South Gloucestershire Council Climate Emergency Declaration

South Gloucestershire Council Climate Emergency Strategy

Review of Year Three of the Climate Emergency Action Plan

South Gloucestershire Council Climate Emergency

University Advisory Group

UWE Bristol

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This review was commissioned by and prepared for South Gloucestershire Council.

For any queries or correspondence regarding the report, please contact the UWE Project Manager

Professor JWS Longhurst

University of the West of England, Bristol

Frenchay Campus

Coldharbour Lane

Bristol

BS16 1QY

E-mail: James.Longhurst@uwe.ac.uk

Tel: (+) 44 (0)117 3283692

For any queries or correspondence regarding Contract or Intellectual Property issues relating to this review, please contact the following:

Head of Contracts

Contracts and Legal Team

Commercial Services

University of the West of England, Bristol

Frenchay Campus

Coldharbour Lane

Bristol

BS16 1QY

Tel: (+44) (0)117 3282125

E-mail: Amy.Charles@uwe.ac.uk

South Gloucestershire Council

Review of Year 3 of the Climate Emergency Action Plan.

Introduction

The University of the West of England supports South Gloucestershire Council in their Climate Emergency work through a University Advisory Group. This group meets monthly with representatives of South Gloucestershire Council's Climate Emergency Team to review, support and critique the Climate Emergency activities.

Specifically, the University Advisory Group has

- Supported South Gloucestershire Council in the design and implementation of the Year 3 Climate Emergency Action Plan covering 2022/23.
- Provided advice and support for the Local Strategic Partnership's climate emergency activity in 2022.
- Provided a technical review of the outcomes of the Year 2 Action Plan.
- Advised on the key issues to include in the Year 4 Action Plan.
- Provided a critical review of the actions needed for the Council and the South Gloucestershire area to meet the Climate Emergency ambitions, Plan 2030.

This review has considered the Year 3 actions using the detailed Year 3 spreadsheet tracker produced by the Council (South Gloucestershire Council, 2022). This review also provides recommendations for actions and priorities for the Year 4 Action Plan covering 2023/24.

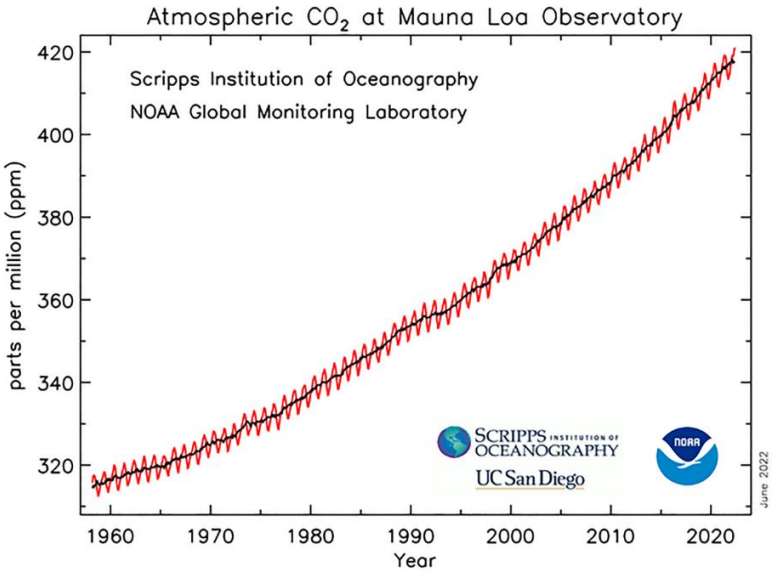
This review is undertaken at a time the UK is facing political and economic uncertainty, a cost of living crisis and energy supply and affordability challenges. South Gloucestershire is not immune to these challenges and the Council itself faces considerable budget shortfalls across the short and medium term.

The review comprises of a short overview of the global and national contexts before considering the changing profile of carbon dioxide emissions across South Gloucestershire. The next section provides a review and commentary on the Year 3 Action Plan outcomes. This is followed by a review of the actions taken in response to the recommendations identified in the review of Years 1 and 2 and those contained in Plan 2030. An updated strategic context covering political, environmental, social, technical, legal and economic issues (PESTLE) is included which is followed by the conclusions and recommended actions.

The Global Context

As COP 27 commences the concentration of carbon dioxide, CO_2, in the atmosphere measured at the US National Oceanic and Atmospheric Administration's Mauna Loa Atmospheric Baseline Observatory exceeded 420 parts per million, more than 50% above pre-industrial levels and an increase of 1.8 parts per million over 2021. Carbon dioxide levels are now comparable to the Pliocene epoch, over 4 million years ago. The global average temperature had warmed by nearly 1.2 degrees Celsius when compared to the pre-industrial value.

Figure 1



Source: https://www.noaa.gov/news-release/carbon-dioxide-now-more-than-50-higher-than-pre-industrial-levels?fbclid=IwAR3_PAk4AmI4czOO5ikK_CAGca94LMwQwIEfG9lo3ZWi72BeR6KaX05hHSw

Despite our increasing knowledge and ever more urgent warnings about the damage caused by climate warming gases the nations of the world have released more CO_2 in the last 30 years than in all of the decades from the start of the industrial revolution until 1990.

Without further and rapid action the world faces a rise in temperature of between 2.7 and 3 degrees centigrade, or even higher, by the end of the century. In 2018 the Intergovernmental Panel on Climate Change report called for action by 2030 to contain global heating to only 1.5 degrees centigrade. At that time we had 12 years to meet that goal, from 2023 we will have just 7.

