Appendix 1: Climate Emergency – Progress Update on Executive Recommendations

Recommendations from November 2019	Actions / Progress and Responsibilities
2.1 The Executive agrees the high level steps to develop and implement the Climate Change Action Plan.	The proposed Action Programme is attached to this Executive report.
2.2 The Executive agrees to include as an addition to the Council vision "Making Warwick District a Great place to live, work and visit" the words "carbon neutral by 2030" when recommending the final version of Business Strategy to Council.	The draft Business Strategy is reported for Executive approval at the February 2020 committee. Once approved, arrangements have been had to progress the communication of the new vision and Strategy accordingly. The Climate Emergency logo has been amended to include 'carbon neutral by 2030'
2.3 The Executive notes the identified carbon footprint of the Council and of the District area as set out and agrees that the measures identified be used to prioritise actions and provide the baseline against which to monitor progress in reaching carbon neutrality by the intended dates on an annual basis.	No further action required. The District baseline data has been further ratified by ATI Projects Ltd and is outlined in the attached report.
2.4 The Executive agrees the strategic direction for addressing the Climate Change Emergency declaration as set out.	No further action required as was agreed at Executive November 2019
2.5 The Executive notes the planned next steps to complete a detailed Climate Change Action Plan with specific costed and measured actions to reduce to zero, the Council's carbon footprint by 2025 and the District's carbon footprint by 2030 with the aim of reporting in February 2020 along with the Council's Business Strategy and Budget proposals. This is to be accompanied by a specific risk register for the action plan.	The proposed Action Programme is attached to this Executive report. The risk register will be developed once a decision has been made. *****

2.6 The Executive notes and supports the work that has and is currently being undertaken by the Council currently to address the impacts of Climate Change, to improve air quality and to encourage sustainable measures and behaviours.	No further action required. Noted at Executive November 2019.
2.7 The Executive tasks the Climate Change Emergency Working Party (CCEWP) to report on the most appropriate approaches to engaging the wider resident, business, public and voluntary communities and organisations in the District to support the adoption of measures that will respond to the Climate Change Emergency and lead to the District being close to net zero carbo by 2030, and to report back with its conclusions and recommendations by February 2020. This work on engagement will also relate to recommendation 2.11.	Current progress contained within the Executive report papers. Further work is required. *****
2.8 The Executive asks the County Council Pension Fund (and the other Council Member organisations of the Pension Fund for their support) to provide annual impact reports on the tonnes of carbon dioxide generated by its investments funds and that in addition it be requested to adopt a strategy for disinvesting from fossil fuel investments by a stated date.	Decisions are to be taken by the relevant pension committee based upon the need to meet pension fund objectives and having regard to the broad employer base and membership of the fund. The fund has an approach to ESG set out in its investment strategy statement and this statement is being reviewed in March 2020. The fund is also looking at setting a climate change strategy at the same time or incorporating regard to climate change explicitly into the ESG statement. The fund has also adopted the Responsible Investment Polices of Border to Coast - who now manage all of our actively managed listed equities and some of our alternatives funds. *****
2.9 The Executive requests that a report be commissioned and provided to it no later than March 2020, which: a) reviews all investments held by Warwick District Council, identifying funds which invest	The Annual Treasury Management Strategy Statement will be reported to March Executive. This will consider where the Council's investments are in relation to fossil fuel. The 2020/21 Treasury Strategy will propose an approach to the Council divesting from direct ownership of fossil fuels companies or commingled

in direct ownership of fossil fuel companies or commingled funds that include fossil fuel public equities and corporate bonds and to report its findings; b) evaluates a potential approach for the Council's Investment Strategy for 2020/21 and beyond, of divesting from direct ownership of fossil fuels companies or commingled funds that include fossil fuel public equities and corporate bonds by no later than 2025.	funds that include fossil fuel public equities and corporate bonds by no later than 2025. *****
2.10 The Executive asks partner agencies (e.g. the other Councils in the sub region and Warwickshire Wildlife Trust) to consider how the Coventry, Solihull and Warwickshire Bio-Diversity Action Plan may be usefully updated to reflect the Climate Change Emergency Declarations.	The Bio Diversity Action Plan is likely to be overtaken by the proposed Environment Act. The WWT has commented that the climate crisis is something that will be considering as part of the future development and implementation of the BAP. The situation goes further than that though as the climate and ecological crisis affects a much broader set of species that are prioritised by BAP species and habitat plans. The climate crisis has the potential to impact all species in our region. Therefore, WDC will continue to explore collaborations with key partners (e.g. the other Councils in the sub region and Warwickshire Wildlife Trust) through the Local Nature Partnership and other strategic partnerships to identify opportunities that address the climate and ecological crisis in a holistic way (e.g. natural flood management, tree planting and wildlife habitat creation). *****
2.11 The Executive engages with the principal public agencies and largest employers, within the District, as listed in Paragraph 3.25 of the report, to support the Climate Change Emergency by them declaring an Emergency. The CCEWP to advise on the engagement process to be deployed as part of its work within recommendation 2.7.	Conversations are being had to engage and work with the districts largest employers to support climate change emergency. The activities required to implement this recommendation is ongoing. Meetings held to date with: WCC; Warwickshire Police; Warwick University; South Warwickshire General Foundation Hospital Trust; South Warwickshire CCG and Warwickshire College. They are at different stages pf progress but all indicate a willingness to travel in the same direction and some feel that working together will help. *****



Taking Action on Climate Change

"Making Warwick District a great place to live, work and visit – and carbon neutral by 2030"

Executive Summary

Abstract

Warwick District Council declared a climate emergency in June 2019 and made a commitment to reducing carbon emissions across the Council's own estate and influencing climate action planning, mitigation and adaptation across Warwick District. Development of a Climate Emergency Action Programme is the first step to formalizing an approach over the next decade, which can bring social, environmental and economic benefits to the communities and businesses across Warwick District and place Warwick District Council in the forefront of addressing climate change.

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Executive Summary

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1. Warwick District Council (WDC) has committed to reducing its own organizational carbon footprint to a net zero target by 2025. This translates to a reduction of 2,948 tonnes CO2 equivalent (CO2e) over 5 years from April 2020 (ref: One Carbon World).

2. WDC sees an opportunity to be an influencer of change within Warwick District and plans to support local communities, organisations and businesses in the implementation of measures designed to reduce the CO2e footprint from its current (2018-19) level of 1,060,131 tonnes CO2e (ref: SCATTER analysis) to net zero by 2030.

3. This Report is in the form of a Climate Emergency Action Programme to address these two declarations and contains a Carbon Management Plan for the Council's own estate and a Climate Emergency Action Roadmap for Warwick District.

4. The Climate Action Programme acknowledges the effectiveness of current carbon reduction activities being undertaken by the Council both within its own estate and across the District. The Programme must also address adaptation and mitigation and identify the Council's role in their delivery.

5. Measures to reduce the carbon footprint of the Council and District and adapt service delivery to address the impacts of extreme weather events will significantly reduce financial risk and generate very real savings to the public finances in the future as well as delivering on corporate responsibilities to the environment and to communities.

6. It will be critical to widen the engagement with the Warwick district community (individuals, residential, commercial, and institutional) to raise awareness of the need to respond to the Climate Emergency and to encourage commitment and ownership of the challenge.

A Carbon Management Plan for the Council

7. A Carbon Management Plan (Work Package 2) has been designed to reduce the Council's own carbon footprint (2,948 tonnes ref: One Carbon World) to net zero over 5 years with costs measures and actions, energy saving and carbon reduction outcomes based on currently available data and assessment tools.

8. Considerable efforts have already been made within the Council to cut energy costs and reduce the Council's carbon emissions. However, to meet the net zero target by 2025 a more concentrated programme of activity and investment is required.

9. In order to track the Council's own carbon management performance, the Council is recommended to approve the preparation of an annual 'budget' for its own carbon performance in parallel with annual reporting on its financial budget.

A Climate Emergency Action Roadmap for Warwick District

10. A Climate Emergency Action Roadmap (Work Package 3) for Warwick District has been prepared to identify the scale of the challenge, suggest key areas of carbon reduction and indicate areas of WDC responsibility and influence.

11. A successful carbon reduction pathway for Warwick District will rely upon successful engagement of a wide range of stakeholders and developing the understanding of the benefits and co-benefits of taking climate action on all sectors of the community.

12. Led by evidence based transformational actions, the Climate Emergency Action Programme should reflect the Council's aspiration and ambition for Warwick District and work with local communities, institutions and businesses to set realistic carbon and energy saving targets and develop a carbon budget. A regular monitoring system will allow for continuous improvement.

13. It is extremely important to demonstrate that addressing climate change can improve lives in ways that matter to residents. Climate change will likely amplify inequality and disproportionately affect the most vulnerable. Leadership will be crucial to success.

14. In order to meet the declared climate emergency targets, it will be important to implement energy, buildings and transport technical solutions whilst actively addressing the need for behavioural change within the District's business, institutional and residential communities.

Resourcing a Climate Emergency Action Programme

15. To meet its own net zero carbon targets by 2025, the Council should ensure sufficient internal resources are provided to design, manage and implement the various carbon reduction measures across the full range of Council services.

16. To meet the net zero carbon target of 2030 for Warwick District, it will require a strategic director with the responsibility to engage and build cooperation with local organisations and businesses, and lead a Climate Emergency Action Team.

17. Adopting a sustainable procurement strategy will be essential to ensure that the Council's projects and contracts align closely with the carbon management plan and contribute to CO2e reduction targets. A formal review of the current strategy, policies and processes would support carbon monitoring and performance across the Council's activities.

Financing carbon reduction measures

18. Implementing carbon reduction actions and measures will have a significant cost as well as many benefits (social, economic, environmental). Sourcing of funding to deliver the Climate Emergency Action Programme for the Council's own estate and to support / encourage the transition across Warwick District will require careful but deliberate allocation of funds. These will be from a combination of Council budgets, from energy savings and from external grants.

Starting the Journey

19. This Climate Emergency Action Programme Report signifies the start of the journey. It represents the Council's commitment to deliver what is possible through direct action. It also reflects the opportunity for the Council to influence and encourage other stakeholder groups to join up and work together and develop and implement solutions that address the real challenge of climate change.

Moving Forward

Work Package 1 – CEAP Programme Establishment

The development of a more detailed and longer-term plan will be one of the outputs of the Climate Emergency Action Programme (CEAP) delivery team within the Council and including partner / stakeholder organisations. Early investment will need to be made to ensure there is awareness of the importance of addressing climate change both within the Council and across Warwick District. To establish an effective programme data collection and reporting systems will need to be in place.

It is understood that it is the Council's intention to acknowledge the importance of this work through the appointment of a Strategic Director for Climate Change to lead the planning and development of the Climate Emergency Action Programme. The Director will be supported by a Climate Emergency Action Team comprising a group of committed individuals and organisations as well as key Council members and officers.

Early stage workstreams:

- Establish Greenhouse Gas (GHG) emissions monitoring and reporting systems (for the Council and District)
- Establish the data set and models using Scatter Phase 2 (from March 2020)
- Identify key stakeholders and establish a Climate Action Programme Team and Technical Advice Board
- Establish the Climate Emergency Action Programme and review plans and targets on a regular basis
- Identify workstreams, stakeholders and partners
- Approve the preparation of an annual 'budget' for carbon performance in parallel with established systems for annual reporting on the Council's financial budget.
- Consider the communication strategies to be used with special focus upon the Warwick District plan
- Develop proposals for a Citizens' Assembly as a means of engaging and consulting local residents
- Establish a Climate Action Fund to support measures which address carbon reduction, adaptation, mitigation, fuel poverty and social equality

Work Package 2 – Carbon Management Plan for the Council

Council Workstreams – to target net zero by 2025

Energy efficiency (non-domestic)

- Carry out energy audits across the whole Council non-residential property portfolio and implement low cost / no cost carbon reduction measures e.g. public buildings; car parks
- Review sub-metering installations as part of an improved energy monitoring strategy
- Source 100 per cent of all electricity purchased by the Council via a 'green tariff'
- Expand the energy awareness campaign amongst council staff and contractors to reduce energy use
- Consider voltage optimization technology to reduce energy consumption
- Reduce energy losses by retro-fit technologies and use of more energy efficient building fabric
- Examine installation of low emission heating for key public buildings e.g. heat pumps; heat network
- Convert rural pathways lighting columns and other public spaces to LED e.g. car parks
- Identify suitable locations for solar photovoltaic (PV) panels on council owned buildings

Transport

- Upgrade the whole council fleet to hybrid (HEV) or full battery electric vehicles (BEV)
- Add to the Council's own estate EV charging infrastructure
- Examine the business case for Vehicle-to-Grid EV charging to reduce energy bills
- Increase the use of EV staff pool car(s) to reduce grey business mileage costs
- Extend sustainable travel incentives for staff including a car share scheme
- Expand opportunities for flexible working

Waste

- Measure waste produced by the Council operations so that it can be reduced and managed
- Reduce printing and paper waste through increase in digital systems and services
- Introduce low emission transport specifications into new waste collection contracts
- Consider how the Council can assist contractors to move to Ultra Low Emission Vehicles through ensuring depots have sufficient power supply and charging infrastructure

Water

- Install water saving technology within all commercial buildings within the Warwick District Council portfolio. This could include water outlet rationalisation adaptors to taps and showers and water pressure regulating systems
- Explore the potential for rain water harvesting systems and treatment

- Inform and encourage all Council staff to reduce water usage by adopting an awareness campaign

Procurement

- Strengthen sustainable procurement policies to purchase/lease energy efficient materials, services and technologies
- Incorporate carbon reduction requirements into new tender contracts including electric vehicles (EVs)
- Ensure new build and refurbishment contracts meet high sustainability standards set by the Council and adhere to these during construction
- Ensure contracted out service proposals e.g. leisure centre operations; cleaning services, include and deliver high levels of sustainability and demonstrate commitment to carbon reduction

Biodiversity / greenspaces

- Phase out peat use, redesign mowing regimes and support adaptation measures such as tree planting for carbon sequestration and 'cooling-off' benefits
- Use Council owned land to increase biodiversity and carry out tree planting
- Continue to work with Environment Agency, WCC, business organisations and community groups to develop flood mitigation measures and tree planting schemes across the district
- Ensure that the Local Plan sets developments and land use standards that reduce carbon and increase sustainability

Work Package 3 – Warwick District Climate Emergency Action Roadmap

The Council does not have direct control over most of the Greenhouse Gas Emissions (GHG) throughout the District. However, the Council is in a key position to enable and influence communities, businesses, institutions and individuals, raise awareness of carbon and other GHG emissions and identify what they can do collectively to mitigate against climate change. The Council can also enable and incentivise such actions and initiatives using Council budgets and / or external grants and loans. The role and influence of planning policy should not be underestimated in realising net zero carbon ambitions for the District by 2030.

The key sector priorities for action are transport (particularly in the shorter term the reduction of private use petrol and diesel cars), and the reduction of gas usage for space heating in both domestic and non-domestic buildings.

Warwick District Workstreams

Project Establishment – the Climate Emergency Programme Team should:

- Develop the District's Climate Emergency Action Plan and costings for a 10-year programme to meet net zero targets. The roadmap for the District presented in WP3 is intended as an initial input into the planning work to be undertaken by the Climate Emergency Action Programme team once appointed.
- Adopt SCATTER Phase 2 once it is released and identify other data sources to link actions to carbon reductions year on year, to confirm priority of measures, to prepare emissions budgets and to adjust reduction targets.
- Establish budgets and secure funding for the programme delivery
- Identify availability of Section 106 and CIL (IFS) along with external grants and loans to match fund carbon neutral initiatives and sustainable transport solutions
- Establish a responsive local monitoring, forecasting and reporting method for GHG emissions enabling collation of data and emissions reporting across the District. This needs to cover energy use and account for changes in land use from activities like tree planting. The impact of the Local Plan needs to be accounted for both in terms of transport and housing.

