

Report to Communities, Highways and Environment Scrutiny Committee

24 November 2021

2030 Energy Strategy

Report by Energy Services Manager

Electoral division(s): All

Summary

A new Energy Strategy has been developed to guide the County Council's work on energy up to 2030, the year when the county council has committed to be Net Zero in terms of its own emissions of carbon dioxide. This Strategy has built upon the priorities identified in the previous strategy (emissions reduction, renewable energy, fuel poverty and commercial services) and developed them further. It has also reflected the county council's Climate Change Strategy and the Council Plan.

Priorities within the strategy reflect the county council's role in delivering the 'Leading the Way' scenario as defined by National Grid's 'Future Energy Scenarios' annual report.

Engagement with officer subject matter experts in West Sussex districts and borough councils has demonstrated support for the priorities and ambition outlined in the strategy.

Proposed Focus for Scrutiny

- (1) To consider whether the rationale for the chosen scenario is justified and if it is the best fit for the County
 - (2) How have the County Council's priorities changed in relation to climate change matters since the implementation of the previous strategy agreed in 2016?
 - (3) What support is the County Council providing to households affected by fuel poverty and what does the future look like if central government funding is cut?
 - (4) Is the strategy ambitious and deliverable?
-

Proposal

1 Background and context

- 1.1 West Sussex County Council agreed an energy strategy in 2016 which put forward four priority areas for action including:

- Reduce energy consumption and improve energy efficiency of our buildings
- Integrate low-carbon energy generation technology and infrastructure into our assets
- Work in partnership to tackle fuel poverty in the county; and
- Develop the commercial provision of energy-related services in the county.

- 1.2 By delivering this strategy, the county council has developed solar farms and battery storage assets, rolled out solar panels across corporate and school buildings, delivered energy efficiency upgrades, funded Emergency Fuel Vouchers for households in the county experiencing fuel poverty, improved access for homeowners to solar PV panels, contributed to national and international research on new ways to manage energy and develop Local Energy Communities who can take ownership of the energy transition at a local level.
- 1.3 In 2020, the county council developed and adopted a new Climate Change Strategy and action plan that will outline the county council's actions on climate change up to 2030. One critical ambition in that strategy was that it should form the framework for other county council strategies and policies to reflect.
- 1.4 A new high level energy strategy has been developed to ensure the county council's activities relating to energy are aligned to the priorities described in the climate change strategy. It focuses on the specific role that energy and energy infrastructure plays in (a) helping the council to achieve net zero emissions from its operations by 2030 and (b) supporting our communities to achieve net zero emissions.
- 1.5 National Grid, in its role as Electricity System Operator for Great Britain, has produced a range of credible energy transition pathways under its 'Future Energy Scenarios' programme. These pathways achieve Net Zero emissions at differing speeds and through different sets of energy infrastructure. The scenario that most closely aligns with the county council's climate change strategy is 'Leading the Way'.
- 1.6 The new energy strategy has been developed to help deliver the county council's climate change ambitions up to 2030 following the energy infrastructure developments identified in the 'Leading the Way' scenario.
- 1.7 The priorities identified in the former energy strategy have been retained but added to and developed to deliver the county council's climate change strategy ambitions and the priorities in the 'Our Council Plan'.
- 1.8 The county council is already following the 'Leading the Way' scenario in that it has invested in Net Zero-compatible energy assets (i.e., smart metering, energy efficiency through insulation, LED lighting, solar and battery storage assets) and supported positive consumer behaviours (i.e., cost-effective solar panel installations for householders through the Solar Together Sussex scheme and support for Local Energy Communities through the LECSea project).

2 Proposal details

- 2.1 It is proposed that the Communities, Highways and Environment Scrutiny Committee considers and endorses the draft energy strategy which is based upon the 'Leading the Way' scenario described by National Grid in the Future Energy Scenarios (2021).

