CHAPTER 8.

ENERGY SUPPLY

Increasing renewables, introducing flexibility and capturing carbon

In 2018, 62% of Devon's greenhouse gas emissions related to energy use in the form of electricity and fossil fuel in buildings, manufacturing and construction activity, and transport.[1]

8.1 WHAT NEEDS TO HAPPEN?

The evidence provided at the Thematic Hearings indicated that four key transformations are needed to decarbonise the energy we all use:

1. **Use Less Energy.** We need to reduce demand for energy and use what we really need as efficiently as possible
2. **Transition to Renewables.** The energy we do use needs to be from renewable sources (e.g. wind, solar, biofuel)
3. **Flexibility and Storage.** We need to be able to store electricity and use it more flexibly.
4. **Carbon Capture and storage.** Where small amounts of fossil fuels continue to be used, the carbon emitted needs to be captured and permanently stored to prevent it from reaching the atmosphere.

8.1.1 Use Less Energy

Buildings

Devon needs a high take-up of energy-efficiency measures across its 581,000 homes and its commercial and industrial premises. These technological changes must be combined with enhancing awareness and understanding of energy issues so that behaviour and accepted social norms are changed to help avoid wasting energy and use it more efficiently. These measures are discussed in detail in the Built Environment section of this Plan.

Transport

Using less energy for our transport requirements starts with reducing the need to travel. If the journey is necessary then we must consider using active travel (walking and cycling), buses and trains, shared mobility schemes and taxis (for the first or last mile of a journey), particularly in more urban areas. Private vehicle use will continue, more so for journeys within rural areas and between rural and urban centres; for these, electrification of vehicles will reduce energy demand because an electric vehicle is over four times more efficient than a petrol or diesel car.[2]

However, it is important that petrol and diesel vehicles are not just swapped for electric vehicles due to their resource demands, for instance their use of minerals such as cobalt for battery production. Realising wider behavioural changes towards active travel will also allow for many co-benefits to be realised including to the health and wellbeing[3] of Devon's residents, which a transition solely to EV would not bring forward. These measures are discussed in detail in the Transport section of this Plan.

8.1.2 Transition to Renewables

In 2018, seven percent of the total energy used in Devon for electricity, heat and transport was met by renewable sources[4] . **This needs to rise to near 100% by 2050.**

The Committee on Climate Change scenario for 2050[5] principally advocates electrification of energy (heat and transport) needs. This includes replacing existing vehicles with electric alternatives (instead of petrol or diesel), using heat pumps for heating buildings (instead of gas or oil) and the use of hydrogen production by electrolysis to power heavy goods vehicles, off-road machinery and some industrial processes.

Switching all our heating from fossil fuels to electrically operated heat pumps, and our motorised transport requirements to battery-electric cars and hydrogen heavy goods vehicles is estimated to increase Devon's electricity consumption by about 2.5 times 2018 levels. If Devon were to generate all this new demand within its boundary, approximately eight times[6] more renewable electricity generating capacity would need to be installed on rooftops and through field-scale projects.

In reality this increased need for renewable electricity capacity will be met in part through nationally significant infrastructure, such as new offshore wind farms and in later decades through innovative new technologies, such as wave and tidal energy projects. Devon is a maritime county, the only county with two separate coastlines, and shipyards at Appledore and Plymouth possess marine engineering capabilities and skills that are immediately transferable into offshore energy technologies[7]. The strong potential this position offers and the opportunity to replicate the jobs, supply chain and regional economic benefits that offshore wind has brought to the East of England must be seized. Devon Climate Emergency partners can facilitate the provision of the necessary onshore infrastructure, such as enhanced port infrastructure, cable landings and electricity

distribution and transmission equipment, by continuing to be engaged in regional partnerships innovating in this sector, for example the Great South West floating offshore wind initiative.

Additionally, hybrid heating systems could be appropriate for buildings on the gas network[8] and biomass boilers for buildings off the gas network. Hybrid heating systems use a combination of a heat pump with a boiler fired with green gases (e.g. methane derived from anaerobic digestion or hydrogen from electrolysis) delivered through the existing gas network. These technologies, alongside nationally significant infrastructure, will help reduce the need for new electricity generating capacity.

District heating (systems that distribute hot water, heated by centralised power plants, in a network of highly-insulated pipes to a collection of buildings) supplied by renewable energy also has a role in reducing the need for new electrification too. These must be considered for all large-scale new developments where the distribution pipes and energy centre can be designed in from the outset, or retrofitted in areas of high heat density, such as industrial estates or urban centres.

