tyspane Care Home that give the larger totals. It is important to make the point that larger installations, that generate more revenue, are much lower risk than smaller installations.

The hydro systems perform worst of all, due to their high installation costs.

The returns drop significantly when the new FIT for renewable technologies is factored in. This can be seen in Figure 10 below.

Figure 10 Feed in tariff January 2016 basic financial projection

Project	Technology	Potential system size (kW)	Annual production kWh	Annual CO2 Saving kg	Total Income £	Total cost £	Simple payback years	Gross ROI %
500 kW turbine @ 7m/s	wind	500	2,000,000	897,540	206,200	1,020,000	5	20
500 kW turbine @ 6m/s	wind	500	1,600,000	718,032	181,920	1,020,000	6	18
50 kW turbine @ 7m/s	wind	50	230,000	103,217	30,797	260,000	8	12
50 kW turbine @ 6m/s	wind	50	175,000	78,535	27,143	260,000	10	10
Perrigo 250	PV	250	257,500	115,558	24,900	236,750	10	11
Tyspane care home	PV	48	46,320	20,787	5,170	50,900	10	10
Lobb pavilion	PV	29	26,928	12,084	3,042	30,740	10	10
Kingsacre school	PV	11	9,933	4,458	1,144	11,525	10	10
Braunton academy	PV	22	21,164	9,498	2,437	25,910	11	9
Athletics track roof	PV	29	27,302	12,252	3,144	33,764	11	9
Agricultural Inn	PV	11	9,902	4,443	1,140	12,628	11	9
Tesco roof	PV	250	237,000	106,358	21,976	236,750	11	9
Perrigo 1 MW	PV	1,000	1,030,000	462,233	81,525	840,500	10	10
Southmead school	PV	11	10,101	4,533	1,163	13,730	12	8
Lobb campsite 50	PV	48	49,440	22,187	5,322	66,020	12	8
Athletics track ground	PV	29	28,253	12,679	3,253	39,812	12	8
Surf museum	PV	4	3,445	1,546	416	5,414	13	8
South west water Velator	PV	48	45,216	20,292	5,227	66,020	13	8
Countryside centre	PV	4	3,445	1,546	390	5,414	14	7
South west water green lane	PV	29	29,376	13,183	2,501	36,788	15	7
White lion	PV	4	3,467	1,556	418	5,414	13	8
Christ church	PV	11	9,902	4,443	843	12,628	15	7
Black horse	PV	2	1,896	851	229	3,230	14	7
Lobb campsite 100	PV	96	98,880	44,374	8,645	131,540	15	7
Vivian Moon	PV	4	3,470	1,557	341	5,414	16	6
Lobb campsite 150	PV	144	148,320	66,562	12,770	197,060	15	6
Lobb campsite 200	PV	192	197,760	88,749	16,765	262,580	16	6
Braunton Museum	PV	2	1,896	851	222	3,650	16	6
Brannock hall	PV	4	2,642	1,186	230	5,414	24	4
Fire Station	PV	4	2,660	1,194	201	5,414	27	4
Caen car park 30	PV	29	29,376	13,183	3,603	88,196	24	4
Caen toilets	PV	1	948	425	100	3,125	31	3
Caen car park 100	PV	97	99,144	44,493	8,799	296,474	34	3
Iron mills hydro	Hydro	6	21,500	9,649	3,278	83,000	25	4
Velator weir hydro	Hydro	5	18,000	8,078	2,744	70,500	26	4

With the introduction of the new 2016 FIT regime it is still wind turbines that perform better, giving reasonable returns on investment that would support a community energy project.

Again it is the larger solar PV sites with high daytime demand that perform best, such as Perrigo, Tesco and Tyspane Care Home. Other smaller schemes become less financially viable. Those with returns below the 10% mark would struggle to offer a viable financial case for investment.

With the FIT removed completely and schemes wholly reliant on energy sales and income from Power Purchase Agreements the viability of community schemes becomes significantly compromised. In this scenario solar PV becomes completely unviable as a community proposition unless grant funding could be used to reduce Capex costs or the costs of installation fell. This is shown in Figure 11 below.