Influence of Planning

In the coming decade, Warwick will have to improve the efficiency of all its buildings to reduce the demand for energy. Low carbon and/or renewable heating, energy reduction and an increase in the adoption of energy efficiency technologies in both commercial and domestic buildings will be required. Actions could be to:

- Ensure that the planning system, led by the Local Plan, sets developments and land use standards aimed at reducing carbon emissions and building sustainable communities
- The population of the District is likely to increase over the next 10 years, the Local Plan has an important role to play in minimizing the impact on emissions of that increase but in transport and housing
- Develop a spatial strategy that minimises the need to travel by placing new developments in locations that are accessible to services by sustainable modes of transport and/or ensures new developments integrate a wide range services
- Plan ahead for large scale infrastructure investments e.g. new transport hubs and interchanges; green power generation sites – moving radically away from trying to address congestion in the traditional ways
- Develop and implement policies that will deliver improved net zero carbon building standards - subject to national policy
- Consider how town centres can develop as a focus for communities – for leisure, work and retail – and ensure these are accessible by means other than the private car
- Ensure that green open spaces and cycle / pedestrian pathways are part of the design of new housing and regeneration development

- Ensure carbon reduction features and BREEAM standards are included in major development schemes
- Encourage innovation and green design through supplementary planning documentation (SPD)

Transition to Low Emission Transport

In 2017, nearly a third of Warwick's total CO2 emissions (32.9%) came from transport and mostly road transport from cars, vans, lorries and buses. Action is needed to reduce car journeys, increase cycling and walking, and improve public transport and more low emission vehicles. Such action will achieve better air quality, mobility and health for citizens. Actions could be to:

- Encourage the shift from petrol and diesel cars to electric vehicles (EVs) thereby reducing emissions from commuting and short journey use
- Expand the network of electric vehicle (EV) chargepoints across the Warwick district as part of a county-wide scheme
- Encourage taxi fleet conversion to EVs – using external grant schemes to support additional costs of vehicle purchasing, and working with WCC to provide suitable re-charging points
- Promote modal transport shifts from the use of cars to cycling, walking and public transport through increase of safe routes and encouraging work-based changing facilities where locations permit
- Engage local employers and encourage the introduction and investment in Green Travel Plans promoting low emission commuting schemes, best practice and remote working / home working.
- Work with WCC, local businesses and other organisations e.g. Transport for West Midlands; Sustrans; Chiltern Railways on a Sustainable Transport Strategy for the District and region which would have wider and more integrated transport emission benefits
- Require buses and taxis to be low emission/alternative fuel by 2030
- Examine differential parking charges for low emission vehicles in council car parks

Improve Council owned housing

As a responsible landlord, the Council will need to invest in council homes to enable tenants to reduce their energy bills, have warmer homes and lower their carbon footprint. Actions could be to:

- Review all Council homes to identify current standards and provide funding to expand the property retrofit programme needed to bring councils homes to the required EPC level 'C' by 2030 (Fuel Poverty Act FPA)
- Examine the business case and other benefits of going beyond FPA requirements on all the Council's residential portfolio i.e. achieving EPC 'B' or higher
- Extend the Council's pilot scheme to test alternative construction methods for new low energy council homes

- All new council housing to be built to the highest energy standards (EPC 'A' or 'B')
- Consider the installation of solar PV on council owned homes following a roof and energy usage survey
- Complete a Fuel Poverty Action Plan; identify the measures that might alleviate fuel poverty by 2030

Manage Energy Use – Households

In the coming decade, Warwick District will have to improve the efficiency of all buildings to reduce the demand for energy and convert to low carbon and/or renewable heating**.** Actions could be to:

- Invest in community engagement campaigns which will encourage and target carbon emission reduction e.g. gas heating – with particular focus upon 'hard-to-heat' properties
- Early priorities will be to reduce household emissions resulting from gas heating through building efficiency improvements and switching to green energy
- Facilitate and incentivise energy efficiency measures to households in fuel poverty
- Extend energy advice campaigns to reduce household energy consumption and energy costs
- Provide a Climate Action Fund designed to incentivise and 'pump prime' initiatives, and develop feasibility studies, pilot schemes and campaigns that encourage energy efficiency and carbon reduction actions amongst residential communities and individual households.

Develop Business and Economic Opportunity

Warwick District is already an attractive location for business relocation and inward investment. The Council could promote the District as a new hub for low carbon technology and service industries – representing an economic growth opportunity. Actions could be to:

- Continue to encourage and expand inward investment and relocation of innovative low carbon technology enterprises engaged in the low carbon energy, transport and construction sectors
- Work with businesses and corporate organisations to initiate and share Circular Economy initiatives
- Ensure that business infrastructure is resilient to the risks of Climate Change

Manage Energy Use – Commercial and Institutional

Action will be needed to become more energy efficient and significantly expand local low carbon sources of energy with the capacity to store energy and encourage new energy generating technologies. Actions could be to:

- Encourage commercial and institutional organisations to develop their own carbon reduction action plans and share their work with other high energy users.
- Encourage a collective approach to reducing energy use and generating renewable energy
- Develop a district-wide Net Zero Campaign based on energy efficiency
- Explore the feasibility of suitable alternatives to natural gas heating and establish pilot and demonstration schemes
- Provide a Climate Action Fund designed to incentivise and 'pump prime' initiatives, feasibility studies, pilot schemes and campaigns that encourage energy efficiency and carbon reduction actions amongst businesses

Include Adaptation

Forward planning rather than reacting to extreme weather events as they occur is essential. This process of adjusting to changes in climate should be part of any long-term business strategy by WDC to implement adaptation policies alongside carbon reduction work. Actions could be to:

- Ensure that forward planning within the Council and across the district is the norm rather than as a reaction to extreme weather events as they occur.
- Encourage businesses, institutions and community organisations to include adaptation measures within their long-term business strategy alongside carbon reduction activities and investments.
- Prepare case studies of best practice from within and outside of Warwick district.

Build Local Strategic and Delivery Partnerships

The carbon footprint can only be reduced to net zero by 2030 by a concerted effort by many stakeholders and partners across the District. WDC is in a strong position to lead, coordinate and influence. Actions could be to:

- Build effective partnerships with private and commercial stakeholder groups to design and deliver a district-wide carbon reduction plan
- Engage and collaborate with regional and national organisations to deliver low carbon initiatives
- Encourage the involvement of community groups and individuals through the establishment of a Citizens Assembly
- Acknowledge the role that the younger generation can play in raising awareness and stimulating action around climate change through cooperation with educational institutions, youth groups and the Youth Parliament

Lobby Government

The Council should also work alongside other councils and organisations to lobby government for more resource and powers to enable delivery of climate action programmes, and include the following messages:

- Government should set the highest priority to addressing Climate Change and fund accordingly
- Climate change impact should be at the heart of government policy, regulation and investment
- Government should set high standards for upgrade of existing homes and the building of new homes, with special focus upon social housing
- Increase financial incentives that encourage people to adopt renewable technologies – especially for low income households
- Statutory reporting of carbon emissions within the public sector should be re-introduced
- Support energy efficiency, renewable energy, power supply innovation and ensure that there is strategic grid enforcement procedures in place
- Support a national funding incentive scheme for householders to enable them to install renewable energy measures and energy efficiency measures
- Deliver a major commitment and investment to encourage a modal shift in transport to include electric vehicles, sustainable public transport, cycling and walking.



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18. Implementing carbon reduction actions and measures will have a significant cost as well as many benefits (social, economic, environmental). Sourcing of funding to deliver the Climate Emergency Action Programme for the Council's own estate and to support / encourage the transition across Warwick District will require careful but deliberate allocation of funds. These will be from a combination of Council budgets, from energy savings and from external grants.

Starting the Journey

19. This Climate Emergency Action Programme Report signifies the start of the journey. It represents the Council's commitment to deliver what is possible through direct action. It also reflects the opportunity for the Council to influence and encourage other stakeholder groups to join up and work together and develop and implement solutions that address the real challenge of climate change.

Moving Forward

Work Package 1 – CEAP Programme Establishment

The development of a more detailed and longer-term plan will be one of the outputs of the Climate Emergency Action Programme (CEAP) delivery team within the Council and including partner / stakeholder organisations. Early investment will need to be made to ensure there is awareness of the importance of addressing climate change both within the Council and across Warwick District. To establish an effective programme data collection and reporting systems will need to be in place.

It is understood that it is the Council's intention to acknowledge the importance of this work through the appointment of a Strategic Director for Climate Change to lead the planning and development of the Climate Emergency Action Programme. The Director will be supported by a Climate Emergency Action Team comprising a group of committed individuals and organisations as well as key Council members and officers.

Early stage workstreams:

- Establish Greenhouse Gas (GHG) emissions monitoring and reporting systems (for the Council and District)
- Establish the data set and models using Scatter Phase 2 (from March 2020)
- Identify key stakeholders and establish a Climate Action Programme Team and Technical Advice Board
- Establish the Climate Emergency Action Programme and review plans and targets on a regular basis
- Identify workstreams, stakeholders and partners
- Approve the preparation of an annual 'budget' for carbon performance in parallel with established systems for annual reporting on the Council's financial budget.
- Consider the communication strategies to be used with special focus upon the Warwick District plan
- Develop proposals for a Citizens' Assembly as a means of engaging and consulting local residents
- Establish a Climate Action Fund to support measures which address carbon reduction, adaptation, mitigation, fuel poverty and social equality

Work Package 2 – Carbon Management Plan for the Council

Council Workstreams – to target net zero by 2025

Energy efficiency (non-domestic)

- Carry out energy audits across the whole Council non-residential property portfolio and implement low cost / no cost carbon reduction measures e.g. public buildings; car parks
- Review sub-metering installations as part of an improved energy monitoring strategy
- Source 100 per cent of all electricity purchased by the Council via a 'green tariff'
- Expand the energy awareness campaign amongst council staff and contractors to reduce energy use
- Consider voltage optimization technology to reduce energy consumption
- Reduce energy losses by retro-fit technologies and use of more energy efficient building fabric
- Examine installation of low emission heating for key public buildings e.g. heat pumps; heat network
- Convert rural pathways lighting columns and other public spaces to LED e.g. car parks
- Identify suitable locations for solar photovoltaic (PV) panels on council owned buildings

Transport

- Upgrade the whole council fleet to hybrid (HEV) or full battery electric vehicles (BEV)
- Add to the Council's own estate EV charging infrastructure
- Examine the business case for Vehicle-to-Grid EV charging to reduce energy bills
- Increase the use of EV staff pool car(s) to reduce grey business mileage costs
- Extend sustainable travel incentives for staff including a car share scheme
- Expand opportunities for flexible working

Waste

- Measure waste produced by the Council operations so that it can be reduced and managed
- Reduce printing and paper waste through increase in digital systems and services
- Introduce low emission transport specifications into new waste collection contracts
- Consider how the Council can assist contractors to move to Ultra Low Emission Vehicles through ensuring depots have sufficient power supply and charging infrastructure

Water

- Install water saving technology within all commercial buildings within the Warwick District Council portfolio. This could include water outlet rationalisation adaptors to taps and showers and water pressure regulating systems
- Explore the potential for rain water harvesting systems and treatment

- Inform and encourage all Council staff to reduce water usage by adopting an awareness campaign

Procurement

- Strengthen sustainable procurement policies to purchase/lease energy efficient materials, services and technologies
- Incorporate carbon reduction requirements into new tender contracts including electric vehicles (EVs)
- Ensure new build and refurbishment contracts meet high sustainability standards set by the Council and adhere to these during construction
- Ensure contracted out service proposals e.g. leisure centre operations; cleaning services, include and deliver high levels of sustainability and demonstrate commitment to carbon reduction

Biodiversity / greenspaces

- Phase out peat use, redesign mowing regimes and support adaptation measures such as tree planting for carbon sequestration and 'cooling-off' benefits
- Use Council owned land to increase biodiversity and carry out tree planting
- Continue to work with Environment Agency, WCC, business organisations and community groups to develop flood mitigation measures and tree planting schemes across the district
- Ensure that the Local Plan sets developments and land use standards that reduce carbon and increase sustainability

Work Package 3 – Warwick District Climate Emergency Action Roadmap

The Council does not have direct control over most of the Greenhouse Gas Emissions (GHG) throughout the District. However, the Council is in a key position to enable and influence communities, businesses, institutions and individuals, raise awareness of carbon and other GHG emissions and identify what they can do collectively to mitigate against climate change. The Council can also enable and incentivise such actions and initiatives using Council budgets and / or external grants and loans. The role and influence of planning policy should not be underestimated in realising net zero carbon ambitions for the District by 2030.

The key sector priorities for action are transport (particularly in the shorter term the reduction of private use petrol and diesel cars), and the reduction of gas usage for space heating in both domestic and non-domestic buildings.

Warwick District Workstreams

Project Establishment – the Climate Emergency Programme Team should:

- Develop the District's Climate Emergency Action Plan and costings for a 10-year programme to meet net zero targets. The roadmap for the District presented in WP3 is intended as an initial input into the planning work to be undertaken by the Climate Emergency Action Programme team once appointed.
- Adopt SCATTER Phase 2 once it is released and identify other data sources to link actions to carbon reductions year on year, to confirm priority of measures, to prepare emissions budgets and to adjust reduction targets.
- Establish budgets and secure funding for the programme delivery
- Identify availability of Section 106 and CIL (IFS) along with external grants and loans to match fund carbon neutral initiatives and sustainable transport solutions
- Establish a responsive local monitoring, forecasting and reporting method for GHG emissions enabling collation of data and emissions reporting across the District. This needs to cover energy use and account for changes in land use from activities like tree planting. The impact of the Local Plan needs to be accounted for both in terms of transport and housing.

Influence of Planning

In the coming decade, Warwick will have to improve the efficiency of all its buildings to reduce the demand for energy. Low carbon and/or renewable heating, energy reduction and an increase in the adoption of energy efficiency technologies in both commercial and domestic buildings will be required. Actions could be to:

- Ensure that the planning system, led by the Local Plan, sets developments and land use standards aimed at reducing carbon emissions and building sustainable communities
- The population of the District is likely to increase over the next 10 years, the Local Plan has an important role to play in minimizing the impact on emissions of that increase but in transport and housing
- Develop a spatial strategy that minimises the need to travel by placing new developments in locations that are accessible to services by sustainable modes of transport and/or ensures new developments integrate a wide range services
- Plan ahead for large scale infrastructure investments e.g. new transport hubs and interchanges; green power generation sites – moving radically away from trying to address congestion in the traditional ways
- Develop and implement policies that will deliver improved net zero carbon building standards - subject to national policy
- Consider how town centres can develop as a focus for communities – for leisure, work and retail – and ensure these are accessible by means other than the private car
- Ensure that green open spaces and cycle / pedestrian pathways are part of the design of new housing and regeneration development

- Ensure carbon reduction features and BREEAM standards are included in major development schemes
- Encourage innovation and green design through supplementary planning documentation (SPD)

Transition to Low Emission Transport

In 2017, nearly a third of Warwick's total CO2 emissions (32.9%) came from transport and mostly road transport from cars, vans, lorries and buses. Action is needed to reduce car journeys, increase cycling and walking, and improve public transport and more low emission vehicles. Such action will achieve better air quality, mobility and health for citizens. Actions could be to:

- Encourage the shift from petrol and diesel cars to electric vehicles (EVs) thereby reducing emissions from commuting and short journey use
- Expand the network of electric vehicle (EV) chargepoints across the Warwick district as part of a county-wide scheme
- Encourage taxi fleet conversion to EVs – using external grant schemes to support additional costs of vehicle purchasing, and working with WCC to provide suitable re-charging points
- Promote modal transport shifts from the use of cars to cycling, walking and public transport through increase of safe routes and encouraging work-based changing facilities where locations permit
- Engage local employers and encourage the introduction and investment in Green Travel Plans promoting low emission commuting schemes, best practice and remote working / home working.
- Work with WCC, local businesses and other organisations e.g. Transport for West Midlands; Sustrans; Chiltern Railways on a Sustainable Transport Strategy for the District and region which would have wider and more integrated transport emission benefits
- Require buses and taxis to be low emission/alternative fuel by 2030
- Examine differential parking charges for low emission vehicles in council car parks

Improve Council owned housing

As a responsible landlord, the Council will need to invest in council homes to enable tenants to reduce their energy bills, have warmer homes and lower their carbon footprint. Actions could be to:

- Review all Council homes to identify current standards and provide funding to expand the property retrofit programme needed to bring councils homes to the required EPC level 'C' by 2030 (Fuel Poverty Act FPA)
- Examine the business case and other benefits of going beyond FPA requirements on all the Council's residential portfolio i.e. achieving EPC 'B' or higher
- Extend the Council's pilot scheme to test alternative construction methods for new low energy council homes

- All new council housing to be built to the highest energy standards (EPC 'A' or 'B')
- Consider the installation of solar PV on council owned homes following a roof and energy usage survey
- Complete a Fuel Poverty Action Plan; identify the measures that might alleviate fuel poverty by 2030

Manage Energy Use – Households

In the coming decade, Warwick District will have to improve the efficiency of all buildings to reduce the demand for energy and convert to low carbon and/or renewable heating**.** Actions could be to:

- Invest in community engagement campaigns which will encourage and target carbon emission reduction e.g. gas heating – with particular focus upon 'hard-to-heat' properties
- Early priorities will be to reduce household emissions resulting from gas heating through building efficiency improvements and switching to green energy
- Facilitate and incentivise energy efficiency measures to households in fuel poverty
- Extend energy advice campaigns to reduce household energy consumption and energy costs
- Provide a Climate Action Fund designed to incentivise and 'pump prime' initiatives, and develop feasibility studies, pilot schemes and campaigns that encourage energy efficiency and carbon reduction actions amongst residential communities and individual households.

Develop Business and Economic Opportunity

Warwick District is already an attractive location for business relocation and inward investment. The Council could promote the District as a new hub for low carbon technology and service industries – representing an economic growth opportunity. Actions could be to:

- Continue to encourage and expand inward investment and relocation of innovative low carbon technology enterprises engaged in the low carbon energy, transport and construction sectors
- Work with businesses and corporate organisations to initiate and share Circular Economy initiatives
- Ensure that business infrastructure is resilient to the risks of Climate Change

Manage Energy Use – Commercial and Institutional

Action will be needed to become more energy efficient and significantly expand local low carbon sources of energy with the capacity to store energy and encourage new energy generating technologies. Actions could be to:

- Encourage commercial and institutional organisations to develop their own carbon reduction action plans and share their work with other high energy users.
- Encourage a collective approach to reducing energy use and generating renewable energy
- Develop a district-wide Net Zero Campaign based on energy efficiency
- Explore the feasibility of suitable alternatives to natural gas heating and establish pilot and demonstration schemes
- Provide a Climate Action Fund designed to incentivise and 'pump prime' initiatives, feasibility studies, pilot schemes and campaigns that encourage energy efficiency and carbon reduction actions amongst businesses

Include Adaptation

Forward planning rather than reacting to extreme weather events as they occur is essential. This process of adjusting to changes in climate should be part of any long-term business strategy by WDC to implement adaptation policies alongside carbon reduction work. Actions could be to:

- Ensure that forward planning within the Council and across the district is the norm rather than as a reaction to extreme weather events as they occur.
- Encourage businesses, institutions and community organisations to include adaptation measures within their long-term business strategy alongside carbon reduction activities and investments.
- Prepare case studies of best practice from within and outside of Warwick district.