8.1.3 Flexibility and Electricity Storage

Some renewable energy technologies depend on weather and the seasons – most notably solar photovoltaics (PV) and wind turbines. Solar PV generates electricity during daylight hours and provides most in the middle of the day and summer. Wind turbines generate electricity when the wind is blowing, 24 hours a day, and generally more so in autumn and winter. These periods of generation don't necessarily match the times of higher demand for electricity. Greater deployment of renewable energy technologies combined with uncertainty about how demand for electricity is changing is creating new challenges for distribution system operators[9].

Making best use of renewable resources will need the ability to match the natural variability of renewable energy output with demand by creating improved flexibility and storage of generated energy. The roll out of smart meters that communicate real-time consumption to households and the introduction of flexible, real-time tariffs will encourage people to change behaviour to use electricity when energy supply is higher and demand has traditionally been lower rather than at times when demand is high. Storage solutions, such as batteries connected to the electricity grid, can store energy when supply exceeds demand so that it can be deployed to people when required.

Deploying flexibility services and storage technologies will reduce the amount of new renewable energy capacity required – making best use of the resource, reducing investment costs and avoiding the need for fossil-fuel powered peaking plants.

8.1.4 Carbon Capture and Storage

The Committee on Climate Change believes that using CCS technology will be a necessity, not an option, for the UK to reach net-zero carbon.[5] Large manufacturing and construction industries will need to switch their processes to low-carbon energy sources or make use of carbon capture and storage (CCS) technology wherever possible, although these industries only account for less than 1% of the County's emissions. The Energy from Waste facilities in Devon (which emit 2% of Devon's emissions) will also need to make use of CCS to decarbonise the electricity and heat they currently provide.

CCS can also be used to remove carbon dioxide from the atmosphere by capturing the carbon emitted from using biomass (e.g. maize or willow) for energy; by doing so, between 70% and 100% (dependent on the type of feedstock) of the carbon dioxide that was absorbed from the atmosphere when the biofuel was growing is permanently captured[10] and so achieves negative emissions. This 'bioenergy with CCS' is one of the pillars of the National Farmers' Union's net-zero goal for 2040[11] for the agricultural sector. This approach can be used to offset emissions from other economic sectors that will find it very challenging to decarbonise, too.