Figure 11 No FIT basic financial projection

Project	Technology	Potential system	Annual production kWh	Annual CO2 Saving kg	Total Income £	Total cost £	Simple payback years	Gross ROI %
500 kW turbine @ 7m/s	wind	500	2,000,000	897,540	150,000	2,020,000	13	7
500 kW turbine @ 6m/s	wind	500	1,600,000	718,032	120,000	2,510,000	21	5
50 kW turbine @ 7m/s	wind	50	230,000	103,217	17,250	220,000	13	8
50 kW turbine @ 6m/s	wind	50	175,000	78,535	13,125	260,000	20	5
Perrigo 250	PV	250	257,500	115,558	19,313	210,500	11	9
Tyspane care home	PV	48	46,320	20,787	3,474	45,860	13	8
Lobb pavilion	PV	29	26,928	12,084	2,020	30,740	15	7
Kingsacre school	PV	11	9,933	4,458	745	11,525	15	6
Braunton academy	PV	22	21,164	9,498	1,587	23,600	15	7
Athletics track roof	PV	29	27,302	12,252	2,048	30,740	15	7
Agricultural Inn	PV	11	9,902	4,443	743	12,628	17	6
Tesco roof	PV	250	237,000	106,358	17,775	236,750	13	8
Perrigo 1 MW	PV	1,000	1,030,000	462,233	77,250	1,260,500	16	6
Southmead school	PV	11	10,101	4,533	758	12,628	17	6
Lobb campsite 50	PV	48	49,440	22,187	3,708	55,940	15	7
Athletics track ground	PV	29	28,253	12,679	2,119	39,812	19	5
Surf museum	PV	4	3,445	1,546	258	5,414	21	5
South west water Velator	PV	48	45,216	20,292	3,391	66,020	19	5
Countryside centre	PV	4	3,445	1,546	258	5,414	21	5
South west water green lane	PV	29	29,376	13,183	2,203	36,788	17	6
White lion	PV	4	3,467	1,556	260	5,414	21	5
Christ church	PV	11	9,902	4,443	743	14,833	20	5
Black horse	PV	2	1,896	851	142	3,230	23	4
Lobb campsite 100	PV	96	98,880	44,374	7,416	131,540	18	6
Vivian Moon	PV	4	3,470	1,557	260	5,414	21	5
Lobb campsite 150	PV	144	148,320	66,562	11,124	197,060	18	6
Lobb campsite 200	PV	192	197,760	88,749	14,832	262,580	18	6
Braunton Museum	PV	2	1,896	851	142	3,650	26	4
Brannock hall	PV	4	2,642	1,186	198	5,414	27	4
Fire Station	PV	4	2,660	1,194	200	5,414	27	4
Caen car park 30	PV	29	29,376	13,183	2,203	88,196	40	2
Caen toilets	PV	1	948	425	71	3,125	44	2
Caen car park 100	PV	97	99,144	44,493	7,436	296,474	40	3
Iron mills hydro	Hydro	6	21,500	9,649	1,613	83,000	51	2
Velator weir hydro	Hydro	5	18,000	8,078	1,350	70,500	52	2

Schemes are most viable under the current FIT regime (2015 FIT - that was used for the projects that have applied for pre-registration). Projects that sought pre-registration with ofgem should provide a robust return on investment should they be successfully funded.

Under the new FIT regime community wind generation continues to be financially viable as is larger solar PV with high daytime electrical demand.

If the FIT is removed entirely then schemes become reliant on a reduction in installation prices or grant funding to reduce capital costs.

It is possible, though perhaps not likely, that the government will introduce a community FIT rate. This may make schemes financially viable.

Several schemes have applied for pre-registration and the Braunton community can develop these solar PV community projects while keeping others in mind to be developed in the medium term, when there may be greater certainty in government policy for community energy schemes.