3 Consultation, engagement and advice

- 3.1 The Cabinet Member for the Environment and Climate Change has been consulted during the development of the draft strategy. The draft strategy has been presented to the county council's Executive Leadership Team (28/10/2021) and Cabinet Briefing (02/11/2021) and updated based on the feedback received.
- 3.2 The draft strategy has also been subject to a closed consultation with subject matter experts (officers working in Energy, Property, Highways & Sustainability) from within the County Council and district and borough partners. Responses were received from 4 district and borough partners as well as the West Sussex Fuel Poverty Coordinator (hosted by Arun District Council).
- 3.3 There was general support for the priorities within the strategy and, in particular, significant interest from partners to foster closer working on the development of sustainable energy projects within the county, building on the success of the Solar Together Sussex scheme.
- 3.4 Subject to approval, the Energy Strategy will act as a springboard for a detailed piece of work to develop an action plan which identifies the specific projects, actions, timescales, costs and resources required to deliver this strategy by 2030. That action plan will be subject to public consultation and will be submitted to this committee for scrutiny.

4 Finance

- 4.1 It is too early to fully assess the financial consequences of the adoption of this draft strategy. This assessment will take place within a follow up action planning process. However, the existing Sustainable Energy programme has an existing allocation of £42m Capital funding dedicated to the development of new energy assets. Projects that pay back in circa. 12 years are developed, subject to the approval of a full business case. All projects are expected to generate income in excess of the financing costs in Year 1.
- 4.2 A further £10m has been allocated to climate change work on the county council's assets. This is primarily being used to improve energy efficiency and decarbonise heating in buildings.
- 4.3 In addition, the county council holds an 'Invest to Save' fund which generates savings for the corporate utilities budget and reinvests those savings into new energy efficiency projects. The use of this fund has recently been expanded to support schools to make similar financial savings (primarily through projects using LED lighting).

4.4 The Fuel Poverty fund is replenished through the collection of a management fee attributable to the county council's role in delivering public-facing marketing exercises, such as the Solar Together Sussex scheme. The economies of scale achieved through 'group purchase' of energy assets, such as solar panels, mean that a small share of the savings can be redirected to the fund which is administered in partnership with district and borough councils.

4.5 The effect of the proposal:

(a) **How the cost represents good value**

The proposal outlines how the energy element of the County Council's work on climate change will be delivered. Adopting an industry-recognised energy scenario to guide future investment will deliver good value to the council by ensuring that only the most appropriate and robust technologies are selected.

There is a low risk of the county council investing in energy assets that cannot be used in a Net Zero environment.

(b) **Future savings/efficiencies being delivered**

It is not possible at the current time to have a clear view of the scale of savings or avoided costs attributable to this strategy. Specific savings will be identified on a project-by-project basis through the development of the business case.

However, previous experience in this area has shown that energy efficiency work has delivered savings to the county council's utilities budget while the Sustainable Energy assets have minimized the council's exposure to volatile energy market conditions.

Further savings have been realised by partners and consumers through support for the installation of solar PV on 3rd parties' rooftops as well as Emergency Fuel Vouchers from the Fuel Poverty Fund.

Additional benefits from energy projects are sought through application of the Social Value Framework and the engagement, where appropriate, of local supply chains.

(c) **Human Resources, IT and Assets Impact**

The primary impact of this strategy will be on the county council's assets which will, through an improved energy efficiency rating along with on-site renewable generation of energy, support the council to achieve Net Zero, as reference by the council's Climate Change Strategy.

The council's Energy Services Team will be primarily responsible for the delivery of this strategy and capacity within that team will be kept under review throughout the life of this strategy. The team has sufficient capacity to deliver the existing pipeline of projects.

Issues of the council's capacity to achieve Net Zero is being assessed separately and this strategy will engage with that process.