Build Local Strategic and Delivery Partnerships

The carbon footprint can only be reduced to net zero by 2030 by a concerted effort by many stakeholders and partners across the District. WDC is in a strong position to lead, coordinate and influence. Actions could be to:

- Build effective partnerships with private and commercial stakeholder groups to design and deliver a district-wide carbon reduction plan
- Engage and collaborate with regional and national organisations to deliver low carbon initiatives
- Encourage the involvement of community groups and individuals through the establishment of a Citizens Assembly
- Acknowledge the role that the younger generation can play in raising awareness and stimulating action around climate change through cooperation with educational institutions, youth groups and the Youth Parliament

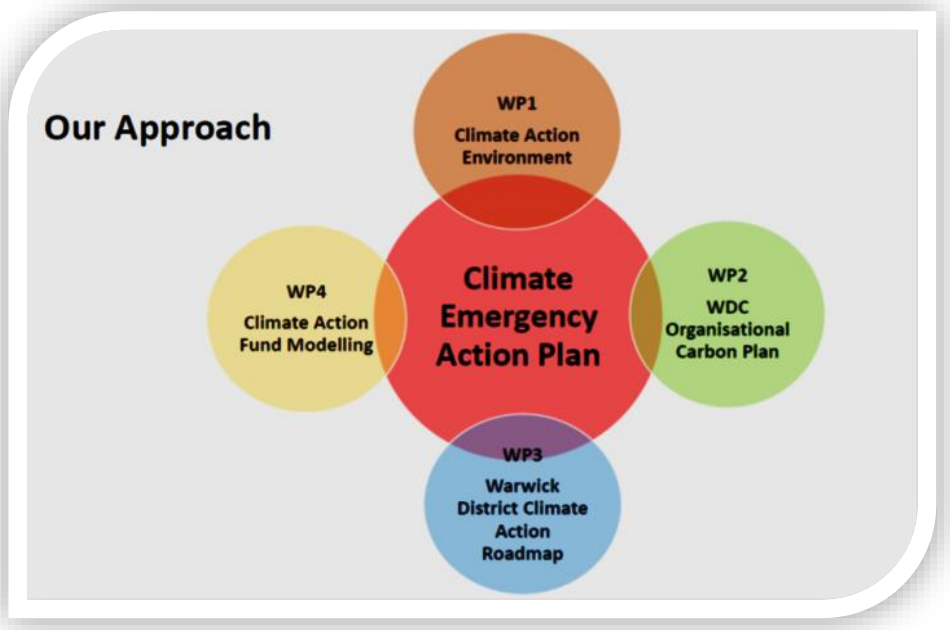
Lobby Government

The Council should also work alongside other councils and organisations to lobby government for more resource and powers to enable delivery of climate action programmes, and include the following messages:

- Government should set the highest priority to addressing Climate Change and fund accordingly
- Climate change impact should be at the heart of government policy, regulation and investment
- Government should set high standards for upgrade of existing homes and the building of new homes, with special focus upon social housing
- Increase financial incentives that encourage people to adopt renewable technologies – especially for low income households
- Statutory reporting of carbon emissions within the public sector should be re-introduced
- Support energy efficiency, renewable energy, power supply innovation and ensure that there is strategic grid enforcement procedures in place
- Support a national funding incentive scheme for householders to enable them to install renewable energy measures and energy efficiency measures
- Deliver a major commitment and investment to encourage a modal shift in transport to include electric vehicles, sustainable public transport, cycling and walking.

Project Approach

This Report proposes a Climate Emergency Action Programme designed to address the two net zero targets set within the Climate Emergency declarations set by the Council in June 2019. It contains a Carbon Management Plan for the Council's own estate (Work Package 2) and a Climate Emergency Action Roadmap for Warwick District (Work Package 3). Attention was also given to possible climate emergency funding models.



A Carbon Management Plan for Warwick District Council

A Carbon Management Plan (Work Package 2) has been designed to reduce the Council's own carbon footprint (2,948 tonnes CO2e ref: One Carbon World) to net zero over 5 years with costs of measures (actions), energy saving and carbon reduction outcomes based on currently available data and assessment tools. The Consultants draw attention to the considerable efforts that have already been made within the Council to cut energy costs and reduce the Council's own carbon emissions. However, to meet the net zero target by 2025 a more concentrated programme of activity and investment is required.

A series of Carbon Reduction Measures has been produced to indicate areas of activity over the next 5 years that could take place – and leading to a net zero figure by 2025. However, the timescales and resource available for this first step in developing the Climate Emergency Action

Programme (CEAP) has meant that the measures proposed have been based on desk studies i.e. no site assessments and therefore are for information and further investigation.

Carbon Reduction Measures are illustrative and can be added to, removed or replaced according to priorities and investment decisions. Such changes will of course impact upon the costs and savings as well as the delivery programme.

The resulting measures are summative and a costplan is included to indicate the costs of actions, the energy and fuel savings that might result, and the reductions in CO2e that might ensure. Where possible a payback period has been suggested.

The net result is a 'carbon descent' profile that indicates the possible implementation schedule over a 5-year period. This schedule will be governed by budgetary considerations as well as delivery resources within the Council.

A Warwick District Climate Emergency Action Roadmap

Context

This interim Roadmap for the district wide climate emergency action plan is intended to meet the reporting requirement needed for the end of January 2020 that will, in turn, support the 2020-21 budgeting cycle. This Roadmap indicate a direction of travel for the programme.

Key to the successful delivery of the 10-year programme to bring Warwick District's GHG emissions to as close to net zero as possible is the appointment of an internal team to run the programme. It is expected that this Roadmap will support that team's more detailed planning going forward as they will own the delivery of the CEAP Programme.

Additionally, if SCATTER is to be used for further planning and modelling the impact of measures (the 'Pathway Feature'), the functionality (termed Phase 2) will not be available until Spring 2020 and will go through a user acceptance test before release. Once SCATTER Phase 2 is available and the decision has been taken to use the tool, it would be advisable to re-run key calculations.

Given the scale, complexity and urgency of responding to climate change, it is proposed that the District CEAP is seen as iterative in nature. While setting out the medium to long term roadmap to carbon neutrality, it is also likely that an annual update will be needed, to capture the rapid changes being delivered under the Action Plan, and to ensure it is reflective of the likely rapidly changing national and international context.

Designing a Climate Action Plan for Warwick District

A Climate Action Plan must scope the resources needed, identify and define assets and systems, assess information, identify responses and opportunities and undertake a prioritisation exercise. A logical framework will help design the council's own process for analysing climate change impacts, vulnerability and risk; and then enable the prioritisation and formulation of responses and the development of a detailed, timed and costed Climate Action Plan, which can steer the District towards net zero carbon emission status by 2030.

A Climate Change Action Plan is a strategic document (or series of plans and documents) that demonstrates how a district will deliver on its commitment to address climate change. It will determine the vision and political commitment and demonstrate leadership

The Action Plan should show the effectiveness of current activities undertaken by the Council and an analysis of the additional activities that need to be taken to address both adaptation and mitigation (for the definition see the Index). Led by evidence based transformational actions, it should aspire to ambitious, but realistic targets and a carbon budget. An audit and monitoring system will allow for regular and continuous improvement.

Developing a co-benefits approach

As important as understanding the current starting point, the setting of targets and the action plan, will be the development of ways to engage stakeholders and develop the understanding of the benefits and co-benefits of taking action on all sectors of the community. It is extremely important to demonstrate that addressing climate change can improve lives in ways that matter to residents. Climate change can amplify inequality and affect the most vulnerable disproportionately. Leadership will be crucial to success.

Environmental: Adaptation, Resilience	WDC achieves its carbon reduction target by 2025 combatting the effects of climate change through a range of adaptation measures e.g. green spaces, planting trees, flood alleviation, and maintaining biodiversity
Social: Health, Social Equity, Fuel Poverty	WDC engages with other local organisations and partners (private and public) on designing and delivering carbon initiatives to ensure that the Council is leading by example, ensuring socialisation and acting as a positive influence for change
Economic: Growth, Energy Efficiency, Jobs	WDC delivers its public services efficiently within a sustainable procurement environment to maintain focus upon carbon emission reduction and encourage low carbon business supply and growth

Defining multiple co-benefits: An example of making homes energy efficient[1]

Action	CO2	Health	Economy	Equity	Resilience
Energy efficient homes	Cuts energy demand and carbon emissions	Reduces fuel poverty	Creates jobs and saves on energy bills	Increases access to affordable warmth	Households are better placed to withstand future energy bills as well as overheating

Communicating a Climate Action Programme

Climate change, the impacts it may have and what can be done to address change is a complex issue. It presents policy and operational challenges that do not sit comfortably within the responsibility of any one organisation or local government department and requires a different style of thinking and governing to address the problems involved. The dissemination of the actions that can be taken has to be communicated to those who can make the most difference.

A capacity to work across organizational boundaries, to think holistically and to involve the public is important as is an understanding of both what is valued by, and what can deliver co-benefits to residents.

Local Government leadership and vision is an essential part of this drive to achieve change. The planning system, in particular, can influence patterns of development, which can have long-term impacts on the environment, and information enables people to make informed choices.

The dissemination of the actions that can be taken has to be communicated to those who can make the most difference and to those whose lives will be most impacted. People connect to climate change issues in many different ways, but it is in their homes and communities where they will experience the direct impacts.

Councils across the country have used a variety of means to communicate with residents and involve them in the decision-making processes both at the start and during the period of change. Oxford City Council and Camden Borough Council organized Citizens Assemblies, others have taken a 'resource board' approach.

Case Study: On 21 May 2019 Carbon Neutral Cambridge organised the Zero Carbon Futures Symposium in partnership with the Greater Cambridge Shared Planning Service, South Cambridgeshire District Council and Cambridge City Council. The event was supported by the University of Cambridge's Centre for the Study of Existential Risk, and local businesses. 51% of the 57 expert participants and speakers were council officers or councillors. Other participants included representative from universities, the built environment sector, local charities, young people and community groups.

[1] Climate Action co-benefits: A toolkit for city regions and local authorities, Ashden 2019

Citizens Assemblies, Commissions and Symposiums:

A number of Council's have organised citizens Assemblies including Oxford and Camden. Both involved a randomly-selected representative sample of 50 residents who learned about climate change and explored different options to cut carbon emissions through a combination of presentations from experts and facilitated workshops. The Panel was asked to think about proposed actions and these have included renewable energy installations, buying certified green energy, biodiversity work, tree planting and increased recycling.

Camden's Citizens' Assembly agreed 17 actions they wanted taken forward. As the result of the Oxford Assembly, a climate emergency budget of £19m was agreed. (£1m operational and £18m capital investment).

Leeds and Bristol established Mini-Stern reports on the economics of addressing climate change. Cambridge City Council organised a Zero Carbon Futures Symposium with neighbouring councils, academics, councilors, representatives of local charities and environmental groups to aid policy development.

Moving Forward

Warwick District Council could establish a Climate Action Partnership of stakeholders and the wider community, to work with the Council to provide advice, support and encouragement to communities, businesses and charitable organisations to help to mitigate their emissions and adapt to the inevitable impacts of the climate crisis.

An Annual Climate Forum or Summit could be organised to work with partners including Warwick University and neighbouring councils.

The climate crisis is of particular significance for young people. The Council could work with the County Council schools across the county to provide opportunities for schools and young people to contribute directly to the development and implementation of the Climate Emergency Strategy.

Developing Partnerships

There is considerable potential for work across authorities on cross boundary projects, policies and standards. Areas of collaboration can include communications, housing standards, transport and energy policy.

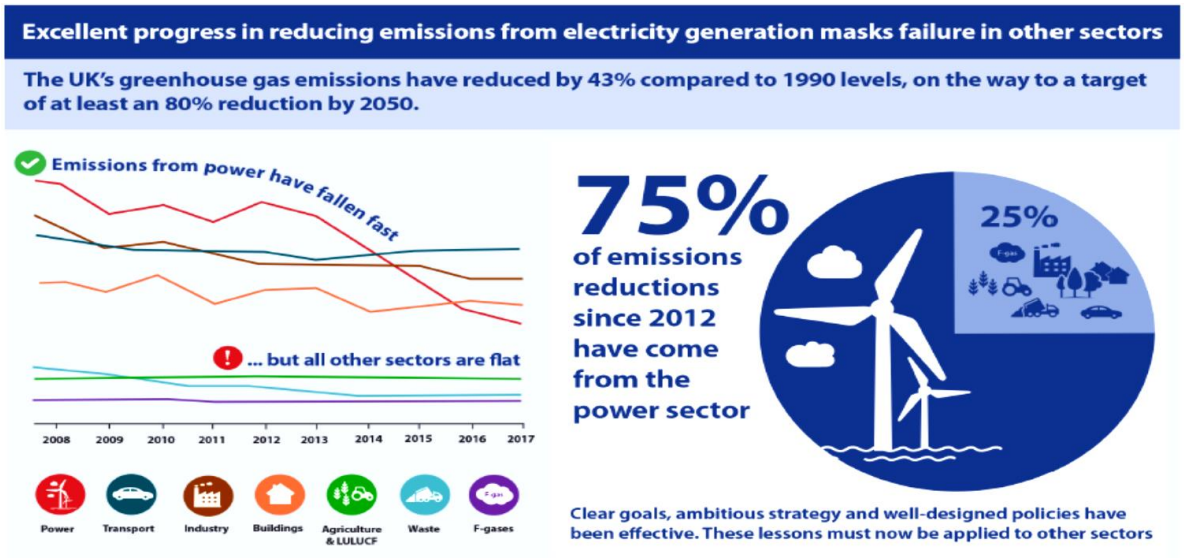
Case Study: Hull council has partnerships with Heywoods, Hull and East Yorkshire Woods and the Northern Forest. In this tree-planting season, the local authority will plant 14,000 trees, which is the most planting across the whole Northern Forest area. This feeds into work around carbon sequestration, and understanding what type of planting should be done and where. The council is also looking at different habitats and grassland areas of the Humber estuary, to see how carbon can be captured in those areas.

A Climate Emergency Action Programme (Work Package 1)

We have known about the science of climate change for more than quarter of century, but, as noted by the RTPI/TCPA in 2018,[2] action across the country has been far too slow. In 2018, the year of the hottest temperatures ever recorded in the UK, and in many places around the world, the Committee on Climate Change gave a strong message that 2019-20 is likely to be the most important yet in defining the UK's climate credentials. In the words of their Chief Executive: 'New targets are cheap; real progress is harder'[3].

Most of the reduction to reduce greenhouse gases (GHG) has resulted from changes within the power sector. Strong UK policies have closed coal plants and supported remarkable increases in renewable generation, accompanied by dramatic reductions in costs, far beyond the level once believed possible. Emissions from waste are also down 48% since 2008 – an unsung story, the outcome of EU regulation and the UK landfill tax.
We should celebrate this progress, but it masks a worrying trend in other sectors.

In this report, we refer to the 'uneven' balance of emissions reduction. In the last five years, emissions outside of power and waste have plateaued. Costs of renewables (large-scale wind and solar) falling below cost/MW of coal plants. Progress in other sectors has been flat or shown a minimal reduction.



Source; 2018 Progress Report to Parliament, Committee on Climate Change

[2] Rising to the Climate Crisis. A Guide for Local Authorities on Planning for Climate Change 2018
[3] https://www.theccc.org.uk/2019/12/18/2020-must-be-the-year-of-climate-action/

The Challenge Ahead

The challenge ahead is to translate the current momentum into coordinated action across all areas for which councils have a direct responsibility and to embed it into all their policies and strategies.

Climate change will affect many of the services provided by local authorities. Impacts could range from increased flooding, drought, health impacts as well as more frequent heatwaves. Local authorities have responsibilities for promoting wellbeing in economic, social and environmental terms for their residents. Actively preparing for climate change will contribute to resilience and should be a high priority.

Climate change adaptation, a large and important aspect of resilience, will rely on organisational innovation within councils and their ability to work in partnership with other public bodies, such as water companies, the Environment Agency, telecoms, and infrastructure providers as well as, crucially, with their residents.

Local Authorities can play a leadership role and use powers including their planning powers. Beyond areas within their direct control, the local authority can raise expectations, communicate, develop partnerships, work with other local organisations and groups and provide support for local business and communities.

At a national level, the Committee on Climate Change (CCC) has written to the Prime Minister prioritising five key areas: *(see: https://www.theccc.org.uk/publication/letter-ccc-writes-to-the-new-prime-minister/):*

- "**Buildings**. An ambitious and properly funded strategy for entirely removing fossil fuels from the UK's building stock, with action beginning immediately and standards that set a clear path for the longer-term.
- **Transport**. Rapid progress in the implementation of the manifesto commitment to consult on an earlier phase-out of petrol and diesel cars, ideally by 2030.
- **Electricity**. Delivering on the manifesto commitment for 40GW of offshore wind by 2030 – and ensuring that any market reforms are complementary to the Net Zero goal.
- **Industry**. Developing an ongoing mechanism to pay for emissions reductions from industry and an approach to delivering hydrogen and CCS infrastructure, alongside your promised capital support.
- **Land use and agriculture**. Introducing a world-leading package through the Agriculture and Environment Bills to cut emissions from agriculture and to pay for the 30,000 hectares (75,000 acres) of annual tree planting promised in the manifesto."