8.1.5 Diagram of Energy Supply Actions

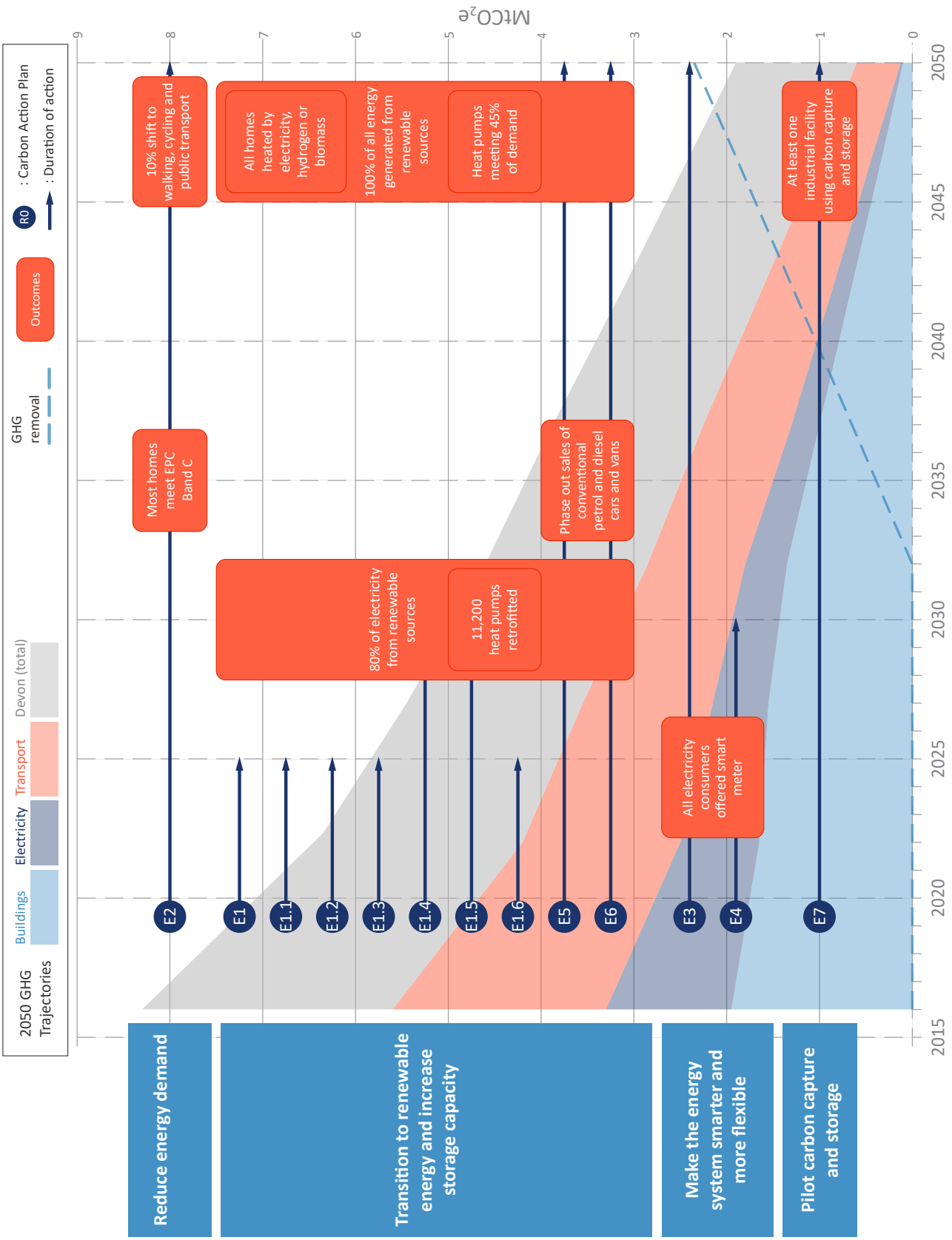

Figure 8.1 Diagram of the Energy Supply Actions, showing the key trajectory for GHG emission reductions over time and the anticipated timing of actions.

8.1.6 Priority Actions

E1. Develop an energy strategy for Devon to deploy renewable energy generation.

8.2 OPPORTUNITIES AND BENEFITS

The transition to a net-zero electricity system, powered by renewable electricity technologies, provides numerous opportunities for Devon residents, including:

- Financial returns on the investment in new renewables. If locally spent, these are a benefit to the local economy. This investment comes from sources including Devon's households, public sector bodies, businesses, banks and pension funds.

- Profits from renewable energy schemes owned by Devon Climate Emergency partners and communities can be invested in other local carbon reducing activity e.g. domestic retrofit, electric vehicle charging points or habitat management for carbon sinks, tackling fuel poverty and supporting vibrant communities.

- Cohesive communities owning key infrastructure become more self-sufficient, and with greater resilience

- The transition of our energy system away from fossil will support up to 192,000 jobs across Devon, Cornwall, Dorset and Somerset. [12]

- The increase in demand for electricity, and new technology use, is going to provide opportunities for reskilling into electrical trades.

- The increased use of smart energy systems, including time of use tariffs and smart meters could lead to lower bills for consumers

- The retention of spending on energy within the Devon boundaries, avoiding over £2 billion pounds a year leaving the local economy

- Reduced air pollution

- Reduced levels of fuel poverty

- Less wasted energy, owing to the increased deployment of smart meters and time of use tariffs Public health benefits, driven by eliminating illnesses related to cold, damp homes and air pollution

8.3 KEY OUTCOMES

- Devon's installed renewable energy and storage capacity increases substantially bringing with it jobs and skills opportunities
- Innovation opportunities have been seized to test offshore technologies, such as floating offshore wind, and hydrogen infrastructure
- Communities become more engaged in local energy issues and energy investment
- New development is expanding Devon's expertise in the use of district heating systems

8.4 GOAL: DEVELOP A SHARED AMBITION FOR RENEWABLE ENERGY GENERATION IN DEVON

32% of Devon's electricity was provided from renewable sources within the County in 2018[4] .Over the past decade, the national Feed in Tariff subsidy helped to increase the attractiveness of rooftop and ground mounted solar PV, which lead to increase in the installed capacity of solar PV. The Joint LEP Energy Strategy[12] prepared by the three Local Enterprise Partnerships (LEP) covering Cornwall, Devon, Somerset and Dorset sets a target for the percentage of electricity generated from renewable sources to rise to 80% by 2030 but acknowledges that social and political support provides localised challenges to deploying projects to meet this target.

Estimates of renewable energy generation potential in Devon suggest that the County has suitable land available (away from sensitive receptors and environmental designations) to meet its own requirements and indeed export to other areas[13].

8.4.1 What Needs to Be Done?

Devon needs to develop an energy strategy to deploy low-carbon energy generation to transition 100% of its energy needs away from fossil fuels. This will send a signal to the market that Devon is ready to facilitate investment and will empower and enthuse organisations, communities and individuals to be part of the transformation and will show how Devon will contribute to implementing the Joint LEP Energy Strategy.

The starting point of the strategy would involve a County-wide review of the potential renewable energy resource available, undertaken for a variety of renewable electricity and heat technologies and scales

with consideration to how the technologies might develop over the period to 2050. This resource potential would then be compared with the future energy consumption and maximum demand requirements of Devon taking into account the implications of the likely success of nationally significant energy projects, flexibility markets, storage technologies, longer-term hydrogen opportunities and relevant government incentives. The strategy must also be developed in partnership with the network operators. The effect of population growth will also need to be considered along with the associated opportunities for district heating to provide combined heat and power to new developments expected to meet this growth.