South Gloucestershire's Climate Emergency declaration recognised the timescale set by the IPCC. An optimistic assessment of commitments made at COP26 suggests that these may be sufficient to hold the global temperature increase to just under 2 degrees Celsius. However, these commitments must be realised for this to happen. Under the Paris Agreement of 2015, countries committed to develop national plans setting out how much they would reduce their emissions to restrain warming to less than 2 and ideally 1.5 degrees Celsius. These plans are known as Nationally Determined Contributions, or 'NDCs'. At COP27, in November 2022, nations will present their updated plans for reducing emissions and review progress on reaching net zero by 2050. In addition, nations are also

required to produce a reduction targets for 2030. To keep warming to just 1.5 degrees Celsius means phasing out fossil fuel use as quickly as possible, accelerating the switch to renewables, protecting forests and other natural carbon sinks and incentivising a rapid switch to active travel, public transport and electric vehicles.

In October 2022 the UN published its Emissions Gap report for 2022 which found that there is *"no credible pathway to 1.5C in place*" and that "*woefully inadequate" progress on cutting carbon emissions means the only way to limit the worst impacts of the climate crisis is a "rapid transformation of societies*" (https://www.unep.org/resources/emissions-gap-report-2022).

Current pledges for action by 2030, even if delivered in full, would mean a rise in global heating of about 2.5 degrees Celsius, a level that would condemn the world to catastrophic climate breakdown (https://news.un.org/en/story/2022/10/1129912) .

To have any hope of restraining the rise in temperature requires a very rapid and sustained reduction in global emissions. Some 80% of global emissions come from the G20 group of nations and the same group are responsible for a very large share of the historic emissions. The developed countries at COP 27 need to agree the mechanisms that will mobilise the promised $100bn in climate finance per year for low and middle income countries and to incentivise the private sector to mobilise further resources. These financial resources will be desperately needed by countries affected by climate change who will need to build defences, restore and protect ecosystems, protect agricultural land and install warning systems to protect lives and homes.

The Emissions Gap report (https://www.unep.org/resources/emissions-gap-report-2022) and the United in Science report (https://public.wmo.int/en/resources/united_in_science) present sobering analyses of the challenge and reinforces the need for mitigation and adaptation at pace.

- **Levels of atmospheric carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O)** continue to rise. The temporary reduction in CO_2 emissions in 2020 during the pandemic had little impact on the growth of atmospheric concentrations (what remains in the atmosphere after CO_2 is absorbed by the ocean and biosphere).
- **Global fossil CO_2 emissions in 2021** returned to the pre-pandemic levels of 2019 after falling by 5.4% in 2020 due to widespread lockdowns. Preliminary data shows that global CO_2 emissions in 2022 (January to May) are 1.2% above the levels recorded during the same period in 2019, driven by increases in the United States, India and most European countries.
- **The most recent seven years, 2015 to 2021, were the warmest on record**. The 2018–2022 global mean temperature average (based on data up to May or June 2022) is estimated to be 1.17 (± 0.13 degrees Celsius) above the 1850–1900 average, making it the fourth warmest 5-year period on record after 2016–2020, 2015–2019, and 2017–2021
- **Around 90% of the accumulated heat in the Earth system is stored in the ocean**, the Ocean Heat Content for 2018–2022 was higher than in any other five-year period, with ocean warming rates showing a particularly strong increase in the past two decades.
- **Average sea-ice extent in the Arctic from 2018–2022 was below the 1981–2010 long-term average** and the Antarctic reached its lowest or second lowest minimum sea-ice extent on record (according to different data sources).
- **New national mitigation pledges for 2030 show some progress toward lowering greenhouse gas emissions, but are insufficient.** The ambition of these new pledges would need to be four times higher to get on track to limit warming to 2 degrees Celsius and seven times higher to get on track to 1.5 degrees Celsius.
- **The number of weather, climate and water-related disasters has increased by a factor of five over the past 50 years,** causing, on average, US$ 202 million in losses daily

- **Extreme weather events cause long-lasting socioeconomic impacts,** especially in the most vulnerable communities, which are often the least equipped to respond, recover and adapt
- **In 2022, human-caused climate change further contributed to significant economic and human losses associated with heavy rainfall and extreme heat events around the globe.**

The world is already seeing the impacts of a greater than 1 degree Celsius temperature increase. Extreme weather events such as heatwaves, droughts, flooding, winter storms, hurricanes and wildfires have increased in frequency and magnitude. These events will become more frequent even if global warming is restrained to 1.5 or 2 degrees Celsius. It will be much, much worse if average temperatures increased beyond these values.

The National Context

Urgent action is needed to meet the UK commitment to achieve the net zero by 2050. The UK's Net Zero Strategy sets out the strategic pathway to a net zero UK by 2050 (https://www.gov.uk/government/publications/net-zero-strategy) In the summer of 2022 the High Court found that the government's Net Zero Strategy was 'unlawful' because it does not meet the obligations under the Climate Change Act to produce detailed climate policies that show how the UK's legally-binding carbon budgets will actually be met. The UK government now has to update the strategy to include a quantified account of how its policies will actually achieve climate targets. These will have to be based on a realistic assessment of what it actually expects them to deliver. The Climate Change Committee has indicated that the current strategy may only have credible policies to achieve about 40% of the required emission reductions.

However, there has been good progress, UK emissions are now almost half (47%) their 1990 levels but emissions rose 4% in 2021 as the economy began to recover from COVID-19 but were still 10% below 2019 levels.

In its first comprehensive appraisal of UK's Net Zero Strategy, the CCC warns that:

"*The current strategy will not deliver Net Zero. Credible Government plans exist for over a third of the UK's required emissions reductions to meet the Sixth Carbon Budget in the mid-2030s; with a fair wind we will manage another quarter; and over a third cannot be relied on to deliver the necessary emissions reductions."* (https://www.theccc.org.uk/2022/06/29/current-programmes-will-not-deliver-net-zero/, https://www.theccc.org.uk/publication/sixth-carbon-budget/).