The CCC also highlights the importance of addressing the need for adaptation if we are to be prepared for the changes ahead; these include addressing flood risk, managing the risks from extreme heat, reducing the risk of drought and protecting the natural environment.

Above all, the transition to net zero must also be fair - and be seen to be fair – if it to become successful.

What do 'Carbon Neutral' and 'Net Zero' mean?
'Carbon neutral' or 'net zero' typically mean the same thing: Some carbon/GHG emissions remain but are then 'netted off' or off-set through carbon dioxide removal. Such removal may occur due to Negative Emissions Technologies (NETs) such as biomass energy with carbon capture and storage, or, natural sequestration via means such as afforestation. The UK's Net Zero target includes all GHGs (not just those from within the energy system). Warwick District Council needs to define the nature and extent of 'offsetting' that is feasible within the Local Authority boundary during the course of this study.

Celebrating achievements

In addressing the Climate Change Challenge the Intergovernmental Panel on Climate Change (IPCC) reported in October 2018:

"Global warming could be halted should emissions reach and be sustained at "net zero global anthropogenic CO2 emissions".

In response to this unprecedented challenge, Warwick District Council declared a 'Climate Emergency'; with ambition to:

1. Become a net-zero carbon organisation, including contracted out services, by 2025 in terms of scope 1, 2 and 3 emissions.

2. Facilitate decarbonisation by local businesses, other organisations and residents so that total carbon emissions within Warwick District are as close to zero as possible by 2030.



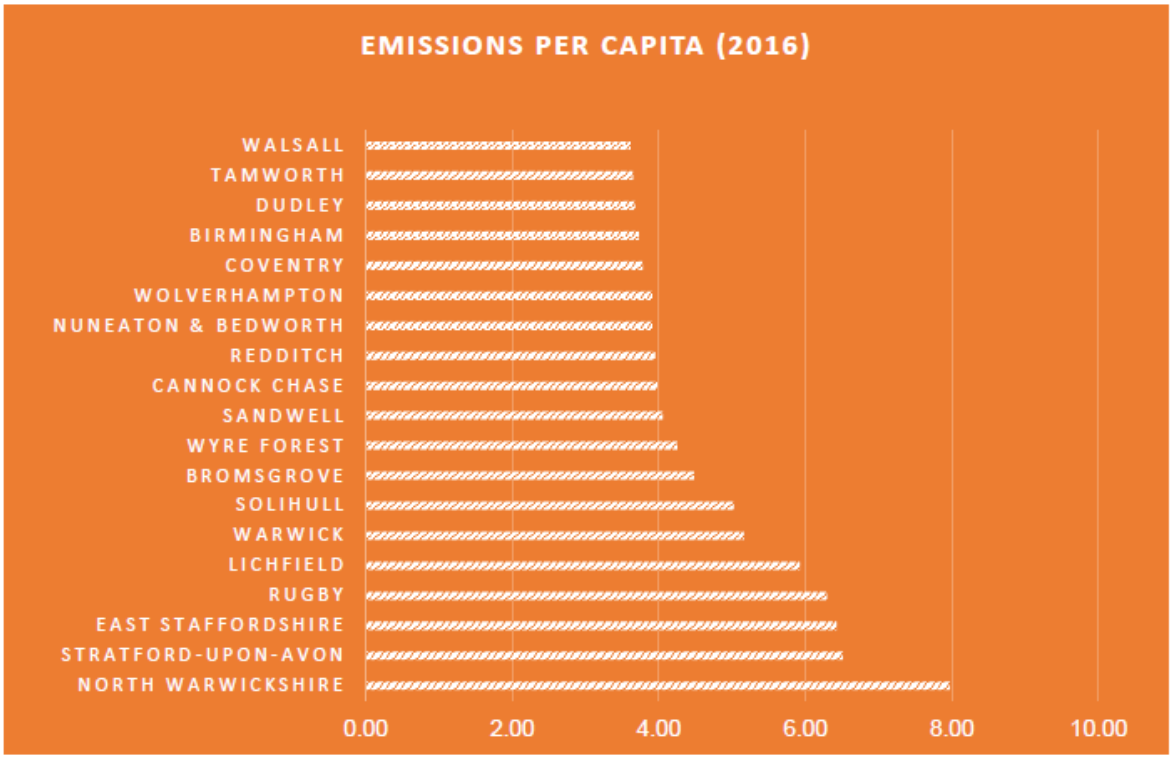
Warwick District Council has been engaged in carbon reduction planning especially across its own estate for a number of years. This is demonstrated through a number of reports and reviews including:

- Low Carbon Action Planning and Implementation Review (2011 ~ Greenwatt)
- Low Carbon Action Plan (2012 ~ Encraft)
- Strategic Approach to Climate Change 2016-2020

- Air Quality Annual Status Report (2018 Bureau Veritas)
- Setting Climate Commitments for Warwick (2019 Tyndall Centre)

The Council established a Sustainability Officers Group (SOG) in 2017 to coordinate the various and several initiatives and actions being researched and undertaken to improve the carbon footprint of the Council's activities and estate, as well as introducing ideas for supporting CO2e emissions reductions across Warwick District. These measures have included:

- Training for staff and council members
- A plastics policy
- A sustainable travel action plan
- A sustainable procurement policy
- Paper reduction initiatives
- A district heating scheme assessment
- Further energy efficiency and CO2e reduction investigations are also underway e.g. solar park



Further work is needed to reduce the carbon footprint of Warwick District. The graph above from the West Midlands Combined Authority shows the ranking of CO2e emissions (in tonnes) per capita for the year 2016 for each local authority in the WMCA 3-LEP area.

Defining the powers of the District Council

The District Council has the ability to use a range of powers, plus political commitment and leadership to address the challenge. The Council can:

- Develop a Carbon Management Plan for its own organisation and estate
- Use strategic planning as a key power
- Continue to develop effective local and strategic plans to deliver a range of key solutions to climate change issues including renewable energy measures
- Use ownership of land and building stock to encourage energy efficiency measure and clean technologies uptake
- Encourage investment to drive change
- Support energy efficiency advice and fuel poverty measures
- Use procurement, particularly in waste and leisure centres to drive change
- Support the deployment of low emission vehicles and in particular electric vehicles

Define the potential partnerships for Warwick District Council

One of the most powerful levers for the Council is the ability to develop partnerships for a collective approach by pooling skills, influence and resources. Partners can include Warwickshire County Council, Coventry and Warwickshire Local Enterprise Partnership (CWLEP), West Midlands Combined Authority, the Health Authority, Transport for West Midlands, local business groups and corporates, environmental organisations such as the Wildlife Trust and the Environment Agency, community energy groups, parish and town councils, and individuals. The Council can also seek Government support and lobby for change.

Define the Commitment:

As part of its Climate Emergency Declaration (June 2019), Warwick District Council has expressed its clear commitment to:

1. Become a net-zero carbon organisation, including contracted out services, by 2025 in terms of scope 1, 2 and 3 emissions.
2. Facilitate decarbonisation by local businesses, other organisations and residents so that total carbon emissions within Warwick District are as close to zero as possible by 2030.
3. Work with other local councils to lobby central government to help address the above points including by funding and changing regulation.
4. Engage with and listening to all relevant stakeholders including members of the Warwickshire Youth Parliament regarding approaches to tackling the climate emergency.
5. Ensure that tackling the Climate Emergency is central to the strategic business plan – in terms of both adaptation and mitigation.

Define the actions to meet the commitments:

Key actions can include:

- **Innovation:** Using new ideas, technologies, services and processes can make positive changes quicker and more effectively.
- **Leadership:** Leading by example and promoting the ideas and perspectives of influencers and policymakers can inspire and make a difference.
- **Collaboration:** Identifying partnerships and brokering connections between sectors can develop more powerful, sustainable solutions.
- **Celebration of success:** Sharing good practice, promoting achievements and stakeholders enabling successful practice to be scaled up and applied elsewhere.

Understanding the problem

For district councils, the LGA recommends the focus of climate change action should be:

Internal	External
• Planning • Energy efficient buildings and assets • Changes to procurement and contract management • Changes to vehicle fleet and travel arrangements • Working practices i.e. home-working; embracing reduce/reuse/recycling	• Improved flood protection • Regeneration and development • Community development • Educating/enabling communities to be more aware of carbon and other greenhouse gas emissions and what they can do collectively to mitigate against climate change

Reducing emissions from the Council's own estate and operations contributes to meeting carbon budgets and also demonstrates leadership and good practice. The main opportunities are to improve energy efficiency and reduce emissions within the council's own buildings, street lighting (where applicable), transport fleet, procurement and influence contractors and other local businesses.

WDC Strategic Approach to Sustainability and Climate Change 2016-2020

WDC has adopted a Strategic Approach to Sustainability and Climate Change which sets out how the Council will respond to the challenges and opportunities presented by the transition to a low-carbon, sustainable district. The strategy outlines the overarching aims, key objectives and includes an action plan setting out how the Council will achieve them. The strategy is reviewed and updated on a regular basis.

Summary:

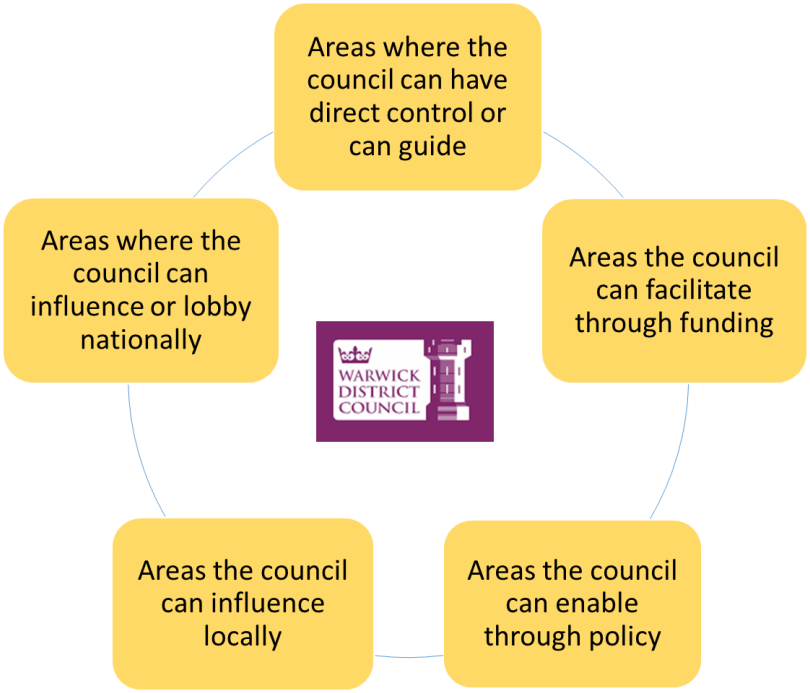
The Ambition	Mitigation and Adaptation	Community Awareness
Warwick District Council will act to reduce GHG emissions across all its areas of influence, including its own operations, helping to create the conditions for a smart, innovative, low-carbon economy	Risks from climate change-related impacts are managed and resilience is increased through consistent mitigation and adaptation planning and actions based on the best scientific information	Community awareness of climate change mitigation and adaptation solutions increases and organisations and individuals know what they can do to improve the long term resilience and sustainability of the district

Role of the Council:

Warwick District Council has direct control over a small (c 0.3%) of the total emissions of the district, but has a wider range sphere of influence within Warwick District itself. These include:

- Areas where the council can have direct control or can guide
- Areas the council can enable through funding
- Areas the council can enable through policy
- Areas the council can influence locally
- Areas where the council can influence or make the case nationally

The Council cannot provide all of the solutions, as combating climate change needs system wide change that involves communities, business, individuals and stakeholders across all sectors.



The current objectives and strategies of the Council

- To reduce emissions from Council estate and operations
- To reduce emissions and energy consumption from homes and businesses by promoting energy efficiency measures, sustainable construction, renewable energy and behaviour change.
- To reduce emissions by supporting sustainable transport options, reducing car travel and traffic congestion and encouraging transport modal shift.
- To reduce consumption of resources, increasing recycling and reducing waste.
- To support Council services, residents and businesses to adapt to the impacts of climate change.

Making the measurements

The development of a Climate Change Action Plan requires the collation of key data and information from wide and varied sources. Measuring and setting baselines, then monitoring the results, will be an essential part of ensuring progress.

The DEFRA guidelines[4] emphasise that the principles that should be applied when collecting and reporting on environmental impacts should be relevant, quantitative, accurate, consistent, comparable and transparent.

Since 2015, local authorities in England were requested by Government to measure and report their GHG emissions from their own estate and operations[5]. However, this was not a mandatory requirement for councils to report this data.

Current Greenhouse Gas Reporting

In the 2008-9 Greenhouse Gas Report the gross GHG emissions for the Council's own estate and operations in 2008/09 was reported as 5,461 tonnes CO_2 e and as 6,375 tonnes CO_2 e in 2012/13. A recent analysis by One Carbon World carried out in 2019 reported a figure of 2,948 tonnes (excludes emissions from WDC council homes and waste).

The data from which these analysis were made - and therefore the reported outcome figures calculated - may require some caution to ensure that like-for-like figures were used. Nevertheless, this seems to represent a significant reduction.

[4] Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance, DEFRA, March 2019

[5] Via a letter to local authorities, see: www.gov.uk/guidance/sharing-information-ongreenhouse-gas-emissions-from-local-authority-own-estate-and-operations-previously-ni-185

By comparison, the full carbon footprint (2018/19) for the District has been estimated by SCATTER at approximately 1,060,131 tonnes (1,060kt) Co2e – demonstrating the very low contribution that the Council makes to the overall District CO2e emissions (0.3%)

In the 2012/13 GHG Report, WDC reported that the areas that contributed to the bulk of emissions from their own estate and operations were:

- Heating and electricity from operational sites such as office buildings, leisure centres (now contracted out), car parks, sports pavilions and public conveniences
- Fuels consumed by fleet vehicles (refuse trucks and vans), non-road going vehicles and plant such as lawn mowers
- Travel for work purposes i.e. business grey fleet - fuel consumed in staff-owned vehicles and from the use of public transport
- Council's own operational waste deposited in landfill sites
- Water consumption within Council's estate where they pay the water bills

The Council has continued to keep records of their own use energy and as indicated above, has made considerable improvements with regard to energy efficiencies and carbon reductions. However, there is a need to ensure that this data is easily accessible and used for regular reporting on climate change activities. To go beyond own-use statistics requires the use of Government data – and tools for local authorities e.g. SCATTER are currently being developed.

Moving forward

In order to track the Council's carbon management performance, the Council is recommended to approve the preparation of an annual 'budget' for its carbon performance in parallel with established systems for annual reporting on its financial budget.

To inform the preparation of the Strategy, and to act on its objectives, the Council should approve a Climate Emergency Programme Delivery team constituting key officers who are leading various streams of activity across the full range of Council services and under the leadership of a senior manager.

Measures to reduce Warwick District Council's own carbon footprint as an organization and adapt service delivery to address the impacts of extreme weather events will significantly reduce the financial risk and generate very real savings to the public finances – as well as delivering on corporate responsibilities to the environment and to communities.

Defining the Current Carbon Profile

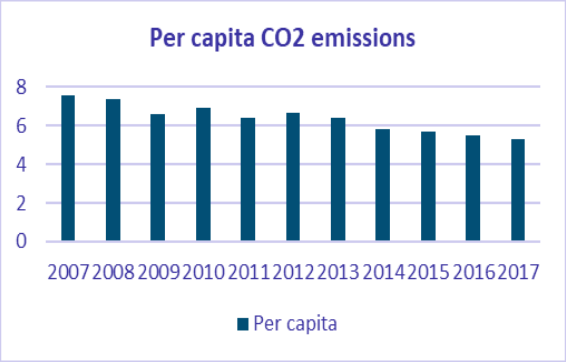
Tools and reports available:

Government statistics:

Both local and regional carbon dioxide (CO2e) emissions estimates for 2005-2017 are available to provide a nationally consistent evidence base for sub-national greenhouse gas emissions. These estimates can be used as an important body of information by local authorities (LAs) and other relevant organisations to help identify high emitting sources of CO2e and energy intensive sectors, monitor changes in CO2e emissions over time and to help design carbon reduction strategies.

Government statistics held by the Government's Department for Business, Energy and Industrial Strategy (BEIS) look at local authority CO2e emissions and estimates of CO2e emissions that are within the scope of the influence of a local authority (excluding large industrial estates, railways, motorways and land use) shows a decline with the exception of transport. Per capita emissions have also dropped overall. However, the rate of decline may be insufficient to meet the CO2e targets set. The figures below indicate that per capita CO2e emissions have fallen but those from transport have not.

Per capita district CO2e emissions 2007 - 17[6]



ktCO2e emissions within the scope of <u>influence</u> of WDC 2005 - 17[7]



SCATTER data suggests that the District's current carbon footprint amounts to 1,060,131tonnes CO2e. Warwick District Council is directly responsible for its own carbon performance and for adapting its services to respond to the likely impacts of climate change. It has influence over aspects of the carbon performance in the district but cannot control the entirety.