Communities must be closely involved in the transition. There are already more community energy organisations in Devon than any other County in the UK[14] and these groups generate enough electricity to power over 1,100 homes, having invested more than £14m in their communities and created 33 full time jobs[15]. They own and operate various sizes of installations, from building scale to field scale and they have bold ambition to expand further. Community-owned electricity generation gives local people the opportunity to become actively involved in energy systems and help drive net-zero, capturing more of the benefits in their local area. Many community energy groups are democratic organisations, so people have greater control over which projects get developed and how revenues are distributed, with the community benefitting directly from the reinvestment of profits. Through these benefits, community ownership can help garner support for local projects and the scale of change needed to achieve net-zero. The development of the energy strategy should work closely with the community energy sector to ensure that the economic and social benefits from localising our energy generation are captured in Devon. Under the strategy, Devon Climate Emergency partners and other large electricity consumers should support the sector and contribute to new renewable energy capacity by agreeing to buy their electricity through Power Purchase Agreements and/or offer leases for land to community energy organisations. There are also potential opportunities to be gained from coordinating across geographical borders, with both Cornish and Welsh clusters, to maximise the benefits.

Individuals can help by using less energy, draft proofing and retrofitting homes (to reduce the amount of new renewable energy generation required) moving away from gas towards more renewable forms of heating and installing renewable electricity generation such as solar photovoltaics where appropriate. Community energy organisations across Devon provide impartial home energy advice, and free support for people in fuel poverty through the Cosy Devon domestic energy efficiency partnership with local authorities. Individuals can also stimulate demand for new renewable energy projects by investing in community energy through share offers and switching to electricity and green gas tariffs with suppliers who invest in new renewables.

8.4.2 The Actions:

E1. Develop an energy strategy for Devon to deploy renewable energy generation. The energy strategy should be developed with community involvement and must:

E1.1. **1.1** Update assessments of the accessible renewable energy resource available in Devon.

E1.2. **1.2** Identify opportunities for large-scale renewable energy and storage deployment on land owned or managed by Devon Climate Emergency partners, and wider business community.

E1.3. **1.3** Consider the role of nationally significant energy infrastructure, potentially developed outside of Devon, flexibility markets and storage technologies, and how this could change the total capacity required to be generated within Devon.

E1.4. **1.4** Consider the potential role and feasibility of a hydrogen industrial cluster based around port and fuel storage facilities.

E1.5. **1.5** Support community-owned renewable energy schemes, for example, by offering Power Purchase Agreements and/or leases for land.

E1.6. **1.6** Appraise the potential for low carbon heat networks in new development to make best use of existing heat producers e.g. the Energy from Waste facility in Exeter, and as a retrofit opportunity in off-gas areas.

E2. As part of Devon-wide behaviour and culture change initiatives, provide advice on choosing genuine renewable energy tariffs.

8.4.3 Case Study

Yealm Community Energy

Based in South Devon and a member of the Devon Community Energy Network, Yealm Community Energy (YCE) is a not-for-profit social enterprise, run by local people, doing things differently. It is working towards being able to offer the opportunity to invest in locally generated, clean electricity with profits going into a community fund to support, principally, environmental and social projects in the five parishes bordering the Yealm and Erme estuaries. YCE is looking to acquire one and perhaps two solar farms in its locality.

Newton Downs is the first community solar farm; it generates enough renewable electricity to power the equivalent of 2,000 homes. The project was developed by Good Energy with the understanding that it would be offered for sale to YCE. YCE is now part-owner with Community Owned Renewable Energy (CORE); with local people supporting them they hope to own it completely in 2021.

The second solar farm is at Creacombe; it generates enough power for the equivalent of 2,500 homes. The solar farm will be managed to

encourage wildlife, with the creation of species-rich wildflower meadows around the panels and associated beehives.

Operating costs are being reduced by buying into a cooperative ownership of an asset management company (Bright Renewables), together with a consortium of Community Benefit Societies to keep costs to a minimum.

YCE is aiming to secure loans and a community share offer to raise the sums necessary to acquire one or both of the solar farms.

Financial surpluses from the solar farms will be paid annually to a Community Fund. The fund is for the benefit of the five local parishes by funding local environmental improvements and low carbon energy projects. The value of the community fund could be as much as £45,000 per year for the communities. The overall monetary benefit to the community over the projects' lifetime is up to £3 million.

Since 2018, Yealm Community Energy has provided almost £40,000 for environmental and social projects within the five parishes, and in 2020 has so far provided £10,000 for coronavirus relief.