The Climate Change Committee's 2022 report to parliament makes over 300 recommendations for developing and implementing policies over the next year, reflecting the scale of the task as the Government moves from strategy to implementation. The Committee singles out energy efficiency in homes as one of the areas where policy drivers and evidence of implementation are weakest (https://www.theccc.org.uk/publication/2022-progress-report-to-parliament/).

South Gloucestershire Area Emissions

The most recent UK government data for local authority carbon dioxide emissions covers the year 2020 (https://www.data.gov.uk/dataset/723c243d-2f1a-4d27-8b61-cdb93e5b10ff/uk-local-authority-and-regional-greenhouse-gas-emissions). These data only covers territorial emissions from within South Gloucestershire and thus ignores wider supply chain and consumption based emissions. In this report South Gloucestershire emissions, within the scope of local authority control, are estimated at 1161.7303 kt for 2020 (BEIS full dataset (the council uses the sub-set data which estimates 1068.2 kt for 2020). The emission per capita is approximately 4 tonnes in 2020. In addition, a further 378.265kt are emitted from activities in the South Gloucestershire area but are considered outside of local authority control. These include emissions from motorways, diesel railways and land use, land use changes and forestry.

Plan 2030 (University of the West of England University Advisory Group, 2022) estimated that South Gloucestershire as an area will, on current estimates, have a residual CO_2 emission of some 5-600 kt in 2030, approximately half of the 2020 current emission. The vast majority of this residual comes from territorial emissions from industry, transport and the domestic sector. This was calculated assuming that the national actions set out in the UK Net Zero Strategy achieve the intended 78% reduction by 2035. This is a major assumption. In the absence of any further local action to reduce territorial emissions over and above national actions South Gloucestershire will need to determine how this residual could be managed through compensation actions such as offsetting. Land will need to be acquired and long-term funding for the ongoing management of the offset secured. Alternatively, enhanced local action can seek to mitigate this residual and thus work towards achieving the 2030 net zero goal for the area of South Gloucestershire.

The largest source of emissions within the scope of local authority control are from the domestic sector, followed by transport and local industry. The commercial sector, public sector and agriculture are smaller sources of emission. Land use is a modest carbon sink.

Gas emissions are the most important source in the domestic sector, followed by electricity. In the commercial sector emissions from electricity use are the largest source whilst industrial emissions are broadly similar from electricity and gas use. In the public sector gas use accounts for a larger share of CO_2 emissions than electricity. The carbon intensity of electricity supplied by the national grid is rapidly decarbonising and may achieve zero in the early to mid-2030s. In the transport sector emissions from traffic on minor roads are substantially greater than those from A roads.

Table 1. Area Emissions 2020

Year	Sector	Sub sector		Emission kt
2020	Agriculture	Agriculture Electricity	CO_2	2.426775
2020	Agriculture	Agriculture Gas	CO_2	0.328145
2020	Agriculture	Agriculture 'Other'	CO_2	14.61462
Sector total				**17.36954**
2020	Commercial	Commercial Electricity	CO_2	62.12596
2020	Commercial	Commercial Gas	CO_2	30.75385
2020	Commercial	Commercial 'Other'	CO_2	0.618824
Sector total				**93.49864**
2020	Domestic	Domestic Electricity	CO_2	87.7307
2020	Domestic	Domestic Gas	CO_2	223.9945
2020	Domestic	Domestic 'Other'	CO_2	28.07559
Sector total				**433.2995**
2020	Industry	Industry Electricity	CO_2	39.94097
2020	Industry	Industry Gas	CO_2	40.53792
2020	Industry	Industry 'Other'	CO_2	146.5967
Sector total				**227.07**
2020	Public Sector	Public Sector Electricity	CO_2	16.30131
2020	Public Sector	Public Sector Gas	CO_2	20.57531
2020	Public Sector	Public Sector 'Other'	CO_2	0.560895
Sector total				**37.43752**
2020	Transport	Road Transport (A roads)	CO_2	128.8592
2020	Transport	Road Transport (Minor roads)	CO_2	220.1777
2020	Transport	Transport 'Other'	CO_2	4.053117
Sector total				**353.0551**
Grand total				**1161.7303**

Source: Extracted from [UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2020]

Council Direct Emissions

Direct missions from the Council estate, which includes corporate buildings, schools, business travel, street lighting and fleet movements, equalled just over 9000 tonnes of CO_2e. This is less than 1% of the area wide emissions. The Council has set a target of a 10% reduction per year for its own emissions. In 2020/21 it achieved a reduction of just under 9% and in 2021/22 a reduction of 5.5%. In order to compensate for these below target outturns future emission reductions will need to exceed the 10% target.

South Gloucestershire Council Climate Emergency

South Gloucestershire Council declared a Climate Emergency on 17th July 2019. As part of this declaration, the Council pledged to provide the leadership to enable South Gloucestershire to become carbon neutral by 2030 (https://beta.southglos.gov.uk/wp-content/uploads/Climate-Emergency-Declaration.pdf).

The South Gloucestershire Climate Change Strategy contains commitments made by the council as part of the Climate Emergency declaration and subsequent climate emergency action plan(s). The overarching vision is: *For a climate resilient South Gloucestershire with a thriving low carbon economy and lifestyle reflected in our travel, homes, businesses, and communities, where nature can flourish.* To deliver the commitments made in the Climate Emergency declaration, the aims set out in the strategy document are:

I. For South Gloucestershire to become carbon neutral by 2030,

II. To maximise the generation of renewable energy from installations located within South Gloucestershire,

III. For South Gloucestershire to be prepared for the local impacts of the Climate Emergency,

IV. For nature in our local area to be more protected, connected, and healthy and biodiversity increased,

V. To plant trees across South Gloucestershire by 2030 to double tree cover.

(https://beta.southglos.gov.uk/wp-content/uploads/Climate-Emergency-Strategy.pdf)

As part of the declaration, the council produces a yearly climate emergency action plan and reports on progress towards the delivery of the plan in December of each year.