[6] BEIS Energy Consumption in the UK 2018
[7] BEIS statistics

Tyndall Report 2019:

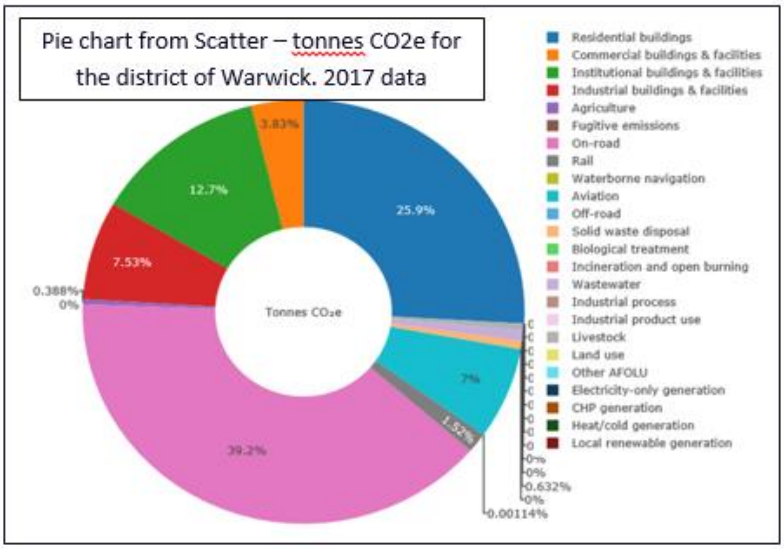
The Tyndall Centre for Climate Change Research produced a report for all councils using Government district wide data. The results in the Tyndall Report[8] show that for Warwick District to make its fair contribution to delivering the Paris Agreement's commitment to staying "well below 2°C and pursuing 1.5°C" global temperature rise, an immediate and rapid programme of decarbonisation is needed. The Report summarises that at 2017 CO_2 emission levels, Warwick District will exceed the recommended budget available within 6 years:

"To stay within the recommended carbon budget Warwick district will, from 2020 onwards, need to achieve average mitigation rates of CO2 from energy of around -13.8% per year. This will require that Warwick district rapidly transitions away from unabated fossil fuel use".

SCATTER:

SCATTER is a local authority focused emissions tool[9], built to help local authorities become low carbon. The tool is in an early stage of development (Phase 2 expected early March 2020) and aims to simplify the measurement of emissions, helping local authorities to model scenarios, set reduction targets and take action.

The SCATTER tool uses a range of national and local public datasets to provide quantified outputs without local authorities needing to spend significant resources on data collection. However, it looks at mainly district wide data as gathered by Government and this has to be borne in mind when considering the outputs. The initial carbon footprint for Warwick District is shown below:



[8] Tyndall Report citation November 2019
[9] Scatter analysis

The full carbon footprint (2018/19) for Warwick District has been estimated by SCATTER at approximately 1,060 Kt Co2e as shown in the chart below. The principal components of the footprint are residential buildings 25.9% and transport (32.9%). Institutional buildings contribute 12.7% to the footprint.

Summary greenhouse gas emissions (metric tonnes CO2e)		Scope 1	Scope 2	Scope 3	
Sector	Sub-sector	Total tCO2e	Total tCO2e	Total tCO2e	Total tCO2e
		DIRECT	INDIRECT	OTHER	TOTAL
Stationary energy	Residential buildings	146,182.18	88,187.45	38,852.42	273,222.05
	Commercial buildings & facilities	19,340.73	14,877.40	6,185.68	40,403.81
	Institutional buildings & facilities	40,777.20	75,178.63	17,958.56	133,914.39
	Industrial buildings & facilities	24,004.96	43,579.66	11,847.39	79,432.02
	Agriculture	4,097.99	1.53	978.52	5,078.05
	Fugitive emissions	-	-	-	-
Transportation	On-road	413,738.62	IE	-	413,738.62
	Rail	16,077.97	IE	3,833.51	19,911.48
	Waterborne navigation	11.89	NO	2.83	14.72
	Aviation	-	IE	73,888.08	73,888.08
	Off-road	-	IE	-	-
Waste	Solid waste disposal	6,668.51	-	-	6,668.51
	Biological treatment	-	-	-	-
	Incineration and open burning	-	-	-	-
	Wastewater	8,716.89	-	-	8,716.89
IPPU	Industrial process	0.03	-	NE	0.03
	Industrial product use	0.00	-	NE	0.00
AFOLU	Livestock	5,142.82	-	NE	5,142.82
	Land use	- 0.01	-	NE	- 0.01
	Other AFOLU	NE	-	NE	-
Generation of grid-supplied energy	Electricity-only generation	-	-	-	-
	CHP generation	-	-	-	-
	Heat/cold generation	-	-	NE	-
	Local renewable generation	-	NE	NE	-

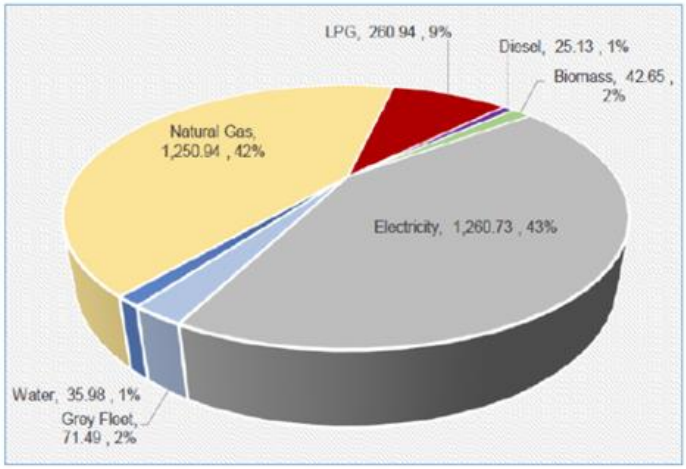
Total (ALL)	**1,060,131.46**
Total Optional	**1,046,271.72**
Total Optional (Excluding Agriculture, Fugitive Emissions, Waterborne Navigation, Aviation, All Waste)	**940,710.88**
Total Stationary Energy	532,050.31
Total Transportation	507,552.91
Total Waste	6,668.51
Total IPPU	8,716.89
Total AFOLU	5,142.82

Not Occuring
Integrated Elsewhere
Not Estimated
Confidential
Combination of notation keys
N/A
Required
Optional

One Carbon World:

One Carbon World estimated the District Council's own footprint as 2,947 tonnes CO2e excluding social housing, air conditioning and waste emissions. (**Note:** OCW calculations for biomass are incorrect and represent only 4.2 tonnes CO2e)

WDC Organisation Carbon Footprint – sources of CO2e by emission activity



Asset	tonnes CO2e	%
Electricity	1260.73	43%
Natural Gas	1250.94	42%
LPG	260.94	9%
Grey Fleet	71.49	2%
Biomass	42.65	2%
Water	35.98	1%
Biomass	42.65	2%

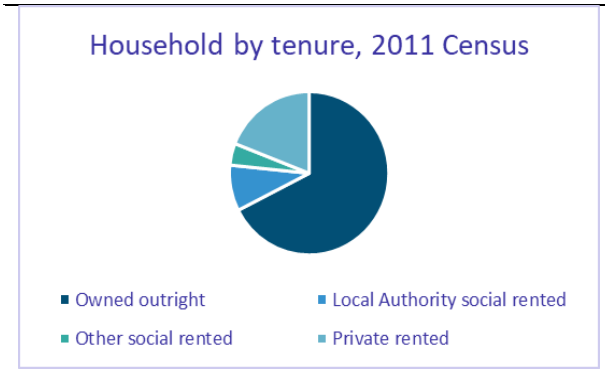
2,947 tonnes CO2e excludes social housing, aircon, waste emissions

Council Owned Housing and Energy Efficiency Advice to Residents

Energy and energy efficiency advice:

The Climate Change Committee Report 'UK Housing: Fit for the Future?'[10], warned that targets will not be met without near-complete elimination of greenhouse gas emissions from UK buildings and highlighted that emissions reductions have stalled and energy use increased in recent years. The technology and knowledge exists to create high quality, low carbon and resilient homes exists but changes in Government policies and insufficient resources have slowed progress.

WDC Household ownership/tenure distribution from 2011 census data



All buildings in WDC area



Current Action

Implementation of home insulation schemes is a key area for action. The Council works in partnership with Act on Energy who provide free, impartial advice to residents on all aspects of home energy efficiency, including grants for insulation, boilers and switching energy suppliers. Such measures help to lower energy bills, improve comfort and address the potential health issues of inadequately heated homes.

Social housing:

It is up to councils to decide under GHG reporting to allocate which scope social housing falls under. As WDC owns its own council housing stock, it has a duty as landlord to ensure properties are well insulated and have energy efficient heating systems. This provides tenants with the opportunity to reduce energy costs and contribute to reduced CO2e emissions. It does not however guarantee that such savings will be made – as this is often dependent upon

[10] UK Housing: Fit for the Future? CCC report February 2019

household 'energy behaviour'. This highlights the need to extend and expand the energy awareness campaign as a co-requisite to property retro-fit actions.

WDC has evidenced that some 50% of properties have EPC certification (December 2019). The Council can direct and finance the level of retro-fit necessary to bring homes up to the levels of Energy Performance required (under Fuel Poverty Act) over the next 10 years.

Estimates have been made in calculations based upon current EPC ratings already completed by WDC. However it is a strong recommendation that the remaining 50% of council homes are assessed to identify the appropriate level of retro-fit required – and the energy and carbon savings that will accrue.

Importantly the social benefit accruing from warm homes will be a priority for the Council as 'responsible landlord'. Almost all the Council's own social housing stock has been fitted with energy efficient boilers, minimum levels of loft insulation and, where appropriate, cavity wall insulation. According to data received, approximately 85 properties (not including flats) have no gas boiler. Another 55 have a gas connection, but may not have a meter and would still benefit from a review of their heating and its affordability.

There are still a significant number of 'hard to treat' older dwellings with uninsulated solid walls. A full condition survey of the entire stock is required to inform a long-term housing investment strategy. This will include options for upgrading energy efficiency ratings. The Council's housing team, as well as Act on Energy, give advice to Council tenants and help administer home energy efficiency grant funding applications.

Privately-owned stock:

One of the biggest challenges in reducing domestic energy use in the District is with the existing privately owned stock. Despite work over many years, there remains scope for significant improvements in this area. Average domestic consumption per household in Warwick District Council area reduced between 2012 and 2017. However, further reductions will be needed in the future.

2012	2013	2014	2015	2016	2017
4410	4314	4332	4314	4236	4225

Source: Sub-national electricity consumption statistics Gov.UK kWh

WDC promote the local charity Act on Energy to support their Home Energy Conservation Act (HECA) responsibilities, provide free home energy efficiency advice and support to all residents in the District through energy drop-in days and linking to community groups and activities. The

Home Energy Conservation Act requires local authorities to improve the energy efficiency of residential properties, assess the needs of residents and help support residents in energy efficiency, fuel poverty and keeping warmer in their homes. There is a requirement to provide progress reports at two-yearly intervals.

The HECA 2019 Report on actions taken by WDC between April 2017 and March 2019:

Warm and Well in Warwickshire is measured and evaluated by both the Standards Assessment Procedure (SAP) energy-rating scheme as well as health outcomes. The average increase in SAP ratings for Warwick district properties under Warm and Well in Warwickshire physical interventions was 15 points, which indicates good progress. Act on Energy service achieved the following from April 2017 to March 2019.

	No of Events /measures	Clients receiving 121 advice	Energy Saving Kwh	Monetary Savin
Events (saving based on the typically 33% take up of advice includes switching)	18	362		£31,515
Presentations (saving based on 33% take up of advice includes switching)	8	175		£15,235
Home Visits	39	43		£10,289
Heating Measures	45		165,915	£7,650
Loft insulation	13		16,068	£728
Cavity wall insulation	27		70,362	£4,185
Telephone Line (saving based on 33% take up of advice includes switching)		551		£47,968

During the reporting period, the HEART Partnership has achieved the following:

- 6 boiler repairs
- 12 full heating installations
- 8 removed category 21 hazards for excess cols
- 4 referrals for external wall insulation to be completed.

Direct comparison between the 2017 and 2019 HECA reports is hindered by changes to Government requirements. In the 2015 HECA Report, the Council, using 2012 data, reported that 1,055 GWh of energy was consumed in the district for domestic purposes, which was an 18% reduction since 2005.

A comparison with other neighbouring councils shows a comparable range depending on the Service Level Agreement in place, and therefore the level of activity and advice available to the Council and residents.

ECO and ECOFLEX. Through work between Act on Energy and WDC, residents in Warwick District received support for a variety of home improvement measures:

Funding source	No of units	Funding	Totals
ECOFLEX			
Boiler replacements	5	£10,233.35	
Loft insulation	13	£13,466.84	
Cavity wall insulation	27	£46,396.23	
			£70,096.42
ECO	1	£12,039.79	
			£12,039.79
			£82, 136.21

Energy Performance Certificates - EPC

From October 1st 2008, all buildings which are built, bought, sold or rented need to have an EPC. The EPC has two parts: An efficiency rating A-G and recommendations for improvement. The aim of the EPC is to ensure anyone looking to purchase or rent a home is fully informed about performance in terms of energy consumption. The Government have a target to make all fuel-poor homes to be EPC Band C by 2030 and as many homes as possible to be EPC Band C by 2035.

The annual costs for householders to have a warm well-lit home every day and enough hot water are three times higher for the least efficient properties.

EPC Band A – C	**£940**
EPC Band D	**£1190**
EPC Band E	**£1510**
EPC Band F	**£2000**
EPC Band G	**£2860**

The table below gives an illustration of the savings that can be made by taking suitable energy efficiency measures:

Property type	Energy use kWh/m2 per annum	CO2 emissions tonnes/ annum	Heating costs £/annum
Existing houses	**265**	**4.69**	**799**
New houses	**86**	**1.66**	**295**

Mean floor area, energy use and CO2e emissions for existing and new domestic buildings in England in July/September 2019[11]

Act on Energy Service Level Agreement:

Act on Energy have a Service Level Agreement (SLA) with WDC for 60 hours a year for energy efficiency advice, mainly given at community centres. The SLA does not cover home visits. The SLA from WDC to Act on Energy determines the amount of assistance available. Act on Energy offers a service shared with 12 other local authorities and supports local authorities to deliver their obligations under HECA. WDC benefits from the Warmer Well in Warwickshire programme. Act on Energy are contracted by Warwickshire County Council to offer a service to households with cold related health conditions, which allows home visits.

Warwick District Council works with five local councils across Warwickshire to operate a service called HEART - Home Environment Assessment and Response Team. This service has been set-up with a focus on disabled adaptations and home improvements.

Moving forward:

Poorly insulated homes waste energy and lead to high emissions and unnecessarily high-energy bills for residents. The Council could consider an ambitious programme working with partners to improve the insulation of their own-stock social housing and privately owned housing. This should take account of best practice. The Council should prioritise interventions that generate a positive and direct return on investment. Within these investments the Council should prioritise those that benefit those members of public of greatest need first, for example energy efficiency measures installed in affordable and social housing. Well-insulated homes mean an EPC rating of Levels A, B or C. There is a potential to work with partner organisation such as Act on Energy to deliver programme through an extended SLA (Service Level Agreement). Studies in early 2020 could be carried out with a programme to commence in 2021/22.

[11] https://www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level

The interim budget and reduction model [12] suggests a required emissions reduction of 150 ktCO2e in the domestic sector in the 20-22 period. Some will come from a decline in emissions from electricity use. The remaining reduction will have to come from reducing gas usage for space heating. This priority has been recognised and requires district wide support to improve the energy ratings of buildings most of which are in private or commercial hands.

Costs of designing in measures for a new home at the outset.	**Cost(£) – new build**	**Cost (£) – retrofit (equivalent outcome)**
Building a home with an air source heat pump and ultra-high levels of fabric efficiency (equivalent to a space heat demand of 15 kWh/m2/yr)[13]	£4,800	£26,300

A Potential Options and Targets Plan for Housing and Properties

Council 2025	**District 2030**
• Complete a re-fit review of council own properties and determine a programme of energy improvements to be funded directly through energy savings. • Install additional energy measures across Council housing stock – e.g. gas boiler replacement with heat pumps where appropriate; LED lighting to communal areas. • Extend the information and advice campaign.	• Facilitate energy efficiency measures to households in fuel poverty and support vulnerable tenants. • Invest in a re-fit scheme for council hosing stock and aim for EPC Level 'C' by 2030. • Extend campaigns to reduce household energy consumption with energy advice. • All new council housing to be built to the highest energy standards (EPC 'A' or 'B').

[12] subject to confirmation in SCATTER phase 2

[13] Curie and Brown and AECOM for the CCC (2019) The costs and benefits of tighter standards for new buildings.

Fuel poverty

Low income, high costs definition: *'A household is in fuel poverty if their income is below the poverty line (taking into account energy costs) and their energy costs are higher than is typical for their household type'.* **Note:** Government is currently consulting upon this definition

According to data from: https://www.nongasmap.org.uk/ , Warwick District Council has 62,797 residential properties of which 28.7% are non-gas properties and 11.1% of residents live in fuel poverty. Fuel poverty is caused by low incomes, high energy prices, and energy inefficient housing. Someone in fuel poverty is defined in the Warm Homes and Energy Conservation Act 2000 as "*a person [who] is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost*."

In 2014, the Government introduced in legislation (Fuel Poverty Act) a target for England to improve as many fuel-poor homes as is reasonably practicable to a minimum energy efficiency rating of Level C by the end of 2030. However, across the country this target is not being achieved at a fast enough rate. In addition, in some homes structural and damp problems may need to be sorted, before energy efficiency improvements can begin.