8.5 OPPORTUNITY FOR DISCUSSION AT THE CITIZENS' ASSEMBLY: Onshore wind energy

Onshore wind farms, and large-scale solar farms are the most affordable way to meet the future, new demand for electricity. They are also the most efficient (due to the area of land required and generating hours) onshore renewable energy technology and have brought with them benefits to the local area in which they are deployed. However, the National Planning Policy Framework only allows wind development in areas identified as suitable within a Local or Neighbourhood Plan, if local impacts are fully addressed and proposals have community backing. This has made it challenging to deploy new wind generation assets. Furthermore, the local experience of North Devon and Torridge District Councils, that attempted unsuccessfully to allocate the whole of their geographies as suitable for wind development in their joint Local Plan, has shown that local opposition to wind development is evident in Devon. This reality shows the gulf that remains between support for onshore wind in principle (80%

of the public support onshore wind and the public submissions received through the Call for Evidence were generally supportive of making more use of onshore wind resources) and practice.

Therefore, it is suggested that the role of onshore wind energy technology in the Devon Renewable Energy Strategy needs to be deliberated at the Citizens' Assembly in order to explore ways to reduce tensions between support for onshore wind energy in theory and practice.

8.6 GOAL: OVERCOME CONSTRAINTS ON THE ELECTRICITY GRID

The electricity grid was designed for centralised power stations that delivered electricity into the national grid for direct distribution to consumers. Over the past decade, the way the grid is used has started to change to reflect the increased amount of decentralised electricity generation, brought about by hundreds of thousands of renewable energy installations. At present there can be more renewable electricity being supplied to the grid from solar PV farms in the middle of the day during the summer than there is local demand.

The age and changing use of the network means that parts of the grid often require reinforcement (upgrading) when new projects need to connect. This can cause a queue for new connections in addition to the costs associated with these reinforcements. These costs are shared between Western Power Distribution (the network operator in the south west of England) and the developer of the new energy installation. While any reinforcement would frequently be expected to enable multiple connections, the cost burden falls most heavily on the initial connectee. This often means projects are not financially viable and investment is deterred[18]. Western Power Distribution has a register on their website for developers to log their interest in working in a consortium with other developers to share costs but take-up has been mixed because of the challenges in aligning projects to commit and move forward together.

8.6.1 What Needs to Be Done?

Using the grid smartly can alleviate some constraint issues while providing other benefits. Options include offering new generators flexible connections that require the generator to reduce their output at certain times of day when demand might be low or other generators are already providing sufficient supply, and encouraging storage technology to be added to the grid. These initiatives are still in their infancy but there are examples of flexibility and storage services already operating in the south west whose expansion offers investable business opportunities. Flexibility must be considered within the proposed Devon Renewable Energy Strategy.

A combination of smart and flexible opportunities, alongside grid reinforcement, will be required to facilitate the increase in renewable energy generation on the network. Western Power Distribution is working with the regulator, Ofgem, to look at what regulatory changes might be needed to allow generators

to share the reinforcement costs so that the hurdle rate for investment in new renewable electricity schemes can be met. Regional partners are engaged in these conversations through the Joint LEP Energy Strategy and Devon Climate Emergency partners must play their part in addressing this barrier.

8.6.2 The Actions

E3. Proactively seize opportunities to test approaches to making the energy system smarter and more flexible.

E4. Through the Team Devon COVID-19 Economy and Business Recovery Prospectus, Devon Climate Emergency Partners to request funding for grid upgrades as part of Covid-19 recovery funding from government.

8.7 GOAL: MAKE THE NECESSARY TRANSFORMATIONS TO THE ENERGY SYSTEM FINANCIALLY ATTRACTIVE

Renewable Heat

The Committee on Climate Change has highlighted that progress on low-carbon heating has been too slow nationally.[5] Subsidy support for renewable heat is currently provided by national government under the Renewable Heat Incentive, although this mechanism closes to new projects in 2021. By 2019 it had only supported 18% of the new heat capacity it was designed to facilitate by 2020, and the installer network has contracted 16% since its launch[19]. The Task Force learned from the Thematic Hearing on Energy and Waste that air source heat pumps do not attract sufficient support from the RHI to make them financially competitive against gas boilers. This has meant that households contemplating replacing an ageing gas boiler has limited financial incentives to invest in this technology.

District heating can enable the developers of larger housing and commercial sites to meet the energy and carbon requirements of building regulations at a lower cost than providing individual home/building solutions[20]. The investment opportunity for district heating schemes nevertheless needs to be attractive enough to developers to balance against the perceived risks, such as: whether building occupants will accept communal heat; uncertainty over the reliability of heat sources; and the new contracting mechanisms which the developer may have little experience with[21]. District heating networks were deployed in new developments to the east of Exeter at Monkerton and Cranbrook and other opportunities southwest of Exeter and in the city centre are actively being explored, but viability issues still need to be overcome for the technology to be deployed more widely.