5 Risk implications and mitigations

Risk	Mitigating Action (in place or planned)
Partners' capacity to support collaboration and shared projects	An assessment of partner's capacity to support collaboration will be undertaken before the precise nature of the collaboration is established.
Availability of further finance following current allocation	Savings attributable to projects delivered under the strategy will be highlighted to demonstrate value to the council. Any bids for further funding will also be based on a positive financial business case.
Availability of viable projects or sites	Where the availability of council-owned land is likely to diminish over time, partnerships with 3 rd parties will be explored as a route to continue development work
Availability of technologies and supply chain to deliver	The council will take a broad approach toward market engagement so that it has a clear understanding of the supply chain constraints before individual projects are commissioned

6 Policy alignment and compliance

- 6.1 This strategy is aligned with the county council's corporate plan "Our Council Plan" and will specifically support delivery of Outcomes 1 (Resetting and rebooting the local economy) and 5 (A sustainable economy that adapts to climate change) of the county council's priority 'A sustainable and prosperous economy'.
- 6.2 This Strategy will also support delivery of Outcome 5 (Working in Partnership) of the 'Making the best use of resources' priority.
- 6.3 Key benefits identified in the Climate Change Strategy will be part-delivered through this strategy including (1) A greater and greener local economy; (2) Reduced bills and (3) Energy security.

Steve Read

Director of Environment and Public Protection

Contact Officer: Dr. Daire Casey, Energy Services Manager Tel: 0330 2223005, daire.casey@westsussex.gov.uk

Background papers

Appendices

Appendix 1: Draft Energy Strategy

Appendix 1: Draft Energy Strategy

2030 Energy Strategy

Our Vision

“By 2030, West Sussex County Council will have actively supported a resilient and equitable local energy transition through decarbonisation of energy sources and the delivery of projects which have enabled economic development and contributed to the needs of our communities”.

Introduction

Climate Change is one of the biggest challenges we will ever face in our county. The 2018 report from the United Nations Intergovernmental Panel on Climate Change concluded that without substantial efforts to curb greenhouse gas emissions over the next decade we are likely to face severe, widespread, and irreversible impacts on societies.

In response to this, West Sussex County Council acknowledged the threat of climate change and passed a motion pledging to try to reach net zero carbon emissions by 2030, adopting a new [climate change strategy](#) in 2020 which set out five priorities:

- mitigate the effects of climate change by reducing carbon emissions
- adapt and be resilient to a changing climate
- source and use resources sustainably
- support and grow our local green economy
- transform how we work.

The strategy also recognises that, due to the county council’s unique position, it has three critical opportunities to act by:

- showing leadership - taking the lead by making positive changes to our own assets, its operations and its contracts
- enabling - enabling our communities, our suppliers and partnerships to live and work in different ways by making decisions, setting policies and strategies and spending our budgets in ways that create and unlock opportunities for all of us.
- influencing - using our influence to engage with others to make changes beyond what we control.

The Council strengthened its commitment to action on this agenda by making climate change an overarching priority in its Council Plan in 2021. The Energy Strategy will play a key role in achieving our corporate targets.

Other organisations have similarly responded to the need to reach net zero emissions and the Electricity System Operator for Great Britain (National Grid ESO) has set out a range of '[Future Energy Scenarios](#)' that chart the specific energy transitions required to achieve net zero by 2050. The 'Leading the Way' scenario is the county council's preference as it poses [least risk of missing the Net Zero target](#) and achieves the greatest reduction in emissions of carbon dioxide in the shortest amount of time.

Partner local authorities in West Sussex have also developed, or are in the process of developing, climate change strategies to meet the net zero target.

The Strategy

This strategy identifies how the county council's climate change commitments will be met in part through the decisions it takes related to energy. The ambition set out here is aligned with the local energy transition required to meet the 'Leading the Way' scenario set out by National Grid in their [Future Energy Scenarios \(2021\)](#) document.