The Year 3 Action Plan for the period 2021/22 was approved by Cabinet in December 2021 and this report forms the independent review of progress on the delivery of that action plan. (https://council.southglos.gov.uk/documents/s130493/Appendix%203%20Climate%20Emergency%20Action%20Plan%20Year%203.pdf)

How then is the Climate Emergency Action Plan Addressing the Required Actions?

The detailed 16 page Action Plan progress tracker report provides a portfolio of projects collectively moving South Gloucestershire towards a net zero 2030 future.

The year 3 portfolio contains 79 active projects and the portfolio tracker is structured under the following headings

- Project Description
- Purpose
- Project Stage
- Budget
- Project Manager
- Responsible Body
- Unique Project Number
- Project History
- Project brief
- SMART targets identified
- Progress towards SMART target
- Inequalities reduced through project delivery
- Issues log
- RAG key

Project stages are defined as:

- **Prepare**. Project planning, this can include data gathering, research and consultation, business case development.

- **Develop**. Project development, this includes putting in place processes and systems, setting up governance structures, securing resources.

- **Implement**. Project delivery, outputs produced, putting in place measures or carrying out actions that deliver the aims.

Each project has its status categorised using a four point BRAG scale.

1. Blue. Complete or business as usual
2. Green. On track, no concerns
3. Amber. Minor slippage, some concerns;
4. Red. No progress, major concerns

As of 31/10/22 the active project portfolio comprises of

- 4 Blue
- 50 Green
- 23 Amber
- 2 Red

Actions are categorised according to 7 broad themes

- Cross Cutting
- Buildings/Built Development
- Transport (& Infrastructure / Highways)
- Renewable Energy
- Green Infrastructure and Nature Recovery
- Resources and Waste
- Adaptation and Resilience.

The project history tab records 7 new projects commencing in 2021/22: 2 of these are Cross Cutting, 3 are Transport and 2 are Renewable Energy projects. All of the other projects in the Portfolio are a continuation of year 1 or year 2 projects.

Projects are classified by purpose as follows:

- Reducing emissions
- Adaptation
- Nature

Many of the projects support more than one purpose.

The number of projects varies between each theme. The state of project development differs between and within themes as does the RAG status

Table 2. Theme Actions by RAG Status

Theme	Portfolio Total	Blue	Green	Amber	Red
Cross Cutting,	19	1	14	4	0
Buildings/Built Development	12	2	7	3	0
Transport (& infrastructure /Highways)	14	1	9	4	0
Renewable Energy	6	0	4	1	1
Green Infrastructure and Nature Recovery,	17	0	11	5	1
Resources and Waste	2	0	1	1	0
Adaptation and Resilience	9	0	4	5	0
Portfolio Total	**79**	**4**	**50**	**23**	**2**

Table 3. Theme Actions by Stage of Project

Theme	Prepare	Develop	Implement
Cross Cutting,	0	6	13
Buildings/Built Development	0	8	4
Transport (& infrastructure /Highways)	0	5	9
Renewable Energy	0	4	2
Green Infrastructure and Nature Recovery,	0	3	14
Resources and Waste	0	0	2
Adaptation and Resilience	0	3	6
Totals	**0**	**29**	**50**

Table 4. Theme Actions by Focus of Action

Theme	Reducing Emissions	Adaptation	Nature	Two Themes	All Themes
Cross Cutting,	7	0	0	4	8
Buildings/Built Development	6	0	0	2	4
Transport (& infrastructure /Highways)	12	0	0	1	1
Renewable Energy	6	0	0	0	0
Green Infrastructure and Nature Recovery,	0	0	9	8	0
Resources and Waste	1	0	0	1	0
Adaptation and Resilience	0	8	0	1	0
Totals	**32**	**8**	**9**	**17**	**13**

Challenges for South Gloucestershire Council

Achieving net zero across the area by 2030 requires mitigating some 1.1 million tonnes of CO_2 in the next 7 years.

Addressing the importance of gas in the domestic sector as an emission source.

Building climate resilience in the face of the changes already locked into the climate system by virtue of historic emissions of climatically active gases.

Enhancing the rate of nature recovery across the area.

This to be achieved at a time when the authority is facing substantial financial pressures.

Commentary on the Year 3 Action Plan

At the end of Year 3 the Council's Climate Emergency Action Plan contains a detailed portfolio of 79 projects. It is important to note that the entire portfolio now comprises of projects that are either in development or implemented. Equally important to note is the assessment of progress with the projects with 50 out of 79 projects coded Green in the BRAG assessment. These observations illustrate the significant progress that the Council have made over the three years of Climate Action Plans and is also reflected in the external assessment of the Council's work by Climate Emergency UK (https://councilclimatescorecards.uk/) who assessed South Gloucestershire's Climate Action as one of the best in the UK and the best in the West of England Combined Authority area. See also https://sites.southglos.gov.uk/newsroom/environment/south-gloucestershire-recognised-among-top-10-councils-in-national-climate-emergency-action-plan-scorecards/

Some projects in the portfolio do not have an assigned budget. It isn't clear whether or not the assigned budget is sufficient for the magnitude of the task.

Not all of the projects have a project brief. However, the project description and the SMART target commentary together provide an appropriate review of status and progress of each project. The level of detail associated with each project varies, perhaps indicating a more important project when extended details are provided. In other cases the brevity of detail provided might indicate an immature project or a less impactful one.

There are two red project in the portfolio as of 31/10/22. One is a renewable energy project and one a green infrastructure project.

