Stafford
BOROUGH COUNCIL

Local Plan 2020-2040

Climate Change Topic Paper

(Preferred Options Stage)

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1. Policy Context

European

1.1 Whilst the UK is no longer part of the European Union (EU), EU legislation as it applied to the UK on the 31 December 2020 is now part of the UK domestic legislation, under the control of the UKs Parliaments and Assemblies. As such EU law still applies to the UK.

European Green Deal

1.2 The European Green Deal (https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en) sets out how the EU will become a modern, resource-efficient and competitive economy ensuring:

- No net emissions of greenhouse gases by 2050;
- Economic growth decoupled from resource use; and
- No person or place left behind.

1.3 The European Green Deal does not apply in the UK except to the extent that its provisions were incorporated into UK law before 31 December 2020. Under the withdrawal agreement the UK is committed to non-regression (i.e. not weakening commitments as the stood at 31 December 2020) and the withdrawal agreement also includes a mechanism for ensuring a continuing level playing field.

European Climate Law

1.4 European Climate Law (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119) writes into European law (but not UK domestic legislation as it post-dates 31 December 2020) the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The Climate Law sets out:

- a legal objective for the Union to reach climate neutrality by 2050;
- 2030 climate target of at least 55% reduction of net emissions of greenhouse gases as compared to 1990;
- a process for setting a 2040 climate target, taking into account an indicative greenhouse gas budget for 2030-2050 to be published by the Commission;
- a commitment to negative emissions after 2050;
- the establishment of European Scientific Advisory Board on Climate Change, that will provide independent scientific advice;
- stronger provisions on adaptation to climate change;
- strong coherence across Union policies with the climate neutrality objective; and

- a commitment to engage with sectors to prepare sector-specific roadmaps charting the path to climate neutrality in different areas of the economy.

National

Climate Change Act 2008

1.5 The Climate Change Act 2008 sets a legal framework for the UK to cut greenhouse gas emissions to 80% below 1990 levels by 2050. Outputs from this Act provide an evidence base which can be used in identifying priorities for action and appropriate adaptation measures.

The Ten Point Plan for green industrial revolution

1.6 To put us on the path of net zero by 2050, the Ten Point Plan (https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution) aims for at least a 68% reduction in greenhouse gas emissions by the end of the decade when compared to the 1990 levels. The 10 Point Plan sets out ten points to achieve this reduction:

1. Offshore wind: Producing enough offshore wind to power every home, quadrupling how much we produce to 40GW by 2030, supporting up to 60,000 jobs;
2. Hydrogen: Working with industry aiming to generate 5GW of low carbon hydrogen production capacity by 2030 for industry, transport, power and homes, and aiming to develop the first town heated entirely by hydrogen by the end of the decade;
3. Nuclear: Advancing nuclear as a clean energy source, across large scale nuclear and developing the next generation of small and advanced reactors, which could support 10,000 jobs;
4. Electric vehicles: Backing our world-leading car manufacturing bases including those in the West Midlands, North East and North Wales to accelerate the transition to electric vehicles, and transforming our national infrastructure to better support electric vehicles';
5. Public transport, cycling and walking: Making cycling and walking more attractive ways to travel and investing in zero-emission public transport for the future;
6. Jet Zero and greener maritime: Supporting difficult-to-decarbonise industries to become greener through research projects for zero-emission planes and ships;
7. Homes and public buildings: Making our homes, schools and hospitals greener, warmer and more energy efficient, whilst creating 50,000 jobs by 2030, and a target to install 600,000 heat pumps every year by 2028;

8. Carbon capture: Becoming a world-leader in technology to capture and store harmful emissions away from the atmosphere, with a target to remove 10MT of carbon dioxide by 2030, equivalent to all emissions of the industrial Humber today;
9. Nature: Protecting and restoring our natural environment, planting 30,000 hectares of trees every year, whilst creating and retaining thousands of jobs; and
10. Innovation and finance: Developing the cutting-edge technologies needed to reach these new energy ambitions and make the City of London the global centre of green finance.

Energy White Paper: Powering our net zero future

1.7 The Energy White Paper (https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future) sets out how the UK will clean up the energy system and reach net zero emissions by 2050. It builds upon the 10 Point Plan by setting out a strategy for the wider energy system that:

- Transforms energy;
- Supports a green recovery; and
- Creates a fair deal for consumers.

1.8 The paper sets out in more detail commitments on the above three objectives, the specific commitments related to the objective of transforming energy are:

- Targeting 40GW of offshore wind by 2030;
- Supporting the deployment of Carbon Capture, Usage and Storage (CCUS) in four industrial clusters;
- Establishing a new UK Emissions Trading System;
- Aiming to bring at least one large-scale nuclear project to the point of Final Investment Decision;
- Consulting on whether it is appropriate to end gas grid connections to new home being built from 2025;
- Growing the installation of electric heat pumps;
- Building world-leading digital infrastructure for our energy system