Projects that should be focused on by the community, additional to the solar PV projects that have applied for pre-registration and dependent on a favourable community Feed in Tariff, are:

- Perrigo solar PV
- Kingsacre school solar PV
- Tesco solar PV
- Tyspane care home
- Wind generation in general – scope for community turbine in commercial setting or high average wind speed zone – should form part of Neighbourhood Plan process

6.0 Community Benefit

Projects have been identified that can deliver real benefits to the local community. The identified energy projects have the ability to do this in several ways:

- Reducing the energy costs of local buildings and helping to ensure their financial viability.
- Allowing local people to invest in, and obtain a return from, local projects.
- Developing local supply chains and low carbon business – from installations and maintenance – the project is not predicted to create any new jobs.
- Facility to set up a community fund.
- Raising awareness of energy and climate change issues – helping to stimulate action to reduce energy use and carbon emissions.
- School installations will help inform curriculum activity.
- Momentum to go on and develop further community projects, building community resilience.

The community benefit for the potential Braunton projects can be split into two project categories; the benefits from the projects that have applied for pre-registration with ofgem and the potential benefits of other 'non pre-registration' eligible projects that may be developed.

Pre-registration solar PV projects

This portfolio of projects applied to ofgem for pre-registration through the CBS Exeter Community Energy (ECoE). Several of the smaller projects were also registered as individual charitable trusts.

It is hoped that a share offer will take place in 2016 that includes the portfolio of projects in Braunton. The share offer portfolio will include projects from throughout Devon. A share offer working group will be set up that includes a representative of each of the groups. The first of these meetings took place on the 5th of November. It is important that there is representation from Braunton at these meetings to ensure the best interests of the local community are served.

This share offer working group will develop a business plan that supports the share offer. The business plan will be made up of the individual business cases from each group. ECoE and its directors will be legally responsible for the contents of the share prospectus and liable for any debts or legal liability incurred as owner of the installations, therefore ECoE will be involved in each business case from each community group and the overall business plan.

It is hoped that each community will have a proportion (based on their contribution to the overall portfolio) of a community fund.

The projects that applied for pre-registration with ECoE will, if funded, provide clear benefits to the local community.

The majority of the projects are linked to buildings that are important hubs in the community;

Vivian Moon Centre – used by local elderly people & community groups as a place to meet and socialise

Countryside centre – important local attraction and charitable educational facility. Also used as community meeting venue

British surf museum – important local attraction, office space for surfing organisation, daytime children's nursery and youth centre.

Southmead school – important community building

Lobb Football club – community sporting facility

All of the sites play an important role in the community. Providing the opportunity for local people to invest in a scheme that helps ensure their continued financial viability can only be a positive thing.

The pre-registration projects that involve local businesses are:

Lobb football club/campsite – established local business. Contributes to local tourism based economy.

South west water pumping station at Velator – local utility.

By providing cheaper, more sustainable energy to these two local sites the community energy project will be reducing carbon emissions. The two sites are two larger projects in the Braunton portfolio, and important in terms of income generation. This would help to provide a sound return on investment and help to set up a community fund pot.

Other sites that have not applied for pre-registration

Of the projects that did not apply for pre-registration the one with the most community benefit would be Kingsacre primary school. This would reduce the schools operating costs, increasing its financial viability.

The other remaining solar PV and wind projects would be included for their potential to provide a return on investment for a community portfolio:

- Wind turbine connected to local high energy user such as Perrigo or Tesco – would provide a robust ROI reducing investment risk and generating a larger community fund. The same is true of the schemes below. A wind turbine located in higher wind zones would not have the same private wire potential, but would still generate excellent ROI, helping to provide large amounts of revenue for a community fund.
- Perrigo solar PV
- Tesco solar PV
- Tyspane solar PV

7.0 Planning and Permitting

Wind generation

The most contentious renewable energy technology in terms of its visual impact, wind turbines have the potential to generate large amounts of energy and revenue. A community wind turbine project would need the full support of the community and local stakeholders.

The larger the turbine the more contentious it would be, but the greater the potential benefits to the local community in terms of revenue and contribution to a community fund. It should be possible to site and scale a turbine so that it minimises visual impact yet generates significant benefits to the local community.

If the Parish Council, or a community group, wanted to develop community owned wind capacity then suitable areas would need to be identified as part of a Neighbourhood Plan process. This would be the first step in looking at wind in and around the village as a viable community project.