Fifty projects listed in the Action Plan are identified as Green in the BRAG assessment and thus are progressing satisfactorily without concerns. However, commentary could be added to identify whether or not the rate of progress is sufficient for the identified project to make its intended contribution to the net zero and nature recovery goals.

Twenty three of the projects in the Action Plan are coded Amber in the BRAG assessment and thus are considered to be off track. The nature of the delay is described in sufficient detail in the vast majority of cases.

Amber projects in the Buildings theme will benefit from the greater focus on domestic and commercial whole structure decarbonisation signalled in the government's 2021 Heat and Buildings Strategy (https://www.gov.uk/government/publications/heat-and-buildings-strategy).

Many of the actions required to reach the 2030 goal require the support and active engagement of enterprises within and beyond the Local Enterprise Partnership (LSP). Further thought should be given as to how to activate the latent potential of the LSP to implement rapid and effective decarbonisation and adaptation action. The Climate Action initiatives of the Business West (https://www.businesswest.co.uk/ttnz-category/climate-action) may be a model that can activate further change in this regard.

Adaptation and Resilience theme projects are a critical part of the Action Plan and are designed to provide enhanced protection for South Gloucestershire's citizens, infrastructure and the natural environment. In the light of 2022's extreme weather events and the risk to public health, infrastructure and ecosystems, adaption activities need increased attention and support.

Emissions within SGC's scope of control are associated with transport, the commercial, industrial, domestic and public sectors. Mitigation actions should be focused on supporting decarbonisation within each of these sectors. Ramping up of current initiatives such as EV charging, promotion of active travel, domestic retrofit as well as clarity of communications to enable easier access to advice, guidance and services will be required.

The LSP are co-owners of the Action Plan and area wide action is needed. LSP members have reach and impact across the SGC area yet the contribution to the overall project portfolio is modest for net zero, adaptation and nature recovery actions. LSP members can reinforce messaging about the importance of preparing and adapting to extreme weather events in the future. The ESG activities of major companies in South Gloucestershire may provide opportunities and levers for change. The CBI (2022) has recently produced a toolkit for members on how to communicate a firm's decarbonisation journey. Raising awareness of this and other toolkits can be a useful addition to the Council's climate communication work.

Small and medium sized enterprises, not part of the LSP, could be encouraged to engage with Business West's Climate Action initiatives. The Federation of Small Businesses (2021) Accelerating Progress report examines the actions business have already made in the net zero journey and importantly identifies policy gaps and opportunities to enable small business to reach net zero (https://www.fsb.org.uk/resource-report/accelerating-progress.html). This report identifies that over half of small businesses recognise the urgency of the climate crisis but nearly 70% don't know how to measure their carbon emissions. A range of recommendations cover policy, energy, waste, transport and finance that are identified as necessary to support and encourage small businesses on their journey to net zero.

Further work is required to accelerate renewable energy generation within the area and to encourage consumers in the domestic and commercial sectors to switch to a guaranteed renewable tariff. Whilst this will have significant longer term benefits the short term impacts are acknowledged. The 2022 Net Zero Dashboard for South Gloucestershire (https://beta-edit.southglos.gov.uk/wp-content/uploads/South-Gloucestershire-Net-Zero-Dashboard-2022.pdf) reveals that there is 153 MW of renewable energy capacity within the district. Some 98 MW of the installed capacity is solar PV. The installed capacity is equal to 20% of South Gloucestershire' annual average electricity consumption but only 4% of the annual energy consumption from heat, electricity and transport. Only 1 MW of new solar PV was installed in 2021 but a further 176 MW of solar PV are in the planning system. The Climate Change Committee estimates that a UK net zero energy system will need nearly six times more renewable generation capacity than today.

Further consideration should be given to the role of battery storage with the area, currently some 45 MW of battery storage exist in the area according to the Net Zero Dashboard ((https://beta-edit.southglos.gov.uk/wp-content/uploads/South-Gloucestershire-Net-Zero-Dashboard-2022.pdf). There are substantial opportunities to supply heat to major development through district heat networks (DHN) at sites such as the Arena, Brabazon and the Science Park and to connect UWE's existing DHN to the surrounding area. Regional cooperation opportunities include working with Bristol's City Leap initiative to access waste heat from industrial processes operating at Avonmouth.

Other opportunities exist for regional cooperation with neighbouring Unitary Authorities and the West of England Combined Authority which should be explored.

Nature Recovery and Green Infrastructure schemes provide important adaptation measures including shading, cooling and air purification. The development of an asset bank of sites suitable for green and blue infrastructure is an important step forward.

In a recent report Autonomy has explored the relationship between carbon emissions and different income groups in the UK. The report identifies that the top 1% of earners by income are responsible for approximately the same carbon emissions in a single year as the bottom 10% has emitted in more than two decades (https://autonomy.work/portfolio/climate-fund-climate-action/). Policies directed at the high carbon emitting individuals in South Gloucestershire may have a disproportionately beneficial impact when compared to universal policies.

Table 5. Assessment of Continuing Actions Against the Recommendations Made in the Review of the Year 1 Action Plan