Net Zero Strategy: Build Back Greener

1.9 The Net Zero strategy (https://www.gov.uk/government/publications/net-zero-strategy) builds on the approach to keep the UK on track for carbon budgets, to meet the 2030 Nationally Determined Contribution, (a non-binding national plan highlighting climate change mitigation, including climate-related targets for greenhouse gas emission reductions), and be net zero by 2050. It includes:

- decarbonisation pathways to net zero by 2050, including illustrative scenarios;
- policies and proposals to reduce emissions for each sector; and
- cross-cutting action to support the transition

The Environment Act 2021

1.10 The Environment Act (https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted) requires the UK Government to set legally binding long-term environmental targets. These targets will help secure long-lasting improvement in the natural environment covering the following areas:

- Governance and the Office of Environmental Protection;
- Waste and Resource Efficiency: recycling;
- Waste and Resource Efficiency: litter and waste crime enforcement;
- Waste and Resource Efficiency: other measures;
- Air Quality;
- Water; and
- Nature and biodiversity.

Levelling Up and Regeneration Bill 2022

1.11 The Levelling Up White Paper (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1052708/Levelling_up_the_UK_white_paper.pdf) sets out how the Government will spread opportunity more equally across the UK. The paper has limited actions relating to climate change, although it does acknowledge that there is opportunity to adopt innovative local proposals to deliver action on climate change and the UK's Net Zero targets.

Planning and Compulsory Purchase Act 2004

1.12 Local planning authorities are bound by Section 19 of the Planning and Compulsory Purchase Act, amended by 2008 Planning Act, to ensure that the plan contributes to the mitigation of and adaptation to climate change. Section 19 of this Act is more powerful in decision-making than the status of the National Planning Policy Framework.

National Planning Policy Framework (NPPF) 2021

1.13 Whilst the NPPF (https://www.gov.uk/government/publications/national-planning-policy-framework--2) is guidance and not statute, it is an important document that supports tackling climate change. Specifically, paragraph 153 states that:

"plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of

overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure."

Future Homes Standard (2019 – present)

1.14 The government has undertaken a range of consultations related to the Future Homes Standard. The Future Homes Standard (FHS) is a set of standards that will complement building regulations to ensure that new homes built from 2025 will produce 75-80% less carbon emissions that homes delivered under the current 2013 building regulations. All dwellings built from 2025 will be constructed so that no further energy efficiency retrofit work will be required to enable them to become zero carbon.

1.15 The full Future Homes Standard is yet to be finalised and published. The first step of the standards was released in December 2021 and provided an update to the Part L: Conservation of fuel and power. This update results in domestic dwellings producing 30% less carbon emissions than those built under the 2013 regulations. The next steps for the Future Homes Standards and a move towards more sustainable buildings is:

- Technical specifications consulted upon in 2023;
- New legislation 2024; and
- Implementation from 2025.

Local

Stafford Borough Corporate Business Plan (2021-2024)

1.16 The three year plan (https://www.staffordbc.gov.uk/corporate-plan) sets out how the council will deliver and sustain economic growth, respect the environment, support communities and ensure that the borough is a great place to live, work and visit. Within this plan, Objective 3 is:

"To tackle climate change by implementing our Climate Change and Green Recovery objectives."

1.17 Within the next three years to meet this objective, the plan states that the council will:

- Reduce emissions from the councils own activities;
- Work in partnership with Government Elected Bodies, Elected Members, Public and Voluntary Sector Partners, Residents and Businesses across the borough to take action that contributes to carbon neutrality and sustainable development within communities across the natural environment;
- Mitigate and adapt to climate change; and

- Implement council green recovery objectives.

Stafford Borough Climate change and Green Recovery Strategy 2020-2040

1.18 This strategy (https://www.staffordbc.gov.uk/Climate-Change-and-Green-Recovery) sets out how the council aims to recover from the effects of the Covid-19 pandemic to achieve a more sustainable borough by protecting and enhancing the environment. The Strategy has the same four objectives as the Corporate Business Plan (2021-2024). Attached to this Strategy is a delivery plan which provides more details on the milestones that are to be delivered within a given time period, shown in Table 1.

Table 1: SBC Climate Change Delivery Plan

Objective	Action	Output
Reducing Emissions from Own Activities	Reduce emissions from our activities	The achievement of carbon neutrality from council own emissions by 2040 (as per the climate emergency declaration 2019)
Work in partnership with Government, Elected Bodies and Elected Members, Partners and Residents across the borough to take action that contributes to carbon neutrality and sustainable development within communities	Encourage Elected Members to work with their communities to raise awareness of and identify opportunities to implement sustainable low carbon initiatives and promote community action on reducing emissions	To work in partnership with elected members and staff to increase carbon literacy. To encourage local communities to transition to a low carbon lifestyle. To work with partner organisations and stakeholder groups to deliver climate action initiatives. To work with neighbouring authorities to share examples of best practice, and to ensure climate change is addressed across boundaries. The adoption of a collaborative approach to deliver climate action across the borough.
Mitigate and adapt to climate change	Refresh the Climate Change Adaptation Strategy	Publication of Adaptation Strategy Integration of climate change principles in the procurement process to timescale Identification of relevant campaigns to timescale Progress of Adaptation Strategy Deployment of climate change adaptation measures
Continue to implement our green recovery objectives	Follow the Lawton Principles of delivering more, bigger, better and connected habitats	Enhance existing habitats throughout the Borough. Seek opportunities to create new habitats. Ensure connectivity through a network of high-quality connected habitats throughout the Borough. Well managed Blue and Green infrastructure

2. Climate Change

2.1 The sixth assessment report (published April 2022) from the Intergovernmental Panel on Climate Change highlights how it is unequivocal that human influence has warmed the atmosphere, ocean and land. This has resulted in widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere.