The latest guidance for wind turbine projects is:

The Written Ministerial Statement made on 18 June 2015 is quite clear that when considering applications for wind energy development, local planning authorities should (subject to the transitional arrangement) only grant planning permission if:

- *the development site is in an area identified as suitable for wind energy development in a Local or Neighbourhood Plan; and*
- *following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and therefore the proposal has their backing.*

Whether the proposal has the backing of the affected local community is a planning judgement for the local planning authority.

There are other planning criteria that would need to be met for a wind turbine to obtain successful planning permission. These include noise, visual impact, health and safety, ecology, cumulative landscape impact and local support. This is not to say that a wind turbine is doomed to failure. However it would be a serious undertaken and would need full community consultation and support.

The various considerations for wind generation planning are listed here:

http://planningguidance.communities.gov.uk/blog/guidance/renewable-and-low-carbon-energy/particular-planning-considerations-for-hydropower-active-solar-technology-solar-farms-and-wind-turbines/#paragraph_015

Because of the proximity to Chivenor airbase there are safeguarding criteria that need to be taken into consideration as well.

The relevant sections of the adopted Local Plan are

4.22 Within the air safeguarding zones for the Royal Marines Barracks and the Search and Rescue Unit at Chivenor, the Eaglescott Airfield and the National Air Traffic Service at Burrington Moor as shown on the Proposals Map, development will not be permitted where it harms aircraft safety. In addition, the airsafeguarding zone for windfarm developments covers the whole of the District so it is not shown on the Proposals Map. Any windfarm developments will need to avoid harming aircraft safety in accordance with Policy DVS5.

Any wind proposal would be required to consult with the Ministry of Defence and NATS.

Any one element of the community that raised opposition to a scheme would constitute valid reason for refusal of a planning application, even if all material considerations had been met. The Local Planning Authority draws attention to a recent Secretary of State judgement which they feel has altered the playing field for onshore wind. This judgement refers to the written Ministerial Statement of the Secretary of State on local planning of the 18th of June 2015.

Of interest is also the NDC/TDC current consultation on identifying areas for wind energy http://consult.torridge.gov.uk/portal/planning/localplan/wind_energy_options

A wind turbine in or around Braunton is likely to be subject to a full visual impact assessment as well as other studies, such as ecological assessments.

Solar PV

Planning considerations for solar PV systems depend on site location and how the panels are installed. Roof mounted solar PV is generally deemed of low visual impact and is relatively easy to obtain planning permission for. For permitted development rights a solar PV installation needs to meet the following criteria.

All solar installations are subject to the following;

- Panels on a building should be sited, as far as possible, to minimise the effect on the appearance of the building.
- They should be sited, as far as possible, to minimise the effect on the amenity of the area.
- When no longer needed, they should be removed as soon as possible.

Roof and wall mounted solar panels;

- Panels should not be installed above the ridgeline and should project no more than 200mm from the roof or wall surface.
- If solar panels are to be installed on or within the curtilage of a dwelling house which is listed, planning permission will be required.

Stand-alone solar panel installations in the grounds of a non-domestic building;

All the following conditions must be observed:

- Equipment should be sited, so far as is practicable, to minimise the effect on the amenity of the area.
- When no longer needed the equipment should be removed as soon as reasonably practicable.

All the following limits must be met:
Only the first stand-alone solar installation will be permitted development. Further installations will require planning permission from the local authority.

- No part of the installation should be higher than 4m.
- The installation should be at least 5m from the boundary of the property.
- The size of the array should be no more than 9 square metres or 3m wide by 3m deep.
- Panels should not be installed within the boundary of a listed building or a scheduled monument.

- If the property is in an Article 2(3) designated area* no part of the solar installation should be nearer to any highway bounding the grounds of the property than the part of the building that is nearest to that highway.

** Designated land includes national parks and the Broads, Areas of Outstanding Natural Beauty, conservation areas and World Heritage Sites.*

The majority of the building mounted systems outlined in this report are permitted development. It is a good idea to submit a pre-application enquiry for each project to be sure that permitted development rights apply, unless the installer is confident it is permitted development.

The ground mount installations covered in this report would all require a planning application.