Domestic Scale Renewable Electricity

Since the closure of the Feed-in Tariff (FiT) scheme in April 2019, there has been no subsidy for small-scale renewable electricity schemes (under 5 Mega-Watts (MW) in capacity). The FiT drove down the cost of small-scale renewable electricity schemes and it was government's expectation that deployment without subsidy would be viable after its closure. However, the Net-Zero Task Force heard from the Thematic Hearing on Energy and Waste that this is not the case and hurdle rates are rarely met either for domestic rooftop solar PV or smaller solar farms. This has meant that over the past 18 months there has been little addition to renewable energy capacity in Devon. In fact, the growth rate of renewable energy capacity in the County has been declining since 2015 when the FiT began to be progressively reduced (Figure 1).

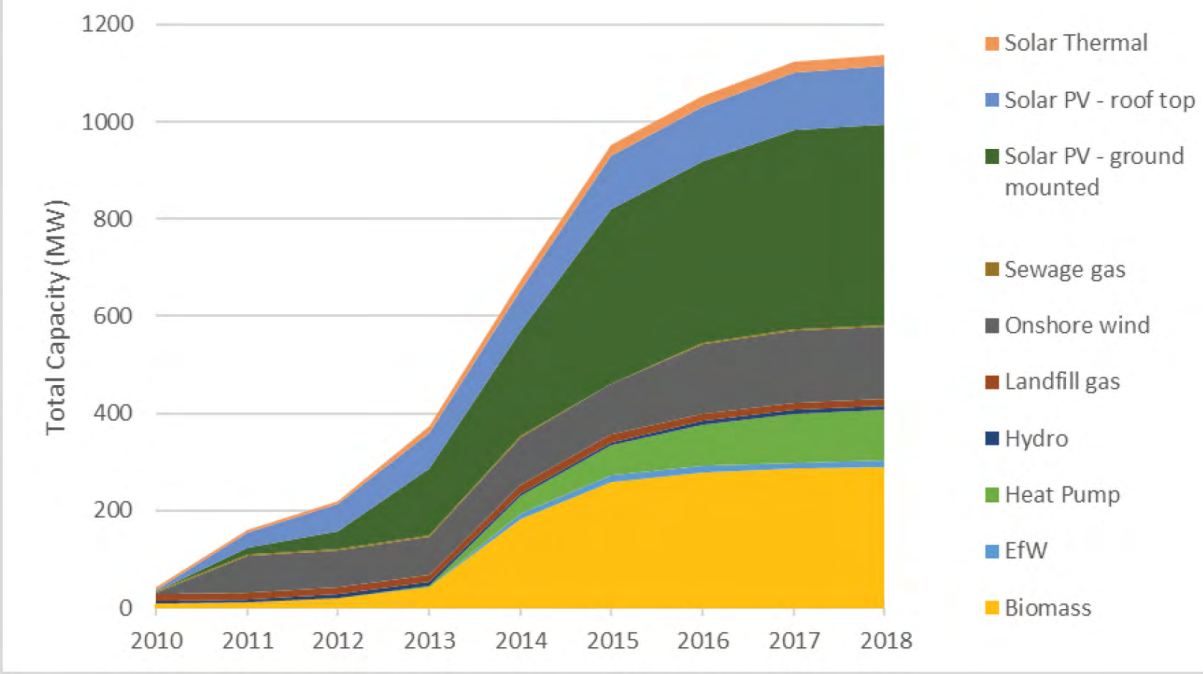

Figure 8.2 - Increase in Renewable Energy Capacity in Devon4

Large-scale schemes over 5MW in capacity can access an alternative subsidy scheme called Contracts for Difference but the scale of these developments is not always suitable in or near sensitive landscapes. This is a particular issue within Devon because of its large areas of valued and protected landscapes.

8.7.1 What Needs to Be Done?

Renewable Heat

The Renewable Heat Incentive is closing to new schemes in 2021 and a follow up scheme urgently needs to be designed by national government to ensure there is appropriate and effective support for the deployment of district heating and other renewable heat products.

Small-Scale Renewable Electricity

National support mechanisms for renewable electricity projects under 5MW need to be reintroduced to return to the growth rates in renewable energy capacity in Devon seen before the demise of the FiT while simultaneously addressing issues that have created local opposition to renewable energy developments.

8.7.2 The Actions

Needing Action Beyond Devon:

E5. Devon Climate Emergency partners to work with national government to provide greater incentives for the use of renewable heat and waste heat from industrial and commercial facilities, including Energy Recovery Facilities.

E6. Devon Climate Emergency partners to work with national government to request the reintroduction of support mechanisms for small-scale renewable electricity generation.