2.2 Many changes in the climate system are in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, heavy precipitation, agricultural and ecological droughts in some regions, a higher proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost.

2.3 Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events. (https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Headline_Statements.pdf)

2.4 Whilst climate change is a global issue, it will affect different countries and regions in different ways.

National context

2.5 In the UK the frequency and intensity of extreme temperature and rainfall events is likely to increase in the future, with the extent of change depending on global efforts to reduce greenhouse gas emissions.

2.6 Within the UK the effects of climate change will differ between the north and the south. It is projected that by the year 2100, many areas in the north could exceed 30°C at least once per decade. Whereas in the south-east, temperatures above 35°C will become increasingly common, and temperatures exceeding 40°C also become more likely.

2.7 In July 2022, the UK went through the most intense and widespread heatwave ever recorded, with temperatures exceeding 40°C for the first time. A new daily maximum recorded of 40.3°C was reached on 19 July in Coningsbury, Lincolnshire, and a new highest minimum of 25.8°C was recorded overnight at Kenly Airfield, Greater London. Across the country many long-running stations which have 100+ years of records recorded their highest ever temperature, with some recording margins of 3 to 4°C. (https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2022/2022_03_july_heatwave.pdf)

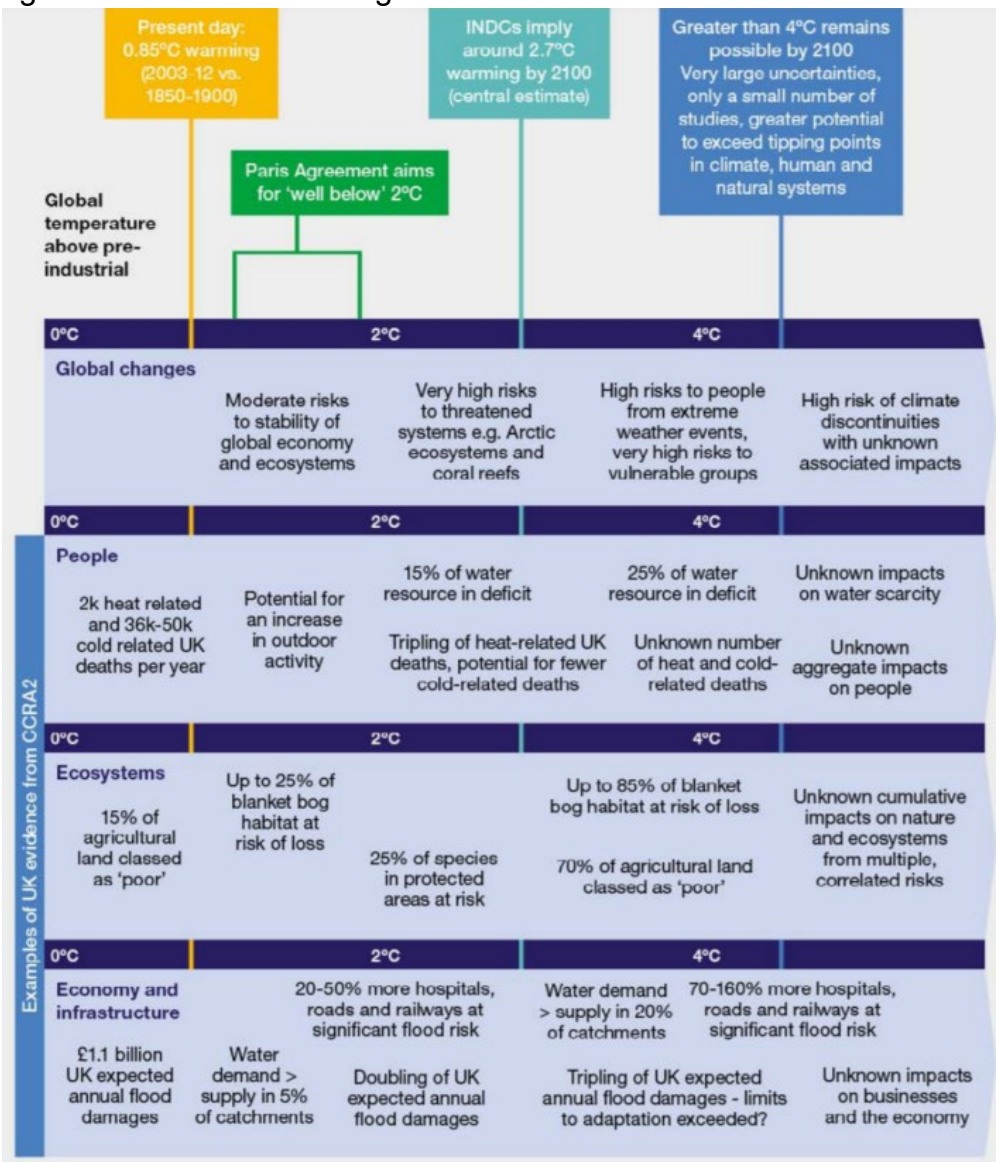
2.8 The extreme heat also resulted in wildfires occurring across the country. It has since been determined that without human-caused climate changes, temperatures exceeding 40°C in the UK would have been extremely unlikely, with it being calculated that human-caused climate changes made this event