Biomass heating

Certain elements of a wood fuel heating installation would also require planning permission. Any new buildings related to the installation would require planning permission. If a new building is needed for plant or fuel storage it will be subject to the same planning guidelines as for other extensions or outbuildings.

A flue added to an existing building should be permitted development as long as it does not stand over 1 metre clear of the building height.

A wood fuel heating scheme also requires the developer to contact Environmental Health to ensure the system complies with air quality guidelines. This should be undertaken at the outset of any project.

Hydro

Any additional building elements to a hydro system will require planning permission as well as other consents. Therefore any intake, tailrace and generator housing will require a planning application.

8.0 Operation & governance

Proposed Legal Structure for Projects

The legal structure for the organisation that has applied for pre-registration with ofgem is a Community Benefit Society (CBS). A CBS is often chosen as the vehicle for setting up a community energy organisation for a number of reasons. There is a good comparison of the benefits of a CBS and a co-operative society (CS) model for community energy projects here:

https://www.gov.uk/government/publications/community-energy-strategy-update/decc-overview-on-co-operative-societies-and-community-benefit-societies

In short the main benefits of a CBS are:

- A CBS exists for community benefit, rather than for the benefit of its members.
- There are currently regulatory, legal and technical challenges that means a CS will sell energy to the grid, rather than to its members. Currently the CBS model may be a more appropriate model for community energy generation groups who are aiming to achieve sustainable revenue and provide long-term benefits to the community.
- CBSs can utilise a statutory asset lock, which prevents assets from being used other than for the benefit of the community.

Exeter Community Energy, which has been used as a vehicle to apply for pre-registration for the initial solar PV projects in Braunton, was set up as an Industrial & Provident Society, the precursor to a CBS.

It would make sense to develop as many of the initial solar schemes as possible through ECoE (if pre-registration is granted by ofgem). This process would ensure the projects are funded in good time, place no administrative burden on the Parish Council or volunteers, and are low risk. It is exactly the right legal and administrative structure that the projects should use.

Projects that could follow an alternative route include the Football Club, Vivian Moon, Countryside Centre and Surf Museum. If another community organisation was set up, perhaps local to Braunton, it would need to pull together the governance, legal and financial package for delivering the projects within 9 months. There is also the risk that the organisation is unlikely to have done it before. These projects are also smaller, and therefore higher risk, and may be better included as part of a portfolio of larger projects that can help spread risk.

If the community is agreed, it would be best to fund the smaller pre-registration solar PV projects through ECoE with the other projects to reduce risk and allow for a larger community fund. It also gives a better chance of the projects being funded in the short timeframe available (9 months before pre-registration runs out).

Raising finance and distribution of income

Should all of the projects proceed with development through ECoE then finance will be raised through the CBS. In the first instance this may utilise loan funding to ensure timely installation of the projects. This loan finance will be repaid by issuing shares in the projects, including to the communities in which the projects are based.

ECoE will cover the CAPEX and OPEX costs of the installations. Representatives from Braunton would work with ECoE to help develop the projects and ensure direct benefits for the local community of Braunton (including a community fund).

Once this capital has been raised and the systems installed the revenue from the FIT and energy sales goes back into ECoE to provide a return to investors and cover OPEX. The financial benefit to the community of Braunton will be the reduced energy costs of the sites, a return to local investors and a community fund to be used on Braunton projects.

If the smaller charitable trusts look to independently fund their projects, or do so through an alternative community organisation/model, financing options are listed below:

Crowd funding – where projects and businesses are financed through small contributions from a large number of sources rather than through just a few or one – has grown significantly in recent years. These platforms provide a way of people investing or giving money to allow projects to be developed. They differ in the actual model that they use, some offer a return on investment (technically a CBS or CS is crowd funding) while others are simply a way of people donating money to projects. Smaller projects could be funded by asking local people to donate to projects that will benefit the community. This relies heavily on local good will and interest in community benefit.

Revolving fund – if a model of funding is used that does not require the FIT to be used to provide a return on investment to people financing the project then it may be feasible to set up a revolving fund to finance future projects. In this scenario the FIT is used to finance further projects that generate further revenue through renewable subsidies and energy sales, growing the income streams for the fund. An example of this locally is the Carbon Neutral Exmoor Fund.