In order to deliver this strategy, the county council will focus on four priority areas:

1. Sustainable energy

- a. We will develop, and support our partners to develop, more sustainable energy generation and (heat) networks in West Sussex which will contribute to the decarbonisation of energy (heat and power) in the county.
- b. We will use mature technologies such as solar, battery, wind and heat pumps as well as new and emerging technologies over the course of the strategy (i.e. hydrogen technologies).
- c. Our projects will support the strategic direction of key stakeholders including
 - i. National Grid's 'Leading the Way' Future Energy Scenario;
 - ii. Local Distribution Network Operators' (DNOs') Future Energy Scenarios (UK Power Networks and Scottish and Southern Energy Networks);
 - iii. District and Borough Councils' Climate Change Strategies;
 - iv. Coast 2 Capital Local Enterprise Partnership's 'South2East' Energy Strategy;
 - v. Neighbouring local authorities; and
 - vi. Community Energy groups within the county.
- d. We will use our procurement of energy to drive further deployment of sustainable energy generation within the county – be that from our own projects, or those of our partners or Community Energy Groups/Local Energy Communities.

Exemplar Project 1: Sustainable Energy Generation at West Sussex County Council

The county council has advocated for the local generation of renewable energy, investing in two solar farms (at Tangmere and Westhampnett) that generate more electricity than the county council's corporate operations require. The solar farm at Westhampnett received a commendation in the category of Special Award for Contribution to Net Zero from the industry body, the Association for Decentralised Energy.

2. Emissions reduction

- a. Our energy projects will seek to identify the most viable technologies for our own property portfolio and suitable funding to enable delivery.
- b. A new Future Energy Transition Hub will be established to support dramatic emissions reductions in the county council's buildings and across the county.
- c. Opportunities for decarbonisation in sectors over which the county council has greatest influence (e.g. Bus Services Improvement Plan, EV ChargePoint rollout) will be prioritised. This may include supply, facilitation of project development or other contributions to progress in this important area.

Exemplar Project 2: Emissions reduction at West Sussex County Council

In 2006, the county council was one of the first public sector organisations to develop an 'Invest to Save' fund to drive emissions reductions in its buildings with Salix Finance. Financial savings on utility costs from energy efficiency projects are recycled to be used to fund further efficiency measures. Using this fund, the council was able to halve its carbon footprint and keep energy costs manageable when prices rose.

3. Social Value from Energy

- a. Our energy projects will support council finances through cost reduction/cost avoidance or income generation to ensure public services are protected.
- b. An equitable transition to sustainable energy will be secured through collaborative projects with partners that provide businesses and residents with affordable options to procure technologies such as rooftop solar panels and battery storage options.
- c. Financial support from energy projects will support organisations working to alleviate the incidence of fuel poverty in West Sussex.
- d. Local ownership of the energy transition will be enhanced through the development of Community Energy Groups and Local Energy Communities.

Exemplar Project 3: Social Value from Energy at West Sussex County Council

The incidence of fuel poverty in West Sussex stimulated the development of a Fuel Poverty Fund, into which surplus income from energy projects ranging from a set of energy tariffs to the Solar Together Sussex group purchasing scheme. The Fuel Poverty Fund has enabled our partners to provide support to vulnerable residents in West Sussex experiencing a financial crisis.

4. Local Energy Resilience

- a. We will evaluate the readiness of the local distribution network to meet the net zero challenge and target our grid-connected battery storage projects to support local energy resilience.
- b. Energy assets (e.g. battery storage and smart devices) located within our properties and those of our partners will be supported to provide flexibility to local distribution networks.
- c. We will use energy efficiency projects to proactively return surplus electrical capacity to the local distribution network.

Exemplar Project 4: Local Energy Resilience at West Sussex County Council

Large scale battery storage allows the electricity grid to be balanced (matching the supply of power with demand on a second-by-second basis) without the need for carbon-intensive gas turbines to be deployed. Since it was energised, the battery storage system at Westhampnett has delivered flexibility to the electricity grid which has allowed it to be more resilient to shocks such as unplanned outages from power stations or the flow of electricity across international interconnectors being suddenly interrupted.