at least 10 times more likely (https://www.worldweatherattribution.org/without-human-caused-climate-change-temperatures-of-40c-in-the-uk-would-have-been-extremely-unlikely/).

2.9 Currently, summers that experience days above 40°C somewhere in the UK have a return time of 100-300 years. However, in a high climate change scenario this could increase to once every 3.5 years by 2100 (https://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/2022/11/West-Midlands-Climate-Change-Risk-Assmt-Adaptation-Plan-2021-26-Final.pdf).

2.10 For the UK the impacts of increasing temperatures are illustrated in the figure below, taken from UK Climate Change Risk Assessment 2017 Evidence Report (www.theccc.org.uk/uk-climate-change-riskassessment-2017/synthesis-report/).

Figure 1: UK Climate Change Risks



Regional context

2.11 The West Midlands Climate Change Risk Assessment and Adaptation Plan 2021-2026 (https://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/2022/11/West-Midlands-Climate-Change-Risk-Assmt-Adaptation-Plan-2021-26-Final.pdf) sets out the risks and opportunities that climate change presents in the West Midlands. These are set out in Appendix 1.

2.12 The report provides projections for future climate scenarios in the West Midlands, as can be seen in Table 2, taken from the Metoffice (2021), UK Climate Projections. The values present an estimated average temperature and precipitation for the years 2050 and 2080, using a a 1981-2000 baseline. The table presents two different scenarios per year: RCP2.6 and RCP6.0, RCP2.6 is roughly equivalent to a global warming of +2°C above preindustrial scenario by the year 2100, and RCP6.0 is roughly equivalent to a global warming +4°C above preindustrial levels by the year 2100. It is important to note that because these projections show average central estimate changes in individual years would show a much greater range of change and could be significantly higher (or lower).

Table 2: West Midlands Climate Projections

Mean temperatures and precipitation	**2050s RCP 2.6 (50th percentile)**	**2050s RCP 6.0 (50th percentile)**	**2080s RCP 2.6 (50th percentile)**	**2080s RCP 6.0 (50th percentile)**
Mean Annual Temperature	+1.2°C	+1.2°C	+1.3°C	+2.4°C
Mean Winter Temperature	+1.1°C	+1.1°C	+1.2°C	+2.0°C
Mean Summer Temperature	+1.7°C	+1.5°C	+1.9°C	+3.2 °C
Mean Summer Precipitation	-15%	-15%	19%	-26%
Mean Winter Precipitation	+6%	+5%	+9%	+14%

Temperature

2.13 The annual temperature in the West Midlands is set to rise between approximately 1.2°C by the 2050s and between 1.3°C and 2.4°C by the 2080s.The rise will depend on the global response to tackling greenhouse gas emissions.

2.14 Summer temperatures are expected to rise by a slightly greater extent compared to winter temperatures, meaning that there is a greater risk of heatwave prevalence. The increase in temperature will likely result in an increase of seasonal deaths and the number of people suffering from morbidity (mentally and physically) due to extreme weather events.

2.15 Temperature increase will result in poorer air quality which in turn increases the frequency of cardiorespiratory diseases and allergies from changes in air quality.

Rainfall

2.16 Rainfall trends depend on the season, with more occurring in the winter and less in the summer. In winter, rainfall is expected to increase by approximately 6% by the 2050s and by between 9% to 14% by the 2080s from a 1981-2000 baseline whereas, summer rainfall is expected to decrease by approximately 15% by the 2050s and by between 19% to 26% by the 2080s. However, the degree of winter and summer rainfall changes will depend on global efforts to reduce greenhouse gas emissions.

2.17 The increase of rainfall will lead to an increase in the likelihood of flooding of infrastructure, businesses, and homes. However, periods of water scarcity are projected to become more prevalent under these scenarios, leading to possible implications for agriculture and industry.

Local context

2.18 To obtain localised information on the effects of climate change a study (www.staffordbc.gov.uk/staffs-final-report-rev-3-updates-2020) of the energy and sustainability policies for the Staffordshire area was undertaken by Staffordshire County Council and the eight constituent Local Authorities.

2.19 The report highlighted how Staffordshire is exposed to several climate related risks, particularly flooding, which climate change is likely to exacerbate. It is expected that because of the effects of climate change the area will result in warmer, wetter winters and hotter, drier summers, with an increase in the frequency and intensity of extreme events.