Joint ventures – where a local community partners with a business, developer or local authority to help finance a project. They can help project finance, but actual community benefit may be lower than projects developed and owned by the local community.

Wholesale lending offers – at the moment finance of community energy projects from more traditional financial institutions is hampered by government policy and inconsistent financial regulation of the sector. In countries with a more established community energy sector there is a greater supply of lending. For instance in Germany many communities are striving towards 100% energy independence. Around half the capital borrowed by community groups comes from co-operative banks and a third from development loans Kfw promotional bank. Loans are offered at a long term rate of 1%. Bankers have a much greater understanding of the risks and benefits of community schemes and there is a higher level of trust. At present this ease of lending for community projects does not exist in the UK.

Grant funding – before the introduction of renewable energy subsidies such as the FIT and RHI renewable energy projects used grant funding to offset the high capital costs of the systems. These grants were available from a number of organisations such as the government, EU funding and private businesses. There is little in the way of grant funding available now due to the renewable subsidies. However if the FIT and RHI are scrapped completely then some level of grant funding may well be re-introduced.

Succession planning

While the first round of solar PV projects are being developed thought should be given to the next round of projects that may be taken forward.

Certainly the high energy users such as Perrigo and Tesco may take a more keen interest if a community FIT is introduced. Kingsacre school should also be part of any further community project development.

Wind generation should also be seriously considered as part of the Neighbourhood Plan process.

9.0 Scheduling

The pre-registration process should become clearer in the New Year (2016). A response will be made by ofgem in regard to the applications. If they are successful then progress with ECoE will need to be made quickly, with key representation from the Braunton community. The systems will need to be installed as soon as possible, to meet the pre-registration deadline of the end of Sept 2016.

A Neighbourhood Planning process should include renewable energy, and specifically wind generation. The Parish Council needs to decide on if/when this will be undertaken.

Other project development, such as Perrigo and Kingsacre, should be run in parallel with the pre-registration projects. If a community FIT is introduced in the New Year, or the current FIT remains more favourable, then there is no reason they cannot be developed along the same timescales. *Update – the new FIT still provides some financial viability for these larger schemes, and they should be developed further.*

10.0 Other considerations

Robustness of energy and carbon savings

During community meetings questions were asked about the energy and carbon paybacks of various renewable energy technologies. A brief summary of each technology is given below. Please note that these are average figures – they are not specific to Braunton.

Figure 12 Renewable energy carbon paybacks

Technology	Average energy payback - years	Average CO_2 emissions – g per kWh
Solar PV	2.5[2]	60[3]
Wind Turbine	0.25-0.5[4]	4.64[4]
Hydro Turbine	n/a	<5[4]
Mains Electricity	n/a	500-1000
Biomass	n/a	25

Superscript relates to footnotes below

Storage technology

All of the proposed community energy projects have robust daytime electrical demand, and demand during the months with longer daylight hours. This fits well with the generation from solar PV.

Some of the buildings, for instance the surf museum, have electrical demand during the evening when solar PV will not be generating. Storage technology would allow for excess energy that is produced during the day from solar panels to be stored and used when it is needed.

The only viable technology present at the moment for small scale applications such as this would be some form of battery storage. Technically it is a solution that could be used. But it is not recommended as a solution for community energy projects at this time for a number of reasons.

- There is very little in the way of independent, verifiable information on the reliability, safety, efficiency and financial viability of small scale battery storage systems. The Centre for

[2] http://pubs.acs.org/doi/pdfplus/10.1021/es071763q
[3] http://www.parliament.uk/documents/post/postpn268.pdf
[4] https://www.cse.org.uk/downloads/reports-and-publications/renewables/common_concerns_about_wind_power.pdf

Alternative Technology strongly advises against battery storage[5], unless it is unavoidable (for off grid systems for instance).