8.8 GOAL: TAKE OPPORTUNITIES TO PILOT CARBON CAPTURE AND STORAGE (CCS) IN DEVON

The first large-scale CCS plant was opened in 1996 in Norway and there are now 18 facilities in operation globally, but the technology is yet to be proven in the UK[22]. National government has committed to deploy CCS in at least two sites by 2030, most likely in coordinated clusters around centres of cement, chemicals, steel and iron manufacturing[23].

8.8.1 What Needs to Be Done?

Devon does not have clusters of the industry types that government is targeting for the first phases of CCS deployment, so piloting of CCS is unlikely to occur in the County over the next decade. However, longer-term the Devon Climate Emergency partners should ensure that government

is aware of Devon's net-zero ambitions and desire to see CCS technology fitted to appropriate installations in the County, such as Energy from Waste facilities.

8.8.2 The Actions

Needing Action Beyond Devon:

E7. Remain engaged with government funding opportunities to pilot carbon capture and storage technology on industrial facilities in Devon, such as the Energy from Waste plants.

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	E1	Develop an energy strategy for Devon to deploy renewable energy generation.	
	E1.1	Update assessments of the accessible renewable energy resource available in Devon	
	E1.2	Identify opportunities for large-scale renewable energy and storage deployment on land owned or managed by Devon Climate Emergency partners, and wider business community.	

8.8.3 Energy Supply Action Summary Table

Figure 8.3 showing the action prioritisation scores, who the action should involve, where it should take place and its financial status

KEY				
Potential Carbon Impact				
High	3			
Medium	2			
Low	1			
		1	2	3
	Ease of implementation	Hard e.g. requiring change in	Medium e.g. requires multi-agency	Relatively easy e.g. local actions

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, National Park Authorities, Businesses, Environmental Organisations, Community Organisations	Will occur everywhere	New local resource required – identified but not secured	Potenital funding by Devon County Council for the Devon Climate Emergency
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, National Park Authorities, Businesses, Environmental Organisations, Community Organisations	Will occur everywhere	New local resource required – identified but not secured	Potenital funding by Devon County Council for the Devon Climate Emergency
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, National Park Authorities, Businesses and Community Organisations, NHS and Public Health, Education Establishments	Will occur everywhere	New local resource required - yet to be identified	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
	E1.3	Consider the role of nationally significant energy infrastructure, potentially developed outside of Devon, flexibility markets and storage technologies, and how this could change the total capacity required to be generated within Devon.	
	E1.4	Consider the potential role and feasibility of a hydrogen industrial cluster based around port and fuel storage facilities.	
Finance, economy & resoruce access	E1.5	Support community-owned renewable energy schemes, for example, by offering Power Purchase Agreements and/or leases for land.	
Spatial Planning; Knowledge sharing, skills and learning	E1.6	Appraise the potential for low carbon heat networks in new development to make best use of existing heat producers e.g. the Energy from Waste facility in Exeter, and as a retrofit opportunity in off-gas areas.	
Behaviour transformation and community engagement	E2	As part of Devon-wide behaviour and culture change initiatives, provide advice on choosing genuine renewable energy tariffs.	
	E3	Proactively seize opportunities to test approaches to making the energy system smarter and more flexible.	
	E4	Through the Team Devon COVID-19 Economy and Business Recovery Prospectus, Devon Climate Emergency Partners to request funding for grid upgrades as part of Covid-19 recovery funding from government.	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council	Will occur everywhere	New local resource required – identified but not secured	Potenital funding by Devon County Council for the Devon Climate Emergency
	County Council, Unitary Councils and Businesses	City and Town	New local resource required – identified but not secured	Potenital funding by Devon County Council for the Devon Climate Emergency
	County Council, Unitary Councils, District and Borough Councils, Community Organisations, Education Establishments, Businesses	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils	City and Town	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, Community Organisations, Businesses, Individuals	Will occur everywhere	New local resource required - yet to be identified	
	Team Devon and Devon Climate Emergency Partners	Will occur everywhere	New local resource required - yet to be identified	

Cross Cutting Theme	Action Number	Action	Prioritisation Score
Finance, economy & resource access	E5	Devon Climate Emergency partners to work with national government to provide greater incentives for the use of renewable heat and waste heat from industrial and commercial facilities, including Energy Recovery Facilities.	
Finance, economy & resource access	E6	Devon Climate Emergency partners to work with national government to request the reintroduction of support mechanisms for small-scale renewable electricity generation.	
Finance, economy & resource access; Knowledge sharing, skills and learning	E7	Remain engaged with government funding opportunities to pilot carbon capture and storage technology on industrial facilities in Devon, such as the Energy from Waste plants.	