2.20 During the period 2010 – 2020 there have been 33 severe weather events in Staffordshire as follows:

Table 3: Extreme Weather Events (2010-2020)

Weather event	Occurrence
Flooding	12
Flooding (fluvial)	4
Severe Storm and Gales	5
Heatwave	8
Drought	1
Snow	2

2.21 These events are further expanded upon in Appendix K of the Climate Change Adaptation & Mitigation: Baseline Report.

2.22 The UK Climate Projections 2018 (UKCP18; https://www.metoffice.gov.uk/research/approach/collaboration/ukcp) provides projections for future climate scenarios and trends. Table 4 presents climate change projections for Stafford, showing the projected average weather conditions as an estimated mean temperature. It does not capture the full range of possible more frequent severe weather events e.g. prolonged rainfall. The data presented is based on the high emission scenario RCP8.5. This scenario is predicted with 3 different probability levels; a 50% probability level: 10% probability level and a 90% probability levels. The 10% and 90% probability levels are shown in the brackets to indicate the range of potential outcomes. The projections have been placed against the baseline climate data for Staffordshire, which represent an average derived from met office weather stations between 1981 – 2010. Each table represents a 25km grid of projection data applied across Staffordshire.

Table 4: Climate projections (UK Climate Impacts Programme)

Climate Variable	**Baseline (1981-2010)**	**Projected Change for Stafford (Celsius) in 2030**	**Projected Change for Stafford (Celsius) in 2050**	**Projected Change for Stafford (Celsius) in 2080**
Mean annual air temp anomaly at 1.5°C	9.5	+0.75 (+0.14 / +1.33)	+1.66 (+0.73 / +2.68)	+3.27 (+1.52 / +5.17)
Mean annual air temp anomaly at 1.5°C	13.2	+0.81 (+0.18 / +1.42)	+1.82 (+0.67 / +2.98)	+0.75 (+1.40 / +5.64)
Mean annual air temp anomaly at 1.5°C	5.8	+0.75 (+0.14 / +1.33)	+1.58 (+0.61 / +2.69)	+3.13 (+1.36 / +5.14)
Mean annual air temp anomaly (%) with Baseline rainfall (mm)	777.3	-0.19 (-5.24 / +5.22)	-0.92 (-6.86 / +4.96)	-0.91 (-4.35 / +6.20)

2.23 When investigating the effects of climate change if we investigate temperature under a high emission scenario and a 90% probabilistic level, we expect:

- The trend of rising annual temperatures is forecast to continue, with seasonal average warming by 2080 expected to rise by 5.4ºC in summer and 4.2ºC in winter.
- Extreme temperatures are set to rise, with the temperature of hot summer days to increase by up to 6.8ºC by 2080.

- Hot spells (temperatures above 30ºC for two or more consecutive days) are also set to continue to increase in frequency and duration, rising from an average of 0.25 per year in 2018 to 4.3 per year by 2080.

2.24 For precipitation under a high emission scenario and a 90% probabilistic level, we expect:

- There will be a greater seasonality of rainfall with more in winter and less in summer (when compared to baseline conditions). This is portrayed by a season average precipitation change by 2070 of between -47% and +2% in summer and -1% and +35% in winter which may lead to changes in water availability such as increased water shortages in summer.
- Rainfall events that currently occur typically once every 2 years will increase in frequency by 25%.

2.25 Within the Aecom Climate Change Adaptation and Mitigating study high risks were identified. A high risk means that it would directly impact areas across Staffordshire. These risks are shown in Table 5, information taken from UK Climate Change Risk Assessment published by the Climate Change Committee in 2017 (https://www.theccc.org.uk/uk-climate-change-risk-assessment-2017/ccra-chapters/).

Table 5: Risks identified as those with a 'High' Relevance to Staffordshire and the primary climate hazard

Risks as per UKCCRA with a 'High' Relevance to Staffordshire	**Primary Climate Hazard**
Risks of land management practices exacerbating flood risks	River flooding
Risks and opportunities from changes in landscape character	Cross-cutting
Risks of cascading failures from interdependent infrastructure networks	Cross-cutting
Risks to infrastructure services from river, surface water and groundwater flooding	River flooding
Risks of sewer flooding due to heavy rainfall Surface Water Flooding	Surface water flooding
Risks to bridges and pipelines from high river flows and bank erosion	River flooding
Risks to transport networks from slope and embankment failure	Severe storm and gales
Risks to public water supplies from drought and low river flows	Drought
Risks to energy, transport and digital infrastructure from high winds and lightning	Severe storm and gales

Risks as per UKCCRA with a 'High' Relevance to Staffordshire	Primary Climate Hazard
Risks to transport, digital and energy infrastructure from extreme heat	Heat wave
Potential benefits to water, transport, digital and energy infrastructure from reduced extreme cold events	Cold and Snow
Risks to health and wellbeing from high temperatures	Heat Wave
Opportunities for increased outdoor activities from higher temperatures	Heat Wave
Potential benefits to health and well-being from reduced cold	Heat Wave
Risks to people, communities and buildings from flooding	Surface Water Flooding
Risks to building fabric from moisture, wind and driving rain.	Severe Storm and Gales
Risks to health and social care delivery from extreme weather	Cross-Cutting
Risks to health from changes in air quality	Heat Wave
Risks to health from poor water quality	Drought
Risk of household water supply interruptions	Cross-Cutting

2.26 Of the risks identified, the largest number of risks are posed to infrastructure, people and the built environment.

2.27 The most frequent hazard experienced throughout Staffordshire is flooding (either fluvial or surface water). The extent of the impact experienced varies depending on the duration and scale of the event. Local areas prone to flooding are Sandon Road and Victoria Park.