Year 1 Review Recommendations for Year 2 Onwards	Review of Continuing Action
Mitigation of Scope 1 and 2 emissions	Good progress across the portfolio.
Further consideration of Scope 3 emissions both Council and District wide.	Limited progress across the portfolio.
Emissions from the consumption of goods and services need to be considered and projects to inspire others to undertake action directed at reducing the embedded carbon in such purchases. The possibility of using GDP to undertake this task should be assessed. LSP members should be encouraged to undertake Scope 3 assessments.	Limited progress across the portfolio
Integration of climate considerations into routine council business	Adoption of the Cornwall Decision Wheel and implementation of Plan 2030 recommendations will enhance compliance with this recommendation.
Action to enhance co benefits of ecological recovery and climate action.	Included as a co-benefit in numerous projects across the portfolio.
Training of staff within the Council and LSP member organisations.	Progress noted but further action needed.
Further development of a Communications Strategy	Good progress with creating and implementing communication campaigns.
Acceleration of adaptation consideration and moving to implementation actions	Adaptation has a greater focus in the year 3 plan but more effort is required to achieve satisfactory levels of awareness of the requirement for adaptation.
Exploration of collaboration opportunities with WECA and local councils to identify early implementation opportunities and possible economies of scale for shared actions.	Progress reported but further opportunities for collaboration and joint working exist.
A greater emphasis in year 2 on community engagement and actions for citizens is desirable and this could link to a local citizen's assembly and /or local COP 26 activity.	Good progress reported.
Offsetting or carbon compensation/ Carbon balancing requires further consideration exploring both the potential and the timing of when such actions should be undertaken. This would be both a direct action for the council and an Inspire activity. Consideration should be given to promoting a WECA wide project with a managed fund established from the proceeds of offsetting and dedicated to reinvestment in verifiable offsetting or carbon management / adaptation projects.	Now a central part of considerations in the Green Infrastructure and Nature Recovery theme.
Consideration should be given to insetting opportunities on council owned land and opportunities for offsetting on the agricultural land within the District, estimated to be 64% of the area.	Consideration included in Green Infrastructure and Nature Recovery theme.

Table 6. Assessment of Actions Against the Recommendations Made in the Review of the Year 2 Action Plan

Year 2 Review Recommendations for Year 3 Onwards	Assessment
Simplification of the portfolio separating plans into mitigation, adaptation and nature recovery headings.	This recommendation has been fully implemented.
Prioritise actions within the portfolio for each Theme	Prioritisation is not yet part of the Action Plan. It remains unclear which actions are the most or least important in terms of achieving the mitigation, adaptation or nature recovery aims.
Provide a timescale for implementation.	Projects do not have a timescale to completion identified.
Provide a timescale of impact - short/medium /long term.	As above, the timescale to achieve the desired impact is not specified. Whilst some projects are likely to continue until 2030 others are likely to have much shorter timescales.
Consider collaborative opportunities with Unitary Authorities and opportunity for WECA to co-finance or remove barriers too implementation.	This element of the portfolio feature in the cross cutting projects, for example in skills and training and funding opportunities, e.g. Woodland Creator Accelerator Fund, and WECA Pollinator Fund. It also features in the Carbon Assessment Tool project where the tool will be used to help guide WECA investment decisions and the Spatial Development Strategy
Review the role of LSP and seek opportunities to more fully engage LSP members in adaptation and mitigation.	The LSP remains an important mechanism to energise and support major employers and agencies within South Gloucestershire on their decarbonisation, adaptation and nature recovery journey. It is not clear that the development of an LSP sub group concerned with the climate emergency has provided the impetus to collective action first envisaged. Further consideration should be given to how the latent potential of the LSP can be realised.
Consider further support for SME decarbonisation including encouragement to participate in Business West's Climate Action initiative.	Useful review of actions to support Business engagement including successful Business Show with a strong climate focus running through it. Training and other support for businesses via communication campaigns clearly evident in the portfolio. It would be helpful to have more details of numbers engaged and feedback on changes within the business as a result of the interventions.

Enhance consideration of mitigation measures, including likely carbon saving from identified schemes, including battery storage, DHNs and within area renewable energy generation.	The carbon savings anticipated from the actions are not clearly identified (see also priority and impact comments above). Greater clarity on this metric would enable an assessment of the gap to be closed and the suitability of the portfolio of projects to achieve the net zero goal.
Enhance consideration of adaptation measures within the Action Plan portfolio.	The portfolio of projects contains 9 projects addressing this theme, 3 of which are in the develop category. A large number of other projects are listed as contributing to the adaptation category although the extent of such impact is not clear.
Further develop and extend the staff training opportunity within the Council.	This recommendation has been embraced and further details of training are now included in the action plan.
Examine the staff training offer within LSP member organisations and offer, again, the training offer.	This has been included in the actions reported in the Year 3 action plan.
Further action to integrate climate consideration within routine council decision making such as the use of the Cornwall Decision Wheel.	The Cornwall Decision Wheel has been trialled in the authority and has been adopted for use from April 2023.

Table 7. Recommendations from Plan 2030 for Consideration in Future Action Plans

Issue to be addressed	Recommended Action
Ambitious and disruptive actions	Innovative ideas and solutions are needed to really drive down emissions. The council has the ambition and some of the powers to implement radical and disruptive actions to achieve change but to do so will require a willingness to act and additional resources of capital, revenue and staff. Actions may include initiatives to develop financial mechanisms to accelerate adoption of decarbonisation activities, development of heat networks, support for home retrofit and the development of large scale retrofit supply chains, actions to support nature recovery and the production and use of bioenergy and green hydrogen. These are ambitious initiatives that go beyond the current scope of business as usual.
Green economic development	Work with existing local business leaders and new businesses to progress and pioneer new green technologies and services which delivers climate solutions -and will boost and future proof the local economy. Progress development of new mechanisms to draw in and scale up external green investment funding.
Internal training	Expand internal training to build awareness and increase capability within the authority and across the district.
Training offer to South Gloucestershire residents and enterprises	Expand the offer of training across the district targeting major employers, schools, town and parish councils, residents association, and places of worship, scouts and guides charities and community groups.
Communication and information campaigns	Re-engineer communication and information campaigns to build awareness of mitigation and adaptation needs and direct residents and enterprises to where support can be found. Engage with LSP, other stakeholders and residents to promote Climate and Nature Emergency training. Prepare and deliver a communications plan including public information and awareness raising activities to encourage mitigation, energy efficiency and adaptation actions in the commercial, business and domestic sectors.
Council policies, plans and funding allocations	The council must align its policies, plans and funding to support the Climate and Nature Emergency through all of its service delivery and back office functions.