- Small scale battery storage systems add a component that needs to be monitored and managed in a system, solar PV, that at present is almost fit and forget.
- Batteries take up space – many of the sites are space limited.
- Batteries are a health and safety consideration. Batteries can potentially be dangerous and add a fire hazard to sites that will have children and members of the community using them.
- The cost of installing battery storage into any system would outweigh any savings achieved. At a cost of more than 15 pence a unit[6] for any stored energy there are little, if any, cost savings to currently be achieved. This does not take into consideration extra costs for wiring, controls and installation which are likely to add further costs to the energy produced. If a battery system could be installed cheaply, and offer some savings, the payback on a system is still likely to be very long.
- Batteries have a finite lifetime. They are unlikely to last the lifetime of the solar PV system, and will need to be replaced when they fail.
- The production of batteries requires energy and the use of hazardous materials. A lot of the materials can be recycled but still have an environmental impact. It is more favourable at the moment to export any excess energy to the grid, offsetting fossil fuel based generation.
- Storage technology, including batteries, will at some point in the not too distant future offer a way of ensuring the variable generation from renewable technologies is utilised more effectively. The independent analysis ‘sustainable energy without the hot air’ suggests that a system utilising pumped water storage, electric vehicles as battery storage and controlled demand could provide a national storage solution[7].
- Commercial battery systems are at this time limited. A UK company, Powervault, is beginning to market a home scale battery storage system. However the system is set to be expensive, with costs of £2800[8] for the battery alone (does not include additional equipment or installation).
- Lithium-air batteries utilising graphene[9] could in the near future revolutionise the battery market place. However at this time these technologies remain at the cutting edge, and not something that you would integrate into a community energy project.

At this moment in time adding battery storage to a community renewable project would increase the risk profile and not provide a robust enough financial case for inclusion. If and when battery systems become standard technology, with a lower risk profile, this would be the time to consider them in community energy projects.

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[5] http://info.cat.org.uk/questions/pv/can-i-store-electricity-my-solar-pv-roof-or-wind-turbine-use-another-time

[6] http://info.cat.org.uk/questions/pv/can-i-store-electricity-my-solar-pv-roof-or-wind-turbine-use-another-time

[7] http://www.withouthotair.com/c26/page_186.shtml

[8] http://www.pv-magazine.com/news/details/beitrag/powervault-raises-11m-in-crowdfunding-for-its-storage-platform_100019983/#axzz3pxqdRFaK

[9] http://www.theecologist.org/News/news_round_up/2986377/liair_battery_could_make_oil_obsolete_in_ten_years.html

Electric vehicle charging

An option for utilising the daytime production from community systems that may generate excess energy may be to install electric vehicle charging points. This would make sense in areas such as the Caen street car park, the Vivian Moon centre and Lobb playing fields/campsite.

It would offer a way of providing a service to visitors and locals and making a positive and practical use of the sustainable energy that is being generated.

Funding may be available for such installations. Energy used by people charging their vehicles could be charged for at a rate higher than the export rate for electricity, but cheap enough that it made sense for them to do it. This would add additional revenue to community projects.

Sustainable transport

The promotion of sustainable transport options for locals and visitors should form part of a sustainable neighbourhood plan. Options such as electric cars and electric bicycles can be integrated with renewable energy systems.

11.0 Conclusions

- The community should proceed with the development of projects that applied for FIT pre-registration with ofgem. The lowest risk option for the development of these projects is through ECoE. With the short timeframe available this Devon based community organisation offer a means to progress the projects quickly to finance and installation. Other alternatives are available for certain projects.
- A second round of community projects could be developed in parallel to the projects that have applied for pre-registration. Efforts here should focus on solar PV projects with the scale and daytime demand to offer reasonable returns on investment.
- Wind generation offers a means of generating significant benefit for the community of Braunton. With high average wind speeds the area has technical viability. However wind is a contentious technology. Any wind project would need to be identified as part of the Neighbourhood Plan process and have the full support of the community. Wind continues to be financially viable under the new FIT regime.
- District wood fuel heating is not financially viable at the Caen car park site.
- Parish Council owned woodland offers an opportunity for community management through a ‘logs for labour’ scheme.
- Community solar PV sites with low daytime electrical demand could install electric vehicle/cycle charging points. This would utilise the energy produced from solar PV systems, provide infrastructure for sustainable transport in the area and improve the financial viability of such sites.
- The hydro sites in and around the village do not offer financially viable sites for development at current energy prices. .