2.28 On 8 occasions during the time-period 2010-2020 the temperature was 30°C or above within the county. Whilst the increase in warmer temperatures can be enjoyable, the increased temperature results in an increase in overheating which presents a detrimental risk to the most vulnerable population groups within society, such as the elderly and infirm.

Baseline Fuel Consumption

2.29 Stafford borough approximately consumed 3,851 Giga Watt Hours (GWh) of total fuel in 2018. This constitutes as 17.2% of all fuel consumption in the county of Staffordshire, which is the highest fuel consumption of a Local Authority within the county.

2.30 A breakdown of fuel consumption by sector and fuel type in 2018 is shown in Table 6. Data taken from Aecom (2020), Climate Change Adaptation & Mitigation: Baseline Report (www.staffordbc.gov.uk/baseline-report-rev-4-updates-2020).

Table 6: Fuel consumption by sector and fuel type in 2018

Sector	Industrial and Commercial (GWh)	Domestic (GWh)	Road transport (GWh)	Rail (GWh)	Other e.g. petroleum products used in the public and agricultural sectors (GWh)	Total (GWh)
Coal	7.1	11.9	-	-	0.8	19.7
Manufactured Fuels	1.1	7.4	-	-	-	8.5
Petroleum Products	103.0	83.9	1893.6	7.4	79.0	2,166.8
Gas	336.3	714.9	-	-	-	1,051.2
Electricity	350.1	221.6	-	-	-	571.7
Bioenergy and Waste	-	40.2	-	-	-	40.2
Total by sector	**797.6**	**1,079.8**	**1,893.6**	**7.4**	**79.8**	**3,858.1**

2.31 The road transport sector accounts for the highest proportion of fuel consumption in the borough at 49.1%, followed by domestic at 28% (of which approximately 66.2% of fuel consumed is gas and 20.5% is electricity). Industrial and commercial sectors have a fuel consumption of 20.7% (of which approximately 42.2% of fuel consumed is gas and 43.9% is electricity).

2.32 Stafford borough produces 1.1 million tonnes of CO2 through greenhouse gases (GHG) per year. Within the borough Greenhouse Gases (GHG) are c1.1 million tonnes CO_2 per annum. This is higher than the average for the county of Staffordshire and for the UK as a whole on a per capita basis. The largest source of these emissions is, petrol and diesel, mainly for road transport use. This could be due to the road links within the borough including the motorway, and may potentially be due to the rural nature of the borough and the reliance on personal car usage.

3. Issues and Opportunities

3.1 There are a variety of issues as a result of Climate Change on both a national and local scale. However, there are also a range of opportunities to help address these issues and mitigate the impacts.

Issues

3.2 The issues related to the climate emergency are of a global nature. As established earlier in this topic paper, there are areas where planning policy can influence the resilience to climate change including managing high temperatures, managing flood risk and managing water resource and water quality. The following issues are specifically relevant to the borough:

- Flooding vulnerability leading to damage of infrastructure;
- Storm damage;
- Heat island effect in highstreets;
- Widening health inequalities;
- Loss of biodiversity;
- Drought impacting on agricultural practices; and
- Changes to seasonality leading to food insecurity.

Opportunities

3.3 Proactive mitigation and adaptation measures can provide opportunities to address some of the issues caused by the climate emergency. These are:

- The creation of a new garden community within the borough at Meecebrook presents the opportunity to create a sustainable new community. This new development can be net zero;
- Sustainable development moving towards Low/Zero Carbon (LZC) technologies;
- District Heating systems developed within mixed use sites;
- Awareness of the importance of green and blue infrastructure; and
- Increased tourism season due to better weather.

4. Implications of Drivers for Change

4.1 As mentioned above the effects of climate change are on a global scale, however for the borough the main identified implications are:

- Reduction of land availability due to more land being subject to flooding;
- Existing properties becoming more prone to flooding;
- Heat island effect; and
- Reduction in agricultural output due to changes in crops, drought etc.
- Objective
- The supporting objective from the Preferred Options is:
- Contribute to Stafford Borough being net zero by ensuring that development mitigates and adapts to climate change and is future proof.

5. Issues and Options Consultation

5.1 Section 4 of the Issues and Options consultation demonstrated that whilst there was a general consensus for addressing the issues arising from climate change there was not a general consensus on how this should be achieved.

5.2 A key point from the consultation was whether Stafford Borough Council should expect standards in excess of current or future building regulations, e.g. standards relating to energy efficiency, water consumption etc. There was a very marked split on the questions relating to this issue. The preferred options policy does expect standards in excess of current or future building regulations, as there is a need to proactively address climate change.