Finance	Work with the Climate Emergency team to establish an annual carbon budget for departments alongside the conventional budget. Develop the capacity to assess the climate risk associated with capital and revenue decisions and allocations.
Collaboration with neighbouring authorities, WECA and other agencies	Enhance collaborative action and share good practices with neighbouring single tier authorities and the combined authority to share costs and to drive forward mitigation and adaptation actions.
Lobbying central government	Engage with central government departments to promote South Gloucestershire as a location for pilot and demonstration projects for mitigation and adaptation action and for green job providing enterprises.
Procurement	Embed Climate and Nature Emergency issues into procurement processes. Use procurement processes to request, and require where appropriate, supplier emissions data and mitigation action plans so as to understand the Scope 3 emissions of the council and to develop carbon accounting procedures to track such emissions.
Land use planning	Planning and transport policies and strategies need to be re-engineered to place mitigation and adaptation at the heart of the decision-making process. Business as usual is no longer an option. Planning land use policies must favour new renewable energy developments – wind, solar and small-scale hydro. Ensure that the local plan embeds mitigation and adaptation as its guiding principles and land allocation proposals reflect the known and potential climate risks over the period to 2080. Work with WECA to ensure that the Spatial Strategy integrates mitigation and adaptation into the final plan. Identify suitable land for renewable energy development, wind and solar informed by the RERAS[1]. Review the council's suite of supplementary planning documents to ensure they are aligned with adaption, resilience and mitigation of a changing climate. Ensure that Biodiversity Net Gain requirements, Nature Recovery Networks and Green and Blue Infrastructure priorities and opportunities are considered at the heart of local plan place making, development and decision- making.

[1] AECOM (2021) Renewable Energy Resource Assessment Study. Report for South Gloucestershire Council.

Transport, strategic infrastructure and highways	Work with WECA to ensure that the Transport Strategy integrates mitigation and adaptation into the final plan including implementation of Biodiversity Net Gain. Identify the risks and associated costs of high temperatures regarding risk of melting and combustion points of materials used for existing and new infrastructure. Planning and transport policies and strategies need to be re-engineered to place mitigation and adaptation at the heart of the decision-making process. Business as usual is no longer an option. Highways policies must promote active travel and support the rapid development of charging infrastructure. Ensure that Biodiversity Net Gain requirements, Nature Recovery Networks and Green and Blue Infrastructure priorities and opportunities are considered at the heart of Transport, strategic infrastructure and highways plans and decision-making. Workplace parking levy and public car park charging hypothecating revenue for climate and energy projects.
Net zero building policy	The council should work jointly with the other West of England authorities to produce a set of local planning policies that are aligned, and ensure that all new development, both residential and non-residential, follow the principles of the energy hierarchy and minimises energy demand through fabric energy efficiency measures and then meets all residual energy demand through renewable energy technologies. No use of on-site fossil fuel should be permitted in new developments, and on-site renewable energy generation should be maximised, at least matching the residual energy demand on site. Achieving energy neutral (or even energy positive) development would mean that all new development would be net zero carbon (in terms of operational carbon emissions). Policies should also require embodied carbon emissions to be minimised where possible, and set targets for this to be achieved, ideally aiming for net zero embodied carbon by 2030.
Education and children's services	Climate awareness and action opportunities for schools. Emission mitigation from the school estate. Adaptation of the school estate. Offer Climate and Nature Emergency training to teachers Consider how the development of skills and capabilities for the green economy can be infused across the formal and informal curriculum. Note the vulnerability of young people to rising temperatures, how is shade and ventilation to be provided across the school estate?

	Address the rising prevalence of 'eco anxiety'-linked mental health conditions, particularly among young people, and the evidenced benefits of engagement and agency in positive action opportunities.
Adult social care	Climate risk assessment of commissioning activities. Offer Climate and Nature Emergency training to care home staff. Develop an understanding of the suitability of care homes and other settings to address rising average temperatures, noting the enhanced vulnerability of the elderly to heat stress. Prepare plans to respond to the anticipated increased numbers of displaced people (locally, nationally and globally) due to the changing climate and weather events including increased demand for emergency accommodation.
Public health	Climate risk assessment, plan development and implementation. How will a possible 4^{o}C rise in the global average temperature affect South Gloucestershire? What risks will become manifest across the decades to 2100? Who is the most affected by temperature rises and when? Identify fire risks. What additional risks become real with increased storm activity and high rainfall intensity? Who and where will be affected by fluvial and pluvial flooding? How are these risks communicated and mitigated? Turn awareness into proactive engagement to reduce risk.
Emergency planning	Develop understanding of the scale of projected impacts and develop emergency response plans for identified risks including flooding, heat and fire.
The council estate	Enhance mitigation efforts through energy efficiency measures. Accelerate fleet conversion to non-fossil fuels. Move to renewable energy supply. Develop further renewable energy supply sources. Increase adaptation measures including green/blue infrastructure to increase cooling, shading and flood/drought resilience. Adapt the estate as a demonstrator thereby encouraging confidence within the supply chain.
Staff	In order to deliver these actions and achieve council ambitions and commitments across service areas, more staff resource is urgently needed.

	By having the capacity in place now to progress these actions the council can reduce the costs of impacts from the changing climate locally and be better placed to proactively draw in external funding through bids and new green investment mechanisms.
Avon Pension Fund	Pension contributions will contribute to the Scope 3 emissions of the council, engage with pension providers to advance decarbonisation of the portfolio. Ensure pension trustees are properly trained in Climate and Nature Emergency issues and enabled to challenge investment decisions.