Supporting these four priority areas, the county council will also deliver a fifth area:

5. Sustainable income generation, savings and cost avoidance

- a. We will identify opportunities to generate sustainable income for the county council through savings on corporate utilities costs, sale of energy, provision of energy and flexibility services and identification of avoided future costs

Delivery

Delivery of the priority areas described above will be supported through an increased focus on:

1. Collaboration
 - a. The council will develop a collaborative business relationship management system
 - b. The council will support other organisations to lead on action, where appropriate, through the development of Local Energy Communities
 - c. The council will invest in the necessary platforms, tools and support functions to help Local Energy Communities achieve their aims.

2. Data Management
 - a. The council will develop a data quality management system
 - b. The council will make publicly available all appropriate datasets relating to the projects delivered and energy assets developed.
 - c. The council will use data management to develop and share insights into successful projects to support their rapid replication.
 - d. The council will develop a data management offer to Local Energy Communities.

3. Innovation
 - a. The council will develop an Innovation Management System.
 - b. The council will support other organisations to innovate through the application of lessons learned when developing energy projects.
 - c. The council will support the controlled trial of emerging technologies, markets and business models where appropriate.

Policy Alignment

- This strategy is aligned with the county council's corporate plan "Our Council Plan" and will specifically support delivery of Outcomes 1 (Resetting and rebooting the local economy) and 5 (A sustainable economy that adapts to climate change) of the county council's priority 'A sustainable and prosperous economy'.
- This Strategy will also support delivery of Outcome 5 (Working in Partnership) of the 'Making the best use of resources' priority.

Key benefits identified in the Climate Change Strategy will be part-delivered through this strategy including (1) A greater and greener local economy; (2) Reduced bills and (3) Energy security.

This Strategy supports achievement of those benefits by delivering on the following specific commitments made in the Climate Change Strategy:

- Commitment 1 (a): We will be a net carbon zero organisation by 2030

- Commitment 1(c): We will increase the amount of renewable energy used and generated in West Sussex
- Commitment 3 (a): We will use resources efficiently and economically
- Commitment 4 (c): We will encourage sustainable businesses
- Commitment 5 (e): We will challenge and support others to follow our example
- Commitment 5 (f): We will work in partnership to find innovative solutions and collaborative ways of working to tackle climate change.

Governance

Following adoption of the Climate Change Strategy, the county council established a Climate Change Board, chaired by the Executive Director for Place. Its corporate role is to:

- establish the initial work programme needed and identify and secure the resources to deliver it;
- oversee delivery against the commitments set out in the climate change strategy;
- hold the organisation to account and ensure progress is being made at the pace we want and need.

The governance of this strategy will fall within the remit of the governance structure for the existing West Sussex Climate Change Strategy.

Funding

The county council has committed £42m to delivery of the ongoing programme of work on sustainable energy. It has supplemented this investment with circa. £500k grant funding from Salix Finance, the European Union, Innovate UK and, most recently, Government's Public Sector Decarbonisation Scheme. These funding streams will continue to be used to deliver this strategy as follows:

1. Corporate capital resources
 - a. The council will use its own capital resources to invest in sustainable energy generation and storage assets which will generate benefits for the local energy networks and communities as well as a financial return for the council.
2. Grant funding
 - a. The council will use grant funding to
 - i. Deliver energy efficiency measures
 - ii. Support the deployment of sustainable energy generation and storage assets
 - iii. Support the development of Local Energy Communities
3. Surplus income from sustainable energy projects
 - a. The council will use surplus income from sustainable energy projects to

- i. Invest in the underpinning mechanisms that support delivery of this strategy
- ii. Support action on fuel poverty within the county

Measuring and reporting progress

The measurement of progress toward delivery of this strategy will be developed in line with the Data Quality Management System identified above. The contribution of this strategy toward Our Council Plan will be measured and reported by assessing:

- The number of Enterprises supported to start, revive, innovate and grow
 - Key Performance Indicator Number 15 for Outcome 1 of 'Our Council Plan' priority 'A sustainable and prosperous economy' and