5.3 The preferred options policy approach addresses some specific issues raised within the consultation. Specifically, that renewable energy schemes should be considered onsite where possible.

6. Policy

6.1 Under the Climate Change Act 2008 and the Planning Act 2008, there is a legal obligation to make climate mitigation and adaptation a central principle of plan-making. Specifically, development plans must include “polices designed to secure that the development and use of land in the local planning authority’s area contribute to the mitigation of, and adaptation to climate change.” (Section 19 (1A) of the Planning and Compulsory Act 2004).

6.2 The need to mitigate against, and to adapt to, the effects of the climate emergency is recognised by the council, as demonstrated by its climate emergency declaration in July 2019.

6.3 As this topic paper sets out, there is a need and a local desire for climate change mitigation and adaption policies to be central to the emerging new Local Plan. A proactive approach to mitigating and adapting to climate change therefore underpins the vision, objectives and Preferred Options policy.

POLICY 4: Climate change development requirements

A. Proposals must demonstrate that all resources are used efficiently, as part of the construction and operation of a building. All major development should set out how embodied emissions have been taken into consideration through the production of an embodied carbon assessment.

Net zero operational energy: residential

B. In order to demonstrate net zero carbon operational energy, all new dwellings must demonstrate through an energy statement, that the following have been achieved:

    1. No on-site fossil fuel combustion;

2. Energy use is minimised, demonstrated through space heating demand of less than 15kWh/m^2/year and operational energy use of less than 35kWh/m^2/year; and

3. On-site renewable generation is maximised, equivalent to at least the on-site energy demand.

Alternatively, compliance can be demonstrated through Passivhaus Standard accreditation, using the Passivhaus Planning Package.

Net zero operational energy: non residential

C. In order to demonstrate net zero carbon operational energy, all new major non-residential development must demonstrate through an energy statement, that the following have been achieved:

1. No on-site fossil fuel combustion;

2. Energy use is minimised appropriate to the end use;

3. On-site renewable energy generation is maximised, equivalent to the on-site energy demand; and

Alternatively, compliance can be demonstrated by using BREEAM Excellent level accreditation, with outstanding level for energy use (Credit Ene01) or through an alternative compliance route with prior agreement.

D. Residual energy demand for new residential and non-residential buildings should be met through onsite renewable energy schemes, but if this is not technically feasible, the requirement may be met elsewhere by means of offsite renewable energy generation. Where this is the case, the development proposal must demonstrate how additional renewable energy generation is procured to make up the on-site shortfall in generation. The offset mechanism will require agreement with the council.

Other requirements

E. Development must also:

1. Incorporate water efficient features and equipment into all new residential development to achieve a maximum water usage of 110 litres per person per day;

2. Follow the principles of the energy hierarchy; and

3. Demonstrate through the energy statement and/or design and access statement (where applicable) that opportunities to incorporate sustainable design features where feasible (such as rainwater harvesting and greywater recycling, green roofs, maximising use of recycled materials, orientating buildings to optimise solar gain) have been maximised.

Appendix 1: West Midlands Climate Change Risk Assessment

The following tables have been taken from the West Midlands Climate Change Risk Assessment and Adaptation Plan 2021-2026 (https://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/2022/11/West-Midlands-Climate-Change-Risk-Assmt-Adaptation-Plan-2021-26-Final.pdf).

Table A: A breakdown of the category types and what this means in terms of action.

Category Description	**More action needed**
More action needed	New, stronger or different Government action, whether policies, implementation activities or enabling environment for adaptation, over and above those already planned, are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will include different responses according to the nature of the risks and the type of adaptation: • Addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity). • Integrating climate change in near-term decisions with a long life-time or lock-in. • Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.
Further investigation	On the basis of available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action.
Sustain current action	Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk or opportunity continues to be managed in the future.
Watching brief	The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.

Table B: The risk or opportunities, type and urgency score for natural environment and assets

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Terrestrial species and habitats	Changing climatic conditions and extreme events, including temperature change, water scarcity, flooding, wind, and altered hydrology (including water scarcity and flooding)	More action needed
Risk	Terrestrial species and habitats	Pests, pathogens and invasive species as a result of climatic changes	More action needed
Risk	Terrestrial species and habitats	Wildfires causing destruction to habitats, lowlands, upland peatlands and carbon stores	Further investigation
Risk	Soils	Changing climatic conditions, including seasonal aridity and wetness	More action needed
Risk	Agriculture	Pests, pathogens and invasive species as a result of climatic changes	More action needed
Risk	Forestry	Pests, pathogens and invasive species as a result of climatic changes	More action needed
Risk	Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	More action needed
Risk	Freshwater species and habitats	Pests, pathogens and invasive species as a result of climatic changes	More action needed
Risk and Opportunity	Estuarine species and habitats	More frequent estuarine flooding, changes in salinity and impacts on species migration	Further investigation
Risk and Opportunity	Natural carbon stores, carbon sequestration and greenhouse gas (GHG) emissions	Changing climatic conditions, including temperature change and water scarcity causing destruction and release of locked-in carbon	More action needed