	Who Does this Action Involve?	Where Should This Action Take Place?	Financial Status	Potential Funding Stream Where Identified
	County Council, Unitary Councils, District and Borough Councils, Businesses	Will occur everywhere	New local resource required - yet to be identified	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils, National Park Authorities, Businesses	Will occur everywhere	Within existing resources	
	County Council, Unitary Councils, District and Borough Councils, Town and Parish Councils	Will occur everywhere	New local resource required - yet to be identified	

[1] T. A. Mitchell, October 2020, Devon Greenhouse Gas Emissions 2018, CENTRE FOR ENERGY AND THE ENVIRONMENT

[2] US Department of Energy (Unknown), Where the Energy Goes: Electric Cars [online]. URL: https://www.fueleconomy.gov/feg/atv-ev.shtml and Where the Energy Goes: Gasoline Vehicles [online]. URL: https://www.fueleconomy.gov/feg/atv.shtml, Accessed 30 th August 2020

[3] Morgan,J. July 2020, Electric vehicles: the future we made and the problem of unmaking it, Cambridge Journal of Economics, Volume 44, Issue 4, , Pages 953–977, https://academic.oup.com/cje/article/44/4/953/5859377

[4] Data calculated by the Net Zero Task Force

[5] Committee on Climate Change (2019), Net-Zero – The UK's Contribution to Stopping Global Warming. Committee on Climate Change. Available at https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

[6] Preliminary calculations by the Net-Zero Task Force

[7] Cornwall and Isles of Scilly Local Enterprise Partnership (2018) Floating Offshore Wind in the Great South West

[8] Navigant (2020), Benefits of Hybrid Heat Systems in a Low Carbon Energy System. Reference No. 214662

[9] Western Power (2018), The Future of Our Electricity Network – Consultation to Engage Communities in Future DSO Strategy, Western Power. Available at: https://www.westernpower.co.uk/downloads/5369

[10] Fajardy, M. et al. (2019), BECCS Deployment: A Reality Check. Grantham Institute, Imperial College, London. Available at https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/BECCS-deployment---a-reality-check.pdf

[11] NFU (2019) Achieving Net-Zero, Farming's 2040 Goal. NFU. Available at: https://www.nfuonline.com/nfu-online/business/regulation/achieving-net-zero-farmings-2040-goal/

[12] Carbon Trust (2019), Cornwall and Isles of Scilly, Dorset and Heart of the South West Local Enterprise Partnership's Joint LEP Energy Strategy Framework. Available at https://dorsetlep.s3.amazonaws.com/Strategic%20Sites/HotSW,%20Dorset,%20CIoS%20Joint%20LEP%20Energy%20Strategy%20Framework.pdf

[13] D. Lash, A. Norton & T. A. Mitchell, August 2020, Net Zero Devon, Plymouth and Torbay, CENTRE FOR ENERGY AND THE ENVIRONMENT, Internal document 989

[14] Regen (2018), Devon Community Energy Impact Report, Regen, commissioned by Devon County Council, available at https://www.regen.co.uk/publications/devon-community-energy-impact-report-2018/

[15] The average UK home uses 12,000kWh of gas and 2,900kWh of electricity. This totals 14,900kWh of energy. Community energy organisations in Devon generate 17,431 MWh of electricity. 17,431/14,900 = 1170 houses.

[16] BEIS (2020), Electricity Generation Costs 2020, BEIS. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911817/electricity-generation-cost-report-2020.pdf

[17] BEIS (2020), BEIS Public Attitudes Tracker, BEIS. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/884028/BEIS_PAT_W33_-_Key_findings_Final_.pdf

[18] Ofgem (2016) Unlocking the Capacity of the Electricity Networks. Ofgem. https://www.ofgem.gov.uk/ofgem-publications/111164

[19] Regen (2019), Decade to Make a Difference Series: The Decarbonisation of Heat, https://www.regen.co.uk/publications/decarbonisation-of-heat/

[20] A. Rowson and A. Norton (2015), Wolborough Urban Extension Newton Abbot – An Initial Feasibility Assessment of Site Wide District Heating and Combined Heat and Power, Centre for Energy and the Environment, Internal Document 900

[21] Department for Energy and Climate Change (2013), Research into Barriers to Deployment of District Heating Networks, DECC, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/191542/Barriers_to_deployment_of_district_heating_networks_2204.pdf

[22] Grantham Research Institute (2018), What is Carbon Capture and Storage and What Role Can it Play in Tackling Climate Change? [online], URL: https://www.lse.ac.uk/granthaminstitute/explainers/what-is-carbon-capture-and-storage-and-what-role-can-it-play-in-tackling-climate-change/ Accessed 9/9/2020

[23] BEIS (2020), Carbon Capture, Usage and Storage. A Government Response on Potential Business Models for Carbon Capture, Usage and Storage. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/909706/CCUS-government-response-business-models.pdf