- The equivalent tonnes (te) of CO₂ emissions from WSCC activities
 - Key Performance Indicator Number 22 for Outcome 5 of 'Our Council Plan' priority 'A sustainable and prosperous economy'

- The percentage of contracts valued over £500k where the opportunity to work in partnership has been appraised
 - Key Performance Indicator Number 52 for Outcome 5 of 'Our Council Plan' priority 'Making best use of resources'

Energy Strategy Appendix 1: Glossary

Community Energy Groups: Community energy groups aim to deliver community-led renewable energy, energy demand reduction and energy supply projects, whether wholly owned and/or controlled by communities or through a partnership with commercial or public sector partners.

Distribution Network Operators (DNOs): DNOs are responsible for ensuring that distribution networks (operating at lower voltages than the Electricity Transmission (ET) network) are able to deliver for the needs of customers in their respective geographical area. DNOs are responsible for investment and innovation across their networks and coordinate development with Ofgem and National Grid in those areas.

Electricity System Operator (ESO): The Electricity System Operator (ESO) is responsible for several important functions relating to the management of the electricity network; from second-by-second balancing of electricity supply and demand, to developing markets and advising on network investments. The ESO has an important role to play in the UK's transition to a decarbonised, decentralised and digitalised energy system. In Great Britain, this role is undertaken by National Grid ESO.

Electricity Transmission (ET): the high-voltage electricity transmission network in England and Wales. Following generation (often in large, centralised power stations) electricity is transported at high voltage across England and Wales through the Electricity Transmission Network. This network is owned by National Grid Electricity Transmission (ET).

Future Energy Scenarios: Future Energy Scenarios (FES) represent a range of different, credible ways to decarbonise the energy system of the United Kingdom. They are updated annually by the Electricity System Operator (National Grid ESO). They provide the basis for the network investments outlined in the Electricity Ten Year Statement and Gas Ten Year Statement.

Future Energy Transition Hub: A one stop shop and single point of contact for all aspects relating to the decarbonisation of energy as it relates to the buildings and the county of West Sussex.

Local Energy Community: An association, cooperative, partnership, non-profit organisation or other legal entity composed of consumers (or 'pro-sumers'), formed to meet a community's energy needs using solely or primarily local sources of generation. The community could comprise of representatives from domestic or commercial properties as well as the county council's own properties in a defined local area

Ofgem: The Office of Gas and Electricity Markets (Ofgem) is the independent energy regulator of Great Britain. It is responsible for (a) working with government, industry and consumer groups to deliver a net-zero economy, at the lowest cost to consumers; (b) stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable; and (c) enabling competition and innovation, which drives down prices and results in new products and services for consumers.

Partners: Partners constitute any organisation with whom the county council works on an ongoing basis to achieve this strategy, including but not limited to District Councils, Borough Councils, Parish Councils, the county council's geographic neighbours and statistical neighbours, Statutory Undertakings within West Sussex, Universities, suppliers and contractors to the county councils, Local Energy Communities and Community Energy Groups, Businesses, and advocacy groups.

Energy Strategy Appendix 2: Version Control

Version	Date	Description
0.01	26/08/2021	Initial draft
0.02	27/09/2021	Updated to reflect EPP Director's comments
0.03	29/09/2021	Updated to reflect Cabinet Member's comments
0.04	19/10/2021	Updated wording on funding sources
0.05	25/10/2021	Updated to reflect Executive Leadership Team comments
0.06	26/10/2021	Updated to reflect comments from Executive Director of Place
0.07	27/10/2021	Updated to reflect additional comments from Place Directorate Leadership Team
0.08	16/11/2021	Updated to reflect comments from Legal Services

Appendix 2: Energy Scenario analysis to support 2030 Energy Strategy

Report by Energy Services Manager

Summary

The county council has developed an Energy Strategy to support action on climate change until 2030. National Grid, the Electricity System Operator for Great Britain, has developed 4 'Future Energy Scenarios' which identify how new and focused investments in energy infrastructure can support delivery of the Government's strategy on Net Zero.