Updated Strategic Context Summary Assessment at End of Year 3 Action Plan

Strategic Context Analysis Using PESTLE (Political, Environmental, Social, Technical, Legal, Economic)

- **Political.** Good political support at the Council level. Similar 2030 targets held by each unitary authority in the WECA/LEP area. South Gloucestershire's target is more ambitious than the UK target of 2050. The interim UK target of a 78% reduction by 2035 will provide additional incentives for action that will support SGC's net zero goal.

- **Environmental.** Emissions are falling but not at the rate needed to meet the UK carbon targets. Adverse weather conditions (rainfall, storm condition, extreme temperatures) are becoming more common with significant public health costs, damage to infrastructure and insurance costs.

- **Social.** Public concern about climate change is growing with the younger demographic particularly concerned. The impacts of a changing climate are not equally distributed with the elderly, the poor and the young most at risk from adverse weather conditions. Rising energy prices provide a further challenge to those in society already vulnerable or financially insecure reducing opportunities for decarbonising or adapting their home. The richest 1% in society emit significantly more carbon per year than the poorest 10% in society.

- **Technical.** The technical understanding of the options for mitigation and adaptation are robust and the technologies are available to make significant cuts to emissions and to adapt buildings and infrastructure.

- **Legal.** The UK Climate Change Act 2008 and the 2019 amendment set out the legal underpinning of the UK's action on climate change. The Net Zero Strategy and the Heat and Building Strategy provide a new emphasis for climate action.

- **Economic.** The costs of mitigation and adaptation need to be considered in the light of the recurring health costs and the infrastructure damage costs. The Stern Review on the Economics of Climate Change, released in 2006, demonstrated that the benefits of early action on climate change far outweigh the costs of not acting. The co benefits of action include significant job creation to adapt buildings and protect infrastructure. These benefits remain significant when compared to the ever increasing costs of inaction associated with extreme weather events impacting on public health, infrastructure and ecosystems. The Glasgow Financial Alliance for Net Zero acts as the umbrella group for financial services firms looking to reach net-zero emissions across their portfolios. The group now counts more than 550 members of which 118 asset managers, 44 asset owners and 53 banks have set shorter-term targets to cut emissions. https://www.reuters.com/business/cop/cop26-year-later-where-do-last-years-climate-pledges-stand-2022-11-01/)

Conclusions

The year 3 action plan progress tracker spreadsheet provides a detailed and thorough report of actions undertaken by the Council to develop and implement climate action across seven broad themes of activity.

The portfolio contains 79 projects, 50 of which are classified as on track. A further 23 projects are classified as amber, signifying minor slippage and some concerns about delivery. Just two projects have no progress and present major concerns. For a complex portfolio of diverse activity this is an impressive position to have achieved.

Plan 2030 estimated that South Gloucestershire as an area will, on current estimates and assuming successful implementation of the UK Net Zero Strategy, have a residual CO_2 emission of some 5-600 kt in 2030. The Year 4 and subsequent action plans should focus efforts on actions that will address this residual emission.

Extreme climate and weather events in 2022 have shown how vulnerable public health, nature and infrastructure are to a changing climate. Adaptation to a changing climate is becoming ever more important and needs to be an increasingly large and visible part of the Council's Action Plan for year 4 onwards.

Nature recovery can and will play an important role in protecting from flooding, providing shading from extreme heat and enhancing public wellbeing. The continued integration of actions promoting climate mitigation and or adaptation with nature recovery are encouraged.

South Gloucestershire Council needs to build on its Climate and Nature Emergency work and plans by increasing capacity to embed the actions within routine council activities and to extend this to all stakeholder engagements and other forms of communication.

Table 8. Progress with Meeting the Climate Strategy Aims at the end of Year 3

Aims of the Climate Emergency Strategy	**Progress Assessment at the end of Year 3**
For South Gloucestershire to become carbon neutral by 2030.	The year 3 action plan builds on the impressive work undertaken in years 1 and 2 and provides a firm foundation for future action. These early years have provided the framework for action and have begun the implementation of a substantial number of actions to address mitigation of emissions. The year 3 portfolio of actions reports considerable efforts in mitigation of emissions but on present evidence a residual carbon dioxide emission of some 5-600 kt is likely in 2030. The majority of this emission will be associated with the domestic, commercial and industrial use of gas. Further efforts are required to enhance energy efficiency in these sectors and to change fuel use.
To maximise the generation of renewable energy from installations located within South Gloucestershire.	Renewable energy generation accounts for 20% of electricity consumption but only 4% of total energy consumption for heat, transport and electricity. With 176 MW of solar PV in the planning system there are still substantial opportunities to be realised before

	the aim of maximising renewable energy generation in South Gloucestershire is realised.
For South Gloucestershire to be prepared for the local impacts of the Climate Emergency.	The year 3 portfolio has an enhanced focus on adaptation measures but substantial work is still needed to implement effective adaptation measures to protect from extreme heat events, flooding and other impacts of a changing climate.
For nature in our local area to be more protected, connected, and healthy and biodiversity increased	Nature recovery is a substantial part of the year 3 Action Plan with 17 projects in the portfolio, 14 of which are at the implementation stage. Nature recovery provides a wide range of climate mitigation and adaptation benefits alongside a wide range of health and wellbeing benefits.
To plant trees across South Gloucestershire by 2030 to double tree cover.	Tree planting initiatives across South Gloucestershire have been a focus of the year 3 Action Plan. A substantial number of trees have been planted but is unclear from the project tracker how much of the target has been achieved and how much remains.

The Council's strongest opportunity and scope for action is its ability to influence, lead, enable and inspire residents and enterprises to take decarbonisation, adaptation and nature recovery actions. If it is willing to fully exercise these capabilities and to effectively integrate climate mitigation, adaptation and nature recovery into all aspects of its core business then South Gloucestershire Council has the opportunity to become a UK leader in its integrated, systematic and strategic response to the Climate and Nature Emergency.

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