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk and Opportunity	Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, wind)	More action needed
Risk and Opportunity	Landscape character	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, wind)	Further investigation
Opportunity	Terrestrial species and habitats	New species colonisations as a result of climatic changes	Further investigation
Opportunity	Agricultural and forestry productivity	New/alternative species becoming suitable as a result of climatic changes	Further investigation
Opportunity	Freshwater species and habitats	New species colonisations as a result of climatic changes	Sustain current action

Table C: The risk or opportunities, type and urgency score for infrastructure

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Infrastructure networks (water, energy, transport, ICT)	Cascading failure of the infrastructure network; failure of one system leading to multiple failures in others as a result of more extreme weather	More action needed
Risk	Infrastructure networks and services	More frequent and extensive river, surface water and groundwater flooding	More action needed
Risk	Transport networks	Greater incidence of slope and embankment failure as a result of climatic changes	More action needed
Risk	Transport	Greater incidence of high and low temperature extremes, high winds and lightning as a result of climatic changes	More action needed
Risk	Bridges and pipelines	More frequent flooding and severe erosion	Further investigation
Risk	Energy	Greater incidence of high and low temperature extremes, high winds and lightning as a result of climatic changes	Further investigation

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Hydroelectric generation	More frequent and extreme low or high river flows as a result of climatic changes	Further investigation
Risk	Energy generation	Reduced water availability for generation plants as a result of climatic changes	Further investigation
Risk	Public water supplies	Reduced water availability as a result of climatic changes	More action needed
Risk	Subterranean and surface infrastructure (cables, pipes etc.)	Greater incidence of subsidence as a result of climatic changes	Further investigation
Risk	Digital infrastructure, telecoms and ICT	Greater incidence of high and low temperature extremes, high winds and lightning as a result of climatic changes	Further investigation

Table D: The risk or opportunities, type and urgency score for health, communities and the built environment

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Health and wellbeing	Greater incidence of high temperatures resulting in heat related health problems	More action needed
Risk	Health and wellbeing	Widening health inequalities as a result of greater climate disadvantage due to more extreme weather	Further investigation
Risk	Health and wellbeing	Changes in indoor and outdoor air quality driven by climate changes	Further investigation
Risk	Health	Greater incidence of vector-borne disease as a result of climatic changes	More action needed
Risk	Health	Poor water quality and household water supply interruptions as a result of climatic changes	Further investigation
Risk	Food safety and food security	Higher temperatures (affecting food safety) and extreme weather (affecting food security) as a result of climatic changes	Further investigation

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	People, communities and buildings	Greater frequency and extent of flooding as a result of climatic changes	More action needed
Risk	Health and social care delivery	Greater incidence of extreme weather affecting service delivery	More action needed
Risk	Education and prison services	Greater incidence of extreme weather affecting service delivery and building function	More action needed
Risk	Building fabric	Potential damage caused by moisture, wind and driving rain	Further investigation
Risk	Cultural heritage	Negative impacts due to changes in temperature, precipitation, groundwater, landscape change	More action needed
Risk and Opportunity	Household energy demand	Summer and winter temperature changes potentially reducing heating need but increasing cooling need	More action needed
Opportunity	Health and wellbeing	Drier, warmer summers leading to more opportunities to use outdoor spaces	Further investigation

Table E: The risk or opportunities, type and urgency score for business and industry

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Flooding of business sites	More frequent and extensive river, surface water and groundwater flooding	More action needed
Risk	Flooding of business sites	More frequent and extensive river, surface water and groundwater flooding leading to a greater water pollution risk	Further investigation
Risk	Business production processes	Water scarcity as a result of climatic changes	Further investigation
Risk	Business access to finance, investment and insurance	Greater incidence of extreme weather leading to disruption	Sustain current action

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Disruption to business supply chains and distribution networks	Greater incidence of extreme weather in the UK and abroad leading to disruption	More action needed
Risk	Reduced employee productivity in businesses	Greater incidence of infrastructure disruption as a result of climatic changes and higher temperatures in working environments	Further investigation
Opportunity	Changes in demand for goods and services	Long term climate change effects	Further investigation

Table F: The risk or opportunities, type and urgency score for international dimensions

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risk	Food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity and ocean changes globally	More action needed
Risk	The UK's international interests and responsibilities	International violent conflict resulting from climate change overseas	More action needed
Risk	Changes to international governance affecting the UK	Reduced international collective governance due to climate change and responses to it	More action needed
Risk	International trade routes	Climate hazards affecting supply chains	More action needed
Risk	Economic loss to the UK	Climate driven resource governance pressures and financial exposure	Sustain current action
Risk	UK public health	Increase in vector borne diseases due to climate change	More action needed
Risk	Risk multiplication to the UK	Interactions and cascades of climate risks across systems and geographies	More action needed

Risk or Opportunity	Receptor	Nature of risk / opportunity	Urgency score
Risks and Opportunity	Risk multiplication to the UK	Climate-related international human mobility	Watching brief
Opportunity	UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas as a result of climatic changes	Watching brief
Opportunity	Increased trade for the UK	Arctic ice melt opening up new trading routes as a result of climatic changes	Watching brief