The county council has identified one of these scenarios ('Leading the Way') as being most suited to help the council direct activities locally and achieve Net Zero by 2050. An analysis of the options and the reasoning for adoption is presented in this report.

Proposal

1 Background and context

- 1.1 The UK is the first major economy in the world to pass laws to end its contribution to global warming by 2050. The Government's strategy to reach Net Zero emissions of greenhouse gases has been described by the Committee on Climate Change (an independent, statutory body established by the Climate Change Act 2008) as "an ambitious and comprehensive strategy that marks a significant step forward for UK climate policy, setting a globally leading benchmark".
- 1.2 The specific role of the energy sector in supporting the UK to deliver this objective whilst maintaining reliable and affordable energy has been explored by National Grid (the Electricity System Operator for Great Britain). Recognising that there is not one single path to achieve Net Zero, National Grid have described a range of coherent and credible future scenarios as well as the possible national infrastructure changes required to achieve them.
- 1.3 Each scenario describes how, and how quickly, potential changes in (a) the energy system and (b) consumer behaviour will impact on the Government ambition to meet its Net Zero responsibilities. These are:
 - The 'Steady Progression' scenario assumes low investment in energy system upgrades and low change to consumer behaviour.
 - The 'System Transformation' scenario assumes a high level of investment in energy system upgrades but low levels of engagement with consumers.
 - The 'Consumer Transformation' scenario assumes a high level of consumer engagement but low levels of investment in energy system upgrades.
 - The 'Leading the Way' scenario assumes a high level of investment in energy system upgrades and a high level of engagement with consumers.

- 1.4 National Grid use these scenarios to support their network planning as both the Electricity System Operator and the Gas System Operator and they are referred to throughout their strategic planning documents, or 'Ten Year Statements'. They update their scenarios on an annual basis and consult widely with stakeholders to understand the extent to which both energy system upgrades and consumer engagement are progressing.
- 1.5 West Sussex County Council has demonstrated leadership regarding local action on climate change over many years. The county council developed one of the first solar farms to be owned and run by a local authority in the UK at Tangmere. Further projects have included a rooftop scheme for tenants of social housing, the Solar for Schools programme supporting schools to use more renewable electricity and an additional solar farm & battery storage system at Westhampnett.
- 1.6 The county council performs a number of roles in the local energy system including that of consumer, investor, developer and asset owner/manager. More broadly within the energy system, the county council also supports consumers experiencing fuel poverty, plays a role in supporting local economic development and acts as an enabler in other areas. These include the roll out of a public EV charging infrastructure across the county, the deployment of solar panels on homes in West Sussex (as well as East Sussex and Brighton & Hove), and in attracting funding to support the development of Local Energy Communities.
- 1.7 Reducing emissions of carbon dioxide is a priority for the county council, established through the Climate Change Strategy (2020) and confirmed as an overarching priority in the Council Plan (2021).
- 1.8 An options appraisal of the four scenarios (Appendix 1) sets out an assessment of their relative impact on 13 key metrics. These include speed of decarbonisation, resilience of the energy system and cost to manage, potential for West Sussex-based technologies and communities to contribute to national action on climate change, and support for Government's Policy).
- 1.9 'Leading the Way' has been identified as the scenario that describes the preferred model of infrastructure development and support for consumer behaviour change in the county. The type of consumer behaviour envisaged in each scenario has also been described by National Grid (Appendix 2).

2 Proposal details

- 2.1 It is proposed that 'Leading the Way' is adopted as the base template for the county council's Energy Strategy for 2021 - 2030.
- 2.2 Following this scenario, the Energy Strategy would support the county council to play its part in helping the UK to reach Net Zero as early as 2047 rather than 2050 and to eventually reduce emissions nationally by 103% by 2050 compared to 1990 levels (equating to annual net emissions of -28 MtCO₂e nationally by 2050).