Improving energy efficiency of the housing stock is the most cost-effective, sustainable and long-term action to tackling fuel poverty. It also addresses carbon reduction targets, improves health and well-being and generates economic growth. A fuel poverty strategy should have as part of its objectives and targets:

- Reducing energy consumption
- Improving building fabric
- Reducing cold related illness
- Maximizing household income and reduction of household costs
- Increasing energy generated from low carbon sources.

The Government consulted on the fuel poverty definition in September 2019. The proposed updated measure would still reflect the three key drivers of fuel poverty (income, energy efficiency and fuel prices) and would still measure the number of households in fuel poverty and the fuel poverty gap. Under the proposed measure, Low Income Low Energy Efficiency (LILEE), a household would be classed as fuel poor if:

1. They are living in a property with an energy efficiency rating of Band D, E, F or G as determined by the most up-to-date Fuel Poverty Energy Efficiency Rating Methodology
2. Their disposable income (after housing costs and energy needs) would be below the poverty line.

Cold homes present a health risk to householders, and those living in fuel poverty are more likely to be affected than those who can afford to heat their home to an adequate temperature.

Transport

This sector produces greenhouse gas emissions through the combustion of fuel or use of electricity during journeys travelled by road, rail, air or water for inter-city and international travel. Principal actions reported could include, for instance:

- Checking the service and maintenance strategy to ensure vehicles or machinery operate more efficiently.
- Moving fleet from fossils fuels to electric vehicles.
- Capital investment projects to enable continuous improvement
- Behavioural change programmes

The most important role that local authorities such as Warwick District Council working in partnership with Warwickshire County Council can play is by implementing sustainable ('green') travel programmes, promoting low-carbon vehicles by rolling out electric vehicle charging infrastructure and providing incentives for drivers of low-emission vehicles including ultra-low emission buses.

Electric Vehicles

EV sales are rising steadily but they represented less than one per cent of the UK's total vehicle fleet in 2018 [14]. However, the government has committed to banning sales of new fossil-fuelled vehicles by 2040. Bringing forward this ban to 2030, and continuing to improve fuel efficiency before that date, would reduce UK oil imports by almost 50 per cent by 2035. Estimated oil cost savings could be as high as £6.63 billion annually[15]. The transport sector is now the largest source of CO2e in the country, accounting for over a quarter of emissions in 2017[16]. Road transport makes up 85 per cent of this total.

Public Transport

The Bus Services Act 2017 was introduced on 19 May 2016 in the House of Lords and received Royal Assent on April 27 2017. Essentially an enabling Act, it has the aim of improving bus services for passengers by providing local authorities, the Secretary of State and bus operators with a toolkit to enable improvements to be made to bus services in their areas. WDC is working with Warwickshire County Council to make improvements in Warwick District.

[14] https://www.gov.uk/government/statistical-data-sets/tsgb09-vehicles ; https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons

[15] Green Alliance, November 2017, UK trade in a decarbonising world. Analysis based on the assumption that the average price of a barrel of oil will be $50.

[16] Department for Business, Energy and Industrial Strategy, 6 February 2018, Final greenhouse gas emissions national statistics

Moving Forward

Electric vehicles: A WDC commitment to a 100 per cent electric fleet by 2025 would set an example and support the market. Good progress is underway with almost half the fleet now electric. The Council has also made a commitment to support public charging points to address 'range anxiety' issues.

The Council should continue their efforts working with other local councils to deliver an increased number of electric vehicle charging points across the District at new homes, places of work, council car parks and on street. The Council is currently part of a Warwickshire County Council consortium which has won funding from the Department for Transport / OLEV to install an additional 16 electric charging points in car parks across the District.

Taxis: The Council is investigating an electric taxi project which could encourage the drivers of local taxis to go electric. An ambitious taxi licensing policy including a feasibility study on all licensed taxis in the District becoming electric, zero or ultra-low emission vehicles by 2030 could be undertaken. Officer time would be needed to engage with taxi drivers and ensure planning provision is made for enabling EV charging infrastructure at selected taxi ranks.

Buses: The Council, in partnership with Warwickshire County Council, Volvo Group UK and Stagecoach Midlands applied unsuccessfully in 2018 for a grant under the Office for Low Emission Vehicles Ultra-Low Emission Bus Scheme. The grant was to bring a fully electric bus route to Leamington Spa, which includes electric buses and opportunity 'overhead' charging infrastructure. The Council plans to resubmit this bid during 2020. The cost proposal is also included within the Council's funding bid to CWLEP for Commonwealth Games 2022 support.



Charging stations: European charging company Fastned opened the UK's first 350 kW super rapid charging hub in 2019[17]. The station is located near Sunderland and uses only renewable electricity from the sun or wind. Built and operated by Fastned, the charging station is owned by the North East Joint Transport Committee, and funded through the Go Ultra Low Cities Grant and the European Regional Development Fund. Gridserve https://www.gridserve.com/ is another company that is planning to deliver a UK-wide, sustainable energy powered, affordable, public charging network akin to current petrol forecourts.

[17] https://www.zap-map.com/fastned-opens-uks-fastest-ev-charge-point/

Transport Summary

Council 2025	District 2030
• All Council pool cars, vans and maintenance vehicles to be ultra-low emissions or electric by 2025 • Reduce grey business mileage through provision of electric pool cars for staff 'general business use • Ensure ultra-low emissions are included within contracts for refuse fleet, street cleaning and grounds maintenance • Expand travel to work incentives and remote working	• Develop an expanded network of EV charge points across the District • Work with others on a 'Movement Strategy' to encourage alternative modes of travel • Require all buses and taxis to be low emissions or alternative fuels by 2030 • Examine the case for differential parking charges for low emissions vehicles in Council car parks • Promote, encourage and facilitate cycleways and bike-share schemes

Waste

Between 1990 and 2013, greenhouse gas emissions from the waste management sector across the UK decreased by 67 percent. Improvements in the standards of landfilling, changes to the amounts of biodegradable waste going to landfill and an increase in the amount of landfill gas being used for energy all contributed. Emissions of methane alone have reduced by 69 percent over the period.

Waste avoidance and material efficiency far outweigh any waste treatment for climate change benefits – even when energy is recovered. Some of the elements needed to produce the technology needed to mitigate climate change are becoming increasingly scarce, so the whole life cycle of products, including recovery must be considered.

The 2008 Waste Framework Directive (Directive 2008/98/EC). Article 3(1) defines "waste" as: - "…any substance or object which the holder discards or intends or is required to discard…". Waste and its disposal represents a cost as well as having an environmental impact. Local authorities have an important role in waste prevention and sustainable waste management through awareness raising schemes, separate collections for recycling and food waste and implementing waste to energy schemes.

As Warwick district transitions to a more sustainable society, the recycling rate will have to increase and landfill decrease even further, alongside a reduction in the total amount of household waste. This will require changes to processes and physical infrastructure, as well as behavioural changes.

The Government consultation on the Waste Strategy in 2018 including the possibility of separate food waste collections and anaerobic digestion as a treatment for food waste.

According to Defra, Local Authority waste sent to landfill has fallen by 85% since 2000. It is expected that the growth in energy from waste (EfW) and alternative residual waste treatment infrastructure will divert further waste from landfill.

The CCC Report on land use policies concluded that there should be a priority from Government for action on food waste, including a mandatory separation of food waste for collection by 2023, so that food waste can be used in other processes. The Report recommended that public sector organisations should set and monitor their own targets and improve data collection.

Current position – WDC Estate

WDC has calculated annual paper use and introduced central printer/copier systems and are working to reduce this further. Office items are recycled following the local household waste collection scheme. WDC provides information about the recycling collected, recycling ventures, garden and food waste and have a rubbish, waste and recycling page on their website.

The council does not own its own refuse trucks, so cannot count this within their own estate footprint. However, they can influence and incentivise a reduction in the district footprint through their procurement specifications, through awareness raising campaigns, by continuing to provide separate collections for recycling and food waste and through encouraging technologies such as anaerobic digestion

Current position – Warwick District

Suez, the waste contractor for WDC has given figures for the amount of waste that they collect and the carbon footprint. 45,733 metric tonnes of waste are collected providing a CO2e of 843.63 tonnes. 95% of the collection CO2 is from the use of diesel fuel.

WRAP[18] collates tables relating to the UK, local authority region, Office for National Statistics (ONS) area group and Urban-Rural Index of Multiple Deprivation (IMD) classification. This comparison could indicate areas for action. Government statistics[19] also provide comparisons of the Kg CO2e for local authority collected waste by treatment across the WDC area.

Moving Forward

Taking a 'circular' approach to the economy assists by designing out waste and pollution, keeping products and materials in use as long as is possible. Reduction, re-use, and recycling of waste, can provide economic opportunities. The Council can facilitate links between companies that can use one another's waste as a resource.

[18] https://laportal.wrap.org.uk/Benchmarks.aspx
[19] Department for Environment, Food and Rural Affairs, 2017

Waste – key activities

- Continue to measure the waste produced so that it can be reduced and managed sustainably.
- Reduce printing and paper waste through increase in digital systems and services.
- Provide district wide advice and information services to avoid waste and contamination.
- Engage the public, communities and businesses through behavioural change initiatives to provide a greater understanding of waste issues and best practices to reduce the volume of waste produced.
- Continue to promote initiatives to reduce waste across the district, such as Love Food, Hate Waste, #Refill and #Longlivethelunchbox campaigns, alongside increasing water fountains across the city to reduce single use plastic waste.
- Explore developing repair and reuse facilities, workshops and skill sharing across the city to explore the reuse of unwanted but serviceable item.
- Continue to work towards the Council's commitment to become single use plastic free.
- Reduce food waste and link all remaining food waste to energy, composting or other circular economy uses
- Investigate using food waste for anaerobic digestion to provide energy as an alternative to Energy from Waste and developing a plan for kerbside food collection in line with the national strategy.
- Investigate ways to eliminate the remaining waste going to landfill and implement into council policy

Water – key activities

- Water saving technology could be installed within all commercial buildings within the Warwick District Council portfolio. This could include water outlet rationalisation adaptors to taps and showers and water pressure regulating systems.
- There is potential for a rain water harvesting system including treatment to be installed across the commercial sites within the Warwick District Council portfolio.
- Work with water supply companies to help identify water leaks.
- Work with partners to understand how Green and Blue infrastructure can be better used to manage water
- Provide information to citizens and businesses on the best practices to reduce water consumption, helping to improve understanding of the issues and solutions to better water management, reducing bills and carbon emissions

Energy Policy

The Council should have a vision of how the energy system would ideally look to align energy development and secure funding. Options to explore include support for external investment in local and community renewable energy schemes including solar farms. Low carbon energy must be affordable and accessible to all.

Case Study: Warrington Borough Council has completed a deal with a sustainable energy company to create two solar farms. With a combined capacity of 62MW, the farms in Hull and York will help make the council the first UK-based local authority to generate all of its own energy and it is estimated that it will cut bills by up to £2m a year. The council estimates that the schemes – once fully operational – will generate enough clean power to supply more than 18,000 homes and mitigate the emission of 25,000 tonnes of carbon every year.

The Council could work with WCC and other partners on a potential capital investment. There is potential to work with neighbouring authorities and partner organisations to deliver a draft Plan by Autumn 2020. Decarbonising energy across the District is a key challenge and therefore consideration should be given to initiatives that will increase the use of these technologies across the District. This could include the Council facilitating a 'bulk buy' scheme for residents to access solar panels or other technologies. This could be modelled on the 'reverse auction' scheme run by Norwich City Council and other local authorities in Norfolk.

Renewable energy

Energy is a key concern for many councils considering their Climate Change Strategy and an energy strategy is part of the long-term strategic planning process. In recent years, a number of councils have invested significantly in renewable generation working with local generators, including community not for profit groups, and/or have formed long-term agreements to purchase their electricity.

Investment in utility-scale solar power generation

WDC has engaged with solar park specialists Lightsource BP to determine the preliminary viability of investing in a 6MW solar park adjacent to the M40 near Bishops Itchington. The proposal represents a considerable investment by the Council dependent upon which financing model is approved. This would provide the Council as a major off-taker of power in the District to provide green energy to their own estate and to local commercial and residential consumers. Whilst this carries a degree of financial risk it also presents a significant revenue opportunity – and through the generation of green renewable energy, would make a significant contribution to the reduction of CO2e within the District.

Investment in building mounted solar power and heat pumps on Council-owned buildings (non-residential)

WDC could invest in roof-mounted solar PV systems on several of their public buildings. Those buildings with a significant daily usage of electricity would benefit most as it would provide green energy at point of use equivalent – at a cheaper price per kWh than from its supplier tariffs. Battery storage options could be considered to maximise on-site use of solar power – although the costs of battery assisted systems need careful 'best value' analysis. Solar power from public buildings could provide EV charging for visitors either on site or nearby.

Heat pumps (air, ground or water source) will increasingly offer a realistic and lower CO2e emission alternative to fossil-fuel powered heat systems (gas or electric). WDC has contracted Midlands Energy Hub to assess the options for energy saving and efficiency on six main public buildings within the Council's estate. They will be reporting back in early March 2020. The inclusion of heat pumps especially within those buildings requiring upgrades to their heating systems will be a main consideration.

Installation of solar power and heat pumps in council homes

The Council is already engaged in a programme of retro-fit upgrades to council homes (houses and flats) to replace either electric-powered energy systems or to phase out gas heating. The installation of solar PV, solar thermal and air source heat pumps will reduce the energy costs for householders whilst reducing the CO2e footprint.

Current position – household solar PV

The Feed-in Tariff scheme ended on 31st March 2019. The Government statistics for PV installations in the WDC area to the end of March 2019 showed that there were:

Number of households	61,977
Total domestic PV	1849
Installations per 10,000 houses	298
Total domestic and non-domestic PV	1928
Total domestic PV 2010 - 2014	1266

Moving Forward:

Council 2025	District 2030
• Complete a 'Re-Fit' review of Council properties and determine a programme of energy improvements to be funded directly through energy savings. • Extend pilot scheme to test alternative new council home construction. • Install additional energy measures across Council housing stock e.g. gas boiler replacement with heat pumps; LED lighting to communal areas. • Extend information and advice campaign to all Council tenants.	• Facilitate energy efficiencies in those households in fuel poverty and support vulnerable tenants. • Invest in a 'Re-Fit' scheme for council housing stock and aim for all to be EPC Level 'C' by 2030. • Extend campaigns to reduce household energy consumption with energy advice. • Encourage / ensure all new housing to be built to the highest energy standards (EPC 'A' or 'B').

Community Energy Investment:

'PowerPaired' is an online platform which provides a matchmaking service to bring together community energy groups and the owners of sites with potential for renewable energy generation. The aim is to increase the number of community owned renewable energy projects in the UK – helping communities to take control of the way their energy is generated, saving money and tackling climate change at the same time – by making it as easy as possible for projects to get off the ground. A partner is Pure Leapfrog who provide assistance around many common obstacles, such as providing legal templates and other vital resources for asset owners and community energy groups.

Community for Renewables (CfR) helps communities set up local community energy enterprises and supports them to develop, finance and manage their own renewable energy generation. One local example of their partnership and support is with the Heart of England Community Energy community benefit society with a 16MW solar park array located at Drayton Farm on the outskirts of Stratford upon Avon

Planning

Spatial planning can make a major contribution to tackling climate change by delivering the right development in the right place that integrate the principles of sustainable design and construction. Effective local and strategic plans can help to deliver a range of key solutions as well as meeting the aspirations of local residents and protecting them from the negative impacts of climate change.

The Climate Change Act 2008 contains a statutory target of securing a reduction CO2e levels of 80% below 1990 levels by 2050, with an interim target of a 34% reduction by 2020. Section 182 of the Planning Act 2008 introduced a duty on local planning authorities to include policies that contribute to both climate change mitigation and adaptation in their plans. This sets a clear legal framework for the role of planning and local policy in responding to climate change.

Under the provisions of the Climate Change Act 2008 and the revised National Planning Policy Framework (NPPF), local plans must set a carbon dioxide emissions reduction target and clear ways to measure progress. The RTPI and TCPA have clarified the scope of planning authorities to set ambitious targets on energy efficiency (beyond Building Regulations) and that requirement for on-site renewable energy generation is possible.

'The current National Planning Policy Framework contains strong policy on climate change, but delivery on the ground through local plans has been relatively poor. Local plans in England are not dealing with carbon dioxide emissions reduction effectively, nor are they consistently

delivering the adaptation actions necessary to secure the long-term resilience of local communities'[20].

The RTPI and TCPA partly attribute the inaction to a lack of resources in local government, but also to changes in Government policy, such as the cancellation of the zero-carbon commitment and the Code for Sustainable Homes.

Buildings are responsible for almost half of the UK's carbon emissions, half of the water consumption, about one third of landfill waste and one quarter of all raw materials used in the economy[21]. The construction industry has an important role to play in delivering sustainable development.

Sustainable design and construction takes account of the resources used in construction, the environmental, social and economic impacts of the construction process itself and the design and future use of buildings. The co-benefits include the responsible and prudent use of resources, lower fuel bills, improved health and economic benefit.

Council 2025	District 2030
Use S106, CIL (IFS) along with external grants to match fund carbon neutral initiatives.	• Ensure that green open spaces are part of the design of new housing and regeneration development. • Ensure that carbon reduction features and BREEAM Excellent standards are included in major development schemes.

Other services

Procurement and CO_{2e}

The procurement of goods, works and services contributes to carbon emissions. Consideration of the embedded energy, fuel and water costs of the products, services, and refurbishment and construction projects procured reflects best practice. WDC has a Sustainability Procurement Policy, which considers the key issues related to Climate Change and the environment. Environmental issues can be incorporated across the procurement process at all levels to identify the key policy updates required.

[20] Planning for Climate Change, A Guide for Local Authorities, RTPI/TCPA May **2018**
[21] BEIS Statistics

A recent internal study carried out by the Council has produced some important proposals, which include suggestions to support the development of skills and resources to ensure that suppliers and the supply chain are able to deliver net zero carbon.

The Study suggest that a review of contract management and commissioning and of the Procurement Strategy for the Council should be brought forward to support the Council's Carbon Management Plan.

Introducing sustainable procurement could include:

- embedding innovation, climate change and the environmental impacts of the Circular Economy at every stage of the procurement process.
- including relevant environmental key performance indicators (KPIs) as part of the assessment process and the contracts
- implementing systems for monitoring and evaluating environmental objectives
- ensuring broader procurement resources (commissioning and contract management) are in place; and monitoring procedures are cohesive across the Council and present for relevant contracts
- including value for money assessment to take account of Corporate Social Responsibility including environmental impact and co-benefits e.g. CO2e reduction, health, economy, equity and resilience
- sharing with strategic partners (e.g. other councils, public sector bodies, private environmental bodies) the procurement responses to climate change
- engaging with strategic suppliers (e.g. waste collection, grounds maintenance, leisure centres) to raise awareness of the Council's strategic objectives for net zero by 2025
- engaging and influencing suppliers and supporting innovation and solutions to help meet future sustainability requirements
- including environment and climate change within Procurement Policies and Guidance

Moving forward:

A growing number of authorities are looking towards renewable energy purchasing. Contracts such as Power Purchase Agreements (PPA) are being used. A PPA is a long-term purchasing contract with a developer which gives the developer confidence to build renewable energy plant and can also be used to support community energy.

Air quality management:

Activities lead to the emission of a wide range of gases and small particles into the atmosphere which affect the quality of the air we breathe, and hence health and that of ecosystems. Some emissions, carbon dioxide for example, are causing the climate to change.

Air quality pollutants generally stay in the atmosphere for days or weeks. Their effects are mainly felt locally, so policies for air quality are based on local and regional measures. By contrast, carbon dioxide has a lifetime of about 150 years and methane about 12 years. There is clearly a close relationship between air quality and climate change pollutants.

Measures to improve air quality can be grouped under the following headings[22]:

- Conservation – reducing the use of resources through energy conservation, for example by improving the insulation in houses.
- Efficiency – carrying out the same activity, but doing so more efficiently, and so reducing the use of resources and emissions of air quality and climate active pollutants, for example by improving the efficiency of car engines.
- Fuel switching – substituting a higher emission fuel with a lower emission fuel; the switch from coal to natural gas in power stations led to significant reductions in carbon dioxide emissions.
- Demand management – implementation of policies or measures which serve to control or influence demand, for example the congestion charge in central London.
- Behavioural change – changes in the habits of individuals or organisations that result in reduced emissions, for example travelling by train instead of by air.

Building control – enforcement of standards on energy efficiency

Bristol has adopted long-term development plans that require carbon savings above building regulations to the maximum 19% allowed, by requiring renewable energy generation above and beyond that figure. A recent report[23] on building regulations stated that the way new homes are built and existing homes retrofitted often falls short of stated design standards and that Local Authority Building Control should be given a re-focused role in overseeing standards and duty holders' key responsibilities during design and construction.

Moving Forward

The CCC[24] has also called for an update to building regulations beyond those currently being proposed by Government. The Council should consider supporting this call.

[22] laqm.defra.gov.uk/assets/summary.pdf. Air Quality and Climate Change: A UK Perspective - Summary
[23] Building a Safer Future – Independent Review of Building Regulations and Fire Safety: Final Report
[24] UK Housing: Fit for the Future. Committee on Climate Change 2019

Infrastructure/ Economy

Future infrastructure has to be resilient to the risks from future climate change. This requires consideration of the likely future impacts. Climate change is expected to increase the frequency and severity of extreme weather including both high and low rainfall, and heatwaves. Flooding is one of the most significant civil emergency risks faced in UK[25] and climate change is a key driver, alongside population and development, of increasing flood risk in the UK. The Committee on Climate Change puts flooding from all sources as the most significant risk to UK infrastructure across all of the sectors considered within the NIA.[26]

The National Infrastructure Commission[27] has identified the natural environment as a major driver of infrastructure demand and supply to reflect both the need to adapt to the changing climate and to protect and enhance the environment (and the services it provides) from the impact of detrimental human activities. The Natural Capital Committee published a review of natural asset status and trends in 2014.

The Stern Review in 2006 concluded that climate change is likely to have major impacts on economic growth towards the end of the 21st Century. In addition, the Committee on Climate Change has suggested[28] that priority areas for the National Infrastructure Assessment (NIA) are smart low-carbon power, electric vehicle charging networks, heating, carbon capture and storage, flood risk management & drainage, and water resources management & supply. The requirement to cut UK greenhouse gas emissions will have a significant impact on infrastructure well within the time period considered for the NIA.

Business and Local Economy – District 2030
• Continue to encourage and expand inward investment and relocation of innovative low carbon technology such as energy and transport. • Work with businesses and corporate organisations on Circular Economy initiatives. • Ensure that infrastructure is resilient to the risks of Climate Change.

[25] National Risk Register of Civil Emergencies 2015 edition - see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/419549/20150331_2015-NRR-WA_Final.pdf

[26] Dawson, R.J., Thompson, D., Johns, D., Gosling, S., Chapman, L., Darch, G., Watson, G., Powrie, W., Bell, S., Paulson, K., Hughes, P., and Wood, R. (2016) UK Climate Change Risk Assessment Evidence Report: Chapter 4, Infrastructure. Report prepared for the Adaptation Sub-Committee of the Committee on Climate Change, London.

[27] The impact of the environment and climate change on future infrastructure supply and demand, National Infrastructure Commission report 2017

[28] Committee on Climate Change (2017) Letter: the infrastructure needs of a low-carbon economy prepared for climate change - see https://www.theccc.org.uk/publication/letter-the-infrastructure-needs-of-a-low-carbon-economy-prepared-for-climate-change/

Biodiversity

Biodiversity is declining in the UK. There is increasing research evidence of its importance and the factors that are driving the decline including land use practices, pollution, deforestation, habitat fragmentation, over-consumption of resources and climate change. The benefits are recognised as important for our wellbeing through cleaner air and recreational benefits.

> "An estimated 1.4 billion kg of air pollutants were removed by natural vegetation in 2015 – saving a potential £1 billion in avoided health costs." (Air Quality Expert Group, 2018)

Warwick District Council carried out a Green Infrastructure Study in February in 2012 as part of the Local Plan. The Study recognised that enhancements to the GI network would deliver benefit for residents including access to nature, climate change adaptation and flood management. The Council supports the Local Biodiversity Action Plan.

The Council can:

- identify biodiversity features and impacts on landholdings controlled by the organisation (including any high value environmental assets e.g. woodland, rivers);
- establish the proximity of sites to important wildlife features,
- and explore opportunities for including biodiversity features in buildings and landholdings (green roofs, ponds, trees, wildlife gardens) that can offer a range of benefits including habitat creation, green corridors, recreation/amenity, solar shading, positive public perception, rain water/ flood attenuation);

Biodiversity Net Gain

In 2019 Defra consulted on whether the government should introduce mandatory requirements to the planning system in England so that development must delivery biodiversity net gain. The RTPI responded[29] to the consultation that development should support habitat conservation and enhancement, and deliver net gains for diversity. However, they also reported that this must be complemented with proper resourcing for planners, including access to ecological expertise. The RTPI has worked with the Partnership for Biodiversity in Planning to publish practice advice on 'Biodiversity in planning: Obligations and opportunities to promote biodiversity through the UK planning systems'[30].

[29] https://www.rtpi.org.uk/knowledge/consultations/2019-responses/rtpi-response-to-defra-consultation-on-biodiversity-net-gain/
[30] https://www.rtpi.org.uk/media/3560735/biodiversityinplanningpracticeadvice2019.pdf

Green infrastructure offers important well-being outcomes, directly contributing to people's health and quality of life. It also contributes to flood mitigation and adaptation, improved air quality and increased biodiversity. New and improved infrastructure is likely to be needed to cope with more severe flooding and droughts, as well as new hazards such as an increase in extreme temperatures.

Council 2025	District 2030
• Deliver a 5-year tree planting programme on Council owned land • Use Council owned land to increase biodiversity and adjust mowing regimes	• Work with EA, WCC, business organisations and community groups to develop flood mitigation measures and tree planting schemes across the district

Adaptation and Mitigation

There are two main policy responses to climate change: mitigation and adaptation. Mitigation addresses the root causes, by reducing greenhouse gas emission, whilst adaptation seeks to lower the risks posed by the consequences of climate change. It is important for local government to implement adaptation actions within the range of services it delivers.

Warwick District is already experiencing a range of climate impacts, including heat waves and flooding, but in the future these are expected to become more frequent and severe, alongside a likely increase in water shortages, food shortages and decreased urban biodiversity.

Adaptation refers to actions that reduce vulnerability to climate change impacts, reducing its effect on social, economic and natural systems, whilst, resilience refers to the ability of a system and its components to anticipate, absorb and recover from effects of an event in an efficient and timely manner. Both adaptation and resilience are especially important when taking action against future climate change and must be considered alongside actions to reduce carbon emissions.

Even with strong action on mitigation, some degree of change is inevitable. Inertia in the climate system will mean that the climate will change over the next 30 years regardless of any carbon reduction work. Even with urgent greenhouse gas emissions reductions, scientists expect that the world will face rising temperatures and, in many places, increasingly frequent and severe weather impacts due to climate change (such as floods, droughts, heatwaves and other extreme events).

Forward planning rather than reacting to extreme weather events as they occur is essential. This process of adjusting to changes in our climate adaptation should be part of any long-term business strategy by WDC to implement adaptation policies alongside carbon reduction work. Long term planning is required and the council has a strong role to play.

Guidance from the Town and Country Planning Association and Royal Town Planning Institute[31] recommends that "climate adaptation must be understood as the main priority for long-term planning to secure climate resilience, and must be accepted as equally as important as meeting housing need." Adaptation will be more difficult to monitor, evaluate and plan than mitigation measures. However, several reports and framework models exist:

- The IPCC Special Report (Summary for Policymakers) of 2018 outlined a range of adaptation options available.
- A report on Adaptation Actions in Cities produced by the CCC[32], emphasised the need to be clear on monitoring the impacts of actions, the need for realistic timescales for development and delivery and that projects should clearly identify where taking action can support multiple benefits.
- The CCC highlighted the role of local authorities in adaptation in their 2012 report[33] and emphasised that land use planning is one of the most important functions of local government that can deliver resilience and adaptation measures. Local authorities have a key role in ensuring new buildings are climate change resilient.
- The ADEPT Report[34] also outlined the local government role in adaptation.

Significant areas of Warwickshire are already subject to flood risk[35] and the expectation is that global warming will lead to more extreme rainfall. Local government can use land planning to minimise flood risk, plan and deliver green infrastructure.

The Council:

- Land and Planning polices documents should include adaption for heatwaves and floods
- Integrate adaptation thoroughly into the Climate Change Strategy
- Reduce the number of homes and businesses that are exposed to flood risk
- Acknowledge flood risk and flood management in all new developments in high flood risk areas.

In partnership:

- Work with partners and organisations to conduct in depth flood risk mapping
- Ensure Emergency Plans are adapted to reflect the changing risk

[31] Planning for Climate Change: A Guide for Local Authorities – TCPA/RTPI, May 2018
[32] Adaptation actions in cities:what works? CCC, August 2018
[33] How local authorities can reduce emissions and manage climate risk, CCC 2012
[34] Good practice guidance for Local Government, ADEPT, June 201
[35] WCC Local Flood Risk Analysis

- Improve knowledge and understanding of how the Council is affected by extreme weather events in terms of providing its services and its financial impact
- Work with partners and other local authorities to help evaluate and develop suitable tools to help understand impacts to council service areas
- Understand the current and future impacts of extreme weather events and climate change, with an in-depth knowledge of the most vulnerable citizens
- Work with citizens to ensure those most vulnerable and at high risk to severe weather events are on the priority service register and have signed up to alerts (e.g. flood risk alerts)
- Work with businesses to help them develop business continuity plans in response to climate change and extreme weather events.

Funding Climate Actions

Implementing climate change actions and measures has a cost as well as many benefits. Sourcing of funding to deliver the climate actions plans for Warwick District Council's own estate and to support the transition across Warwick District will require careful but deliberate allocation of funds – whether these be from capital and revenue budgets, from local taxation or from external grants. There are a number of local authorities that have developed climate / carbon action funding schemes to initiate, pump prime and deliver actions against which CO2e reductions and economic efficiencies can be measured – along with other less quantifiable social and environmental outcomes. Use of legal and planning mechanisms such as Section 106 agreements, Community Infrastructure Levy, Infrastructure Funding Statements (IFS) and other mechanisms should be considered to fund climate actions and nature restoration projects.

Case Study: Climate Change Fund

The Cambridge Climate Change Fund was established in 2008 to fund measures that will reduce the carbon footprint of the Council's own buildings, fleet and services. A total of £1,583,820 has been invested in the Climate Change Fund since 2008/09. This includes a total of £250,000 added to the fund in 2018/19 and £100,000 in 2019/20. The Climate Change Fund provides 'ring fenced' support to projects that help to reduce the Council's own carbon emissions and/or manage climate change risks to Council staff and property.

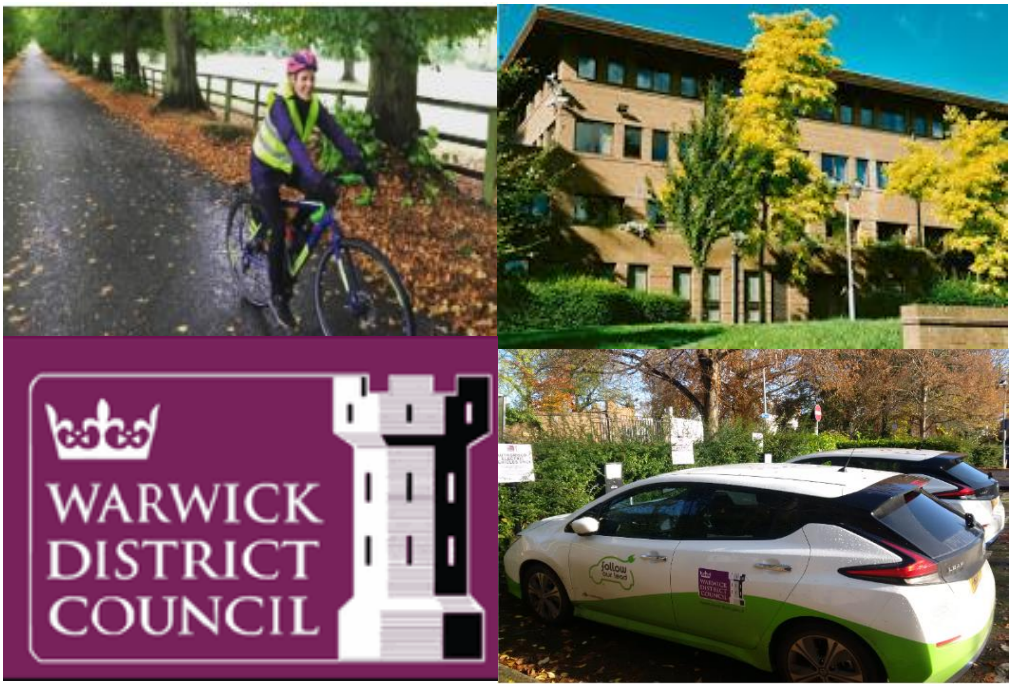
Case Study: Community Climate Change Grant Fund

Plans to give grants to South Cambridgeshire communities to spend on ambitious projects as they shift towards a zero-carbon future have been agreed by the District Council. The aim of the Zero Carbon Communities grant scheme is to provide funds for local groups to spend on activities that reduce carbon emissions and reliance on fossil fuels. The scheme aims to help communities spread awareness and promote behaviour change towards low carbon lifestyles. Community groups will be invited to bid for grants of between £1,000 and £15,000 each.

These funds will be awarded to projects such as: energy-saving improvements to community buildings; Community energy projects; electric vehicle charging points; purchase of EVs for community use; community tree planting; community schemes to scale up local circular economy initiatives; cycle paths and stands; projects that tackle fuel poverty; simple proposals such as cycle racks at bus stops or drinking fountains.

A total of just over £90,000 is being made available for the scheme for 2019/20. The money comes from business rates from renewable energy sites in South Cambridgeshire that are retained by the Council and earmarked for use in green initiatives.

A Carbon Management Plan for Warwick District Council (Work Package 2)

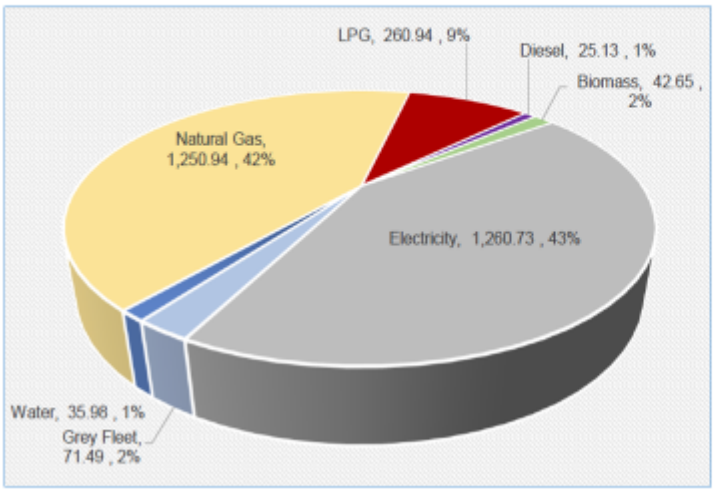


Section 1 – Warwick District Council Carbon Baselines

As part of its carbon management strategy, in 2019 Warwick District Council contracted One Carbon World to prepare a baseline carbon footprint analysis of the Council's own estate and operations. One Carbon World is a global resource partner of the United Nations Climate Neutral Now initiative and a not for profit organisation. They are recognised for offering advice and support on measuring and reducing greenhouse gas emissions around the world. The study completed in October 2019 did not take account of council-owned homes nor air conditioning and waste emissions.

WDC Organisation Carbon Footprint

Sources of CO2 by emission activity (tonnes)



Asset	tonnes CO2e	%
Electricity	1260.73	43%
Natural Gas	1250.94	42%
LPG	260.94	9%
Grey Fleet	71.49	2%
Biomass	42.65	2%
Water	35.98	1%

2,948 tonnes CO2e excludes social housing, aircon, waste emissions

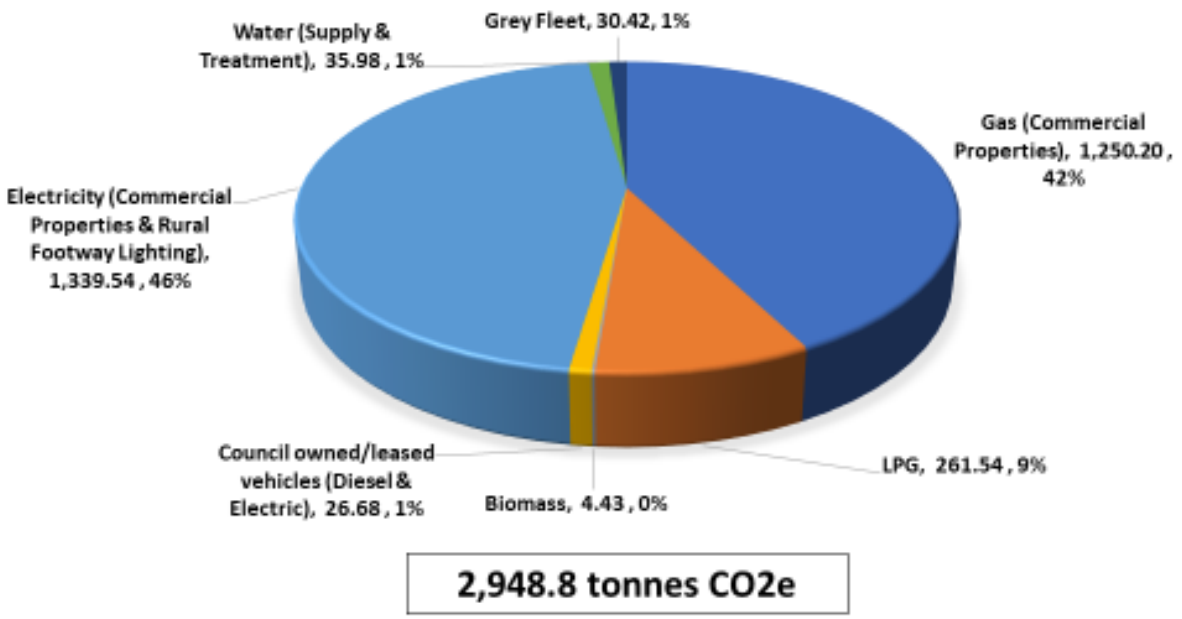
Refreshing the Carbon Baseline

The One Carbon World (OCW) review used energy data provided by WDC to prepare the above carbon footprint for the organisation. Electricity and natural gas usage data reflects only the non-domestic properties that WDC own – including several public buildings and carparks that are high energy users. The LPG is allocated for crematorium only.

As part of the Carbon Management Plan, the Consultants carried out a 'refresh' of the OCW baseline – but still with waste contract and council homes emissions excluded as considered 'out of scope' and instead to be included within the Warwick District carbon footprint and Roadmap (WP3). However a review of the potential for CO2e reduction as a result of carbon reduction measures within the Council's housing stock has been included within this Annex.

The pie chart below was created from data provided by WDC and confirms the estimated CO2e emissions from the Council's estate buildings and fleet as 2,948 tonnes.

Refreshed Council CO2e Footprint



Section 2 - Carbon Management Plan methodology

A Carbon Management Plan is required by the Council to meet the net zero target by 2025. Development of this Plan has involved an assessment of the current situation within the Council's estate, and build upon the current actions and proposals that are already being implemented or being considered across the Council's estate. Discussions with the Sustainability Officer Group (SOG) and support from the Council's Asset Management Team have formed an essential background to this work.

The Consultants have confirmed the current carbon emissions baseline and calculated (using Defra conversion factors) the CO2e savings that will accrue from measures proposed which are considered to be realistic and achievable. The study includes estimated costs of implementing the various actions and assessed the likely energy/fuel savings that should result. A timeframe of programme delivery and a carbon reduction profile has been constructed. The WDC Carbon Management Plan detailed below is made up of a series of Carbon Reduction Measures (CRMs) which could be delivered in stages over the next five years.

On the assumption that Year 1 = 2020-21, these are clustered as follows:

- Stage 1 – Immediate Actions/ Measures (Year 1)
- Stage 2 – Technology Actions / Measures (Year 2 & Year 3)
- Stage 3 – Renewable Energy Generation (Year 4 & Year 5)
- Stage 4 - Carbon Offsetting (Year 5) – if required

The additional Stage 4 is added during Year 5 to represent any shortfall in carbon reduction following completion of measures - and the cost of offsetting this shortfall. However it will be noticed within the carbon reduction / descent graph below, that only a minimal shortfall is projected - one that can be easily offset locally e.g. through tree planting on Council land.

The delivery of the Council's Carbon Management Plan will be affected by several factors e.g. staff resource, budget availability, prioritisation of actions and beneficiary groups, external investment and delivery partnerships. These factors and decisions lie outside of the domain of the Consultants and will be generated from joint discussions between council officers, councillors and contractors over the next few months.

Note: Consultants have not had the opportunity nor been tasked to carry out any building, energy or resource surveys; as such, these CRMs are based upon data provided and available and information extrapolated from other case studies and the Consultants' experience. They should be regarded as estimates therefore and will require more detailed investigation.

Summary of Key Carbon Reduction Measures (CRM)

The Carbon Reduction Measures listed below and detailed later in this Annex have been broken down into a phased delivery programme – to be confirmed following budgetary and resource decisions by the Council.

Key Area	CRM	Measure	Timescale
Warwick District Council Energy and Buildings (non-residential)	1	Data System	Stage 1 – Year 1
	2	REGO Green Energy Procurement	Stage 1 – Year 1
	3	Energy Audits & Low Cost/ No Cost Measures	Stage 1 – Year 1
	4	Lighting Rural Footways/ Cycleways	Stage 1 – Year 1
	5	LED Lighting Upgrade - Carparks	Stage 1 – Year 1
	6	Heat Pump/ Air Conditioning Rationalisation	Stage 2 – Year 2 – 3
	7	Building Thermal Improvements	Stage 2 – Year 2 - 3
	8	Royal Spa Centre Solar PV	Stage 3 – Year 3 -4
	9	Solar PV WDC Public Buildings	Stage 3 – Year 3 -4
	10	Air Source Heat Pumps	Stage 3 – Year 3 -4
	11	Lighting Rural Footpaths (Off-Grid)	Stage 3 – Year 3 -4
	12	Carbon Offsetting	Stage 4 – Year 5 (If Required)
Water	1	Water Management Awareness Campaign	Stage 1 – Year 1
	2	Water Management Technology	Stage 2 – Year 3
	3	Water Management Renewables	Stage 3 – Year 4 – 5
Transport	1	Upgrade WDC fleet to electric vehicles	Stage 1 - Year 1 – 3
	2	Introduce Electric Pool Car	Stage 1 - Year 1

A Carbon Descent Profile

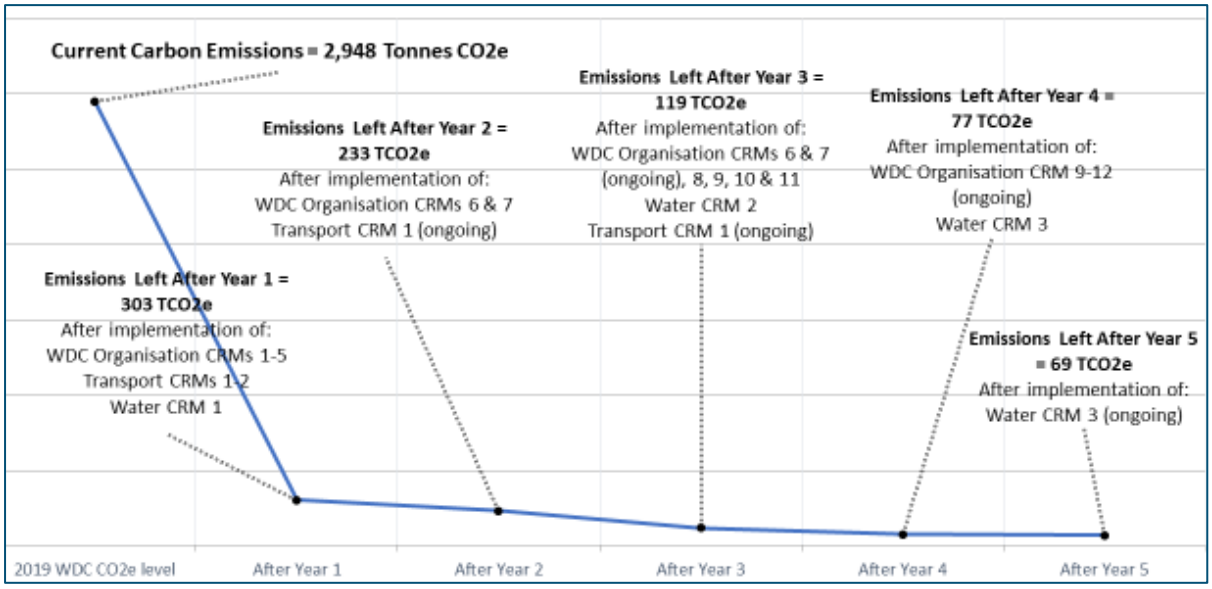
The proposals for a phased delivery of CRMs enables a carbon descent profile to be created. The carbon 'descent' graph below reflects one of the scenarios examined by the Consultants

(WDC energy, water and transport fuel emissions) and is outlined below. It identifies the milestones that can be planned and plots the likely level of CO2e emissions saved by the Council along that 5-year profile.

The decisions taken when to actually fund and implement the measures will impact upon the speed of carbon reduction over the 5-year carbon management programme. Additionally, measures listed could be expanded e.g. solar PV on council-owned public buildings or new measures introduced.

Note: Alternative carbon reduction (descent) scenarios were considered which included council homes improvements, solar park investment project and waste collection emissions. However it was felt that these were all 'out of scope' for the Council's own footprint – and should be included within the broader Warwick District carbon footprint (Work Package 3).

A carbon descent profile for Warwick District Council's own carbon emissions is presented below and excludes emissions from council homes refit, waste and solar park):



It should be noted that the carbon descent graph shows that net zero is almost achieved by 2025 as a result of the actions taken. A small level of CO2e emissions of around 69 tonnes remains but this can be managed towards the end of the five-year period using local offsetting projects e.g. tree planting on the Council's own land.

Section 3 – Energy and buildings (non-residential)

The Council's own carbon footprint is heavily influenced by the energy usage within the Council's own estate – public buildings, public realm, communal residential areas, green spaces and car parks.

As a major property owner, Warwick District Council has the opportunity to reduce both energy costs and CO2e emissions across its estate by delivering a carbon management plan which implements a series of energy saving or renewable energy generation activities.

It is acknowledged that many of these measures are either under way or at investigation and/or development stage. The purpose of this Carbon Management Plan has been to confirm the status of actions, collate data from WDC investigations and reports, propose actions, confirm/estimate costs of actions where possible and appropriate, and calculate CO2e savings as a result of actions.

Energy Hierarchy

The Council's energy hierarchy priorities could be regarded as:

1. Reduce on-site energy use (includes behaviour change);
2. Reduce energy losses by retro-fit energy technologies e.g. heating controls; lighting and use of more energy efficient building fabric;
3. Source / generate energy from renewable resources and use within host buildings.

Note: Uncertainty related to timing of the new HQ building means that for the purposes of this Report it is assumes that the Council's offices will remain at Riverside House.

Public Buildings

Warwick District Council owns several public buildings that have high annual energy use. WDC Asset Team already has as an objective a target to reduce total energy costs by £35k pa across the WDC Estate. Midlands Energy Hub (Nottingham City Council) has been contracted to carry out an energy review of the six main energy intensive buildings.

Excluding the rather specialist energy profiles of the Crematorium (LPG) and the Temperate House (Jephson Gardens) the other four buildings listed below represent 31% of the Council's total estate gas and electricity bill (WDC 2018-19 energy data). Of these, the electricity usage in Riverside House is significant – and will be one of the benefits of relocation.

WDC Building	DEC rating	DEC validity	Area m2	Gas kWh pa	% total Estate	Elec kWh pa	% total estate
Royal Pump Rooms	E	2015	4493	710476	10%	400522	9%
Leam Town Hall	D	2019	2325	262992	4%	140554	3%
Riverside House	D	2019	7362	460389	7%	621457	14%
Royal Spa Centre	B	2019	2890	670731	10%	224663	5%
4 Buildings total kWh				2104588		1387196	
WDC Estate total kWh				**6800091**		**4453779**	
% of total estate					**31%**		**31%**

Results of the Midlands Energy Hub survey (March 2020) should clearly identify the current efficiency of each building. The Review will propose structural and technology measures designed to improve energy efficiency and reduce the Council's energy bill. Such measures will also reduce the Council's carbon footprint – and contribute towards reaching the net-zero target of 2025.

Section 4 – carbon reduction measures

The tables below provide a useful breakdown of the Carbon Reduction Measures proposed to cover Council-owned public buildings, estate, water resource and council transport fleet.

Summary of WDC Carbon Management Plan

Stage 1 – Immediate Actions/ Measures (Year 1)	**Key Measures include**: Data Management System, Building Energy Audits, Identified No Cost/ Low Cost Measures, Sub-Metering, Green Energy tariffs, LED **Total Investment**= £848,563 **Carbon Reduction**= 2,637.4 TCO_2e
Stage 2 – Technology Actions / Measures (Year 2 & Year 3)	**Key Measures include**: Low Carbon Technology measures and building thermal improvement i.e. heat pumps, thermal insulation; water technology; EV fleet **Total Investment**= £390,000 **Carbon Reduction**=124.6 TCO_2e
Stage 3 – Renewable Energy Generation (Year 4 & Year 5)	**Key Measures include**: Solar PV, Air Source Heat Pumps; water management **Total Investment**= £1,730,000 **Carbon Reduction**= 83.2 TCO_2e
Stage 4 - Carbon Offsetting (Year 5 – If Required)	**Key Measures include**: Offsetting Remaining Carbon Emissions **Total Investment**= £1,035 **Carbon Reduction**= 69 TCO_2e

These Key Measures spread over a 5-year implementation period represent the potential capital investment for the Council and the likely savings in terms of energy and CO2e to deliver this Carbon Management Plan over the four key stages listed above.

Total Cost of Investment	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£2,969,598	4,150,574 kWh	£420,556	2914.2	7.1

Notes: Further measures could be introduced with the impact of making further energy and carbon reductions up to and beyond 2025. These calculations must be regarded as an estimate and subject to site reviews, cost proposals and procurement requirements.

Analysis of Stages - Stage 1 – Immediate Actions and Measures (Yr 1)

Stage 1 CRM 1: Implement a Data Reporting System

Given the difficulties experienced in collecting the required data it is recommended that a data and carbon footprint management system be implemented. This will enable the systematic recording of WDC Carbon Footprint capturing all elements to include energy, waste, water, transport and residential. It is recommended that this platform be utilised to produce comprehensive reporting, identify key areas of improvement and provide the basis of a structured carbon management programme.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£25,000	562,694 kWh	£37,977	617.5	0.7

Calculations: Energy savings calculations are based on a 5% energy reduction across the Council's estate portfolio – this is an estimate taken from the Consultant's experience of implementing data and carbon management systems. The capital costs have been calculated from similar projects carried out and as such should be regarded as an estimate. Carbon emissions savings are calculated using DEFRA 2019 conversion figures.

Stage 1 CRM 2: Green Energy Procurement

WDC has the opportunity to switch from its existing electricity tariff which contains 47% of certified green energy onto a 100% green energy tariff. The Asset Management Team are already in discussions with their current supplier Total Gas and Power to negotiate this change (December 2019).

A recent response from TGP reads as follows:
"If