Energy Scenario Analysis Appendix 1 – Options appraisal of Energy Scenarios

Number	Attribute	Future Energy Scenario				Notes
		Consumer Transformation	System Transformation	Leading the Way	Steady Progression	
1	Speed of decarbonisation	7	7	10	0	Fastest rate of decarbonisation scores highest
2	Net Zero by 2050	9	9	10	0	Meeting the challenge with lowest risk of failure scores highest
3	Carbon intensity of electricity in 2050	10	10	8	0	Lowest electricity carbon intensity scores highest for impact on climate change
4	Demand for electricity in 2050	0	6	1	10	Lowest overall electricity demand scores highest for system stability and cost to manage
5	Demand for natural gas in 2050	9	3	10	0	Lowest overall gas demand scores highest for system stability and cost to manage
6	Peak electricity demand	0	7	9	10	Lowest peak electricity demand scores highest for system stability and cost to manage
7	Peak gas demand	9	5	10	0	Lowest peak gas demand scores highest for system stability and cost to manage
8	Degree of Interconnection	9	3	10	0	Highest interconnection scores highest as it offers U.K. options for balancing power and route to sell surplus electricity abroad
9	Reliance on imported electricity supplies	10	5	7	0	Lowest reliance scores highest
10	Reliance on imported gas supplies	1	0	10	6	Lowest reliance scores highest
11	Energy storage capacity	9	3	10	0	Highest storage capacity scores highest as this technology supports resilience and is particularly suited to deployment in West Sussex
12	Vehicle-to-Grid capacity	8	3	10	0	Highest Vehicle-to-Grid capacity scores highest as this technology supports resilience and is particularly suited to deployment in West Sussex
13	Government Policy support	9	3	10	0	Highest support for U.K. Government Targets (e.g. for deployment of technologies or policy interventions) scores highest
	Total	90	63	115	26	
	Preference	2	3	1	4	

Appendix 2 – Life in each scenario [Text provided by National Grid]

Consumer Transformation – The 2050 net zero target is met with measures that have a greater impact on consumers and is driven by greater levels of consumer engagement. A typical homeowner will use an electric heat pump with a low temperature heating system and an EV. They will have made extensive changes to improve their home's energy efficiency and most of their electricity demand will be smartly controlled to provide flexibility to the system. The system will have higher peak electricity demands managed with flexible technologies including energy storage, demand-side response and smart energy management.

System Transformation – The typical domestic consumer will experience less disruption than in Consumer Transformation as more of the significant changes in the energy system happen on the supply side, away from the consumer. A typical consumer will use a hydrogen boiler with a mostly unchanged heating system and an EV or a fuel cell vehicle. They will have had fewer energy efficiency improvements to their home and will be less likely to provide flexibility to the system. Total hydrogen demand is high, mostly produced from natural gas with carbon capture and storage.

Leading the Way – We assume that Great Britain decarbonises rapidly with high levels of investment in world-leading decarbonisation technologies. Our assumptions in different areas of decarbonisation are pushed to the earliest credible dates. Consumers are highly engaged in reducing and managing their own energy consumption. This scenario includes more energy efficiency improvements to drive down energy demand, with homes retrofitted with insulation such as triple glazing and external wall insulation, and a steep increase in smart energy services. Hydrogen is used to decarbonise some of the most challenging areas such as some industrial processes, produced mainly from electrolysis powered by renewable electricity, with no hydrogen production from natural gas.

Steady Progression – There is still progress on decarbonisation compared to the present day. However, it is slower than in the other scenarios. While home insulation improves, there is still heavy reliance on natural gas, particularly for domestic heating. Electric vehicle (EV) take-up grows more slowly, displacing petrol and diesel vehicles for domestic use; however, decarbonisation of other vehicles is slower with continued reliance on diesel for heavy goods vehicles. In 2050 this scenario still has significant annual carbon emissions, short of the 2050 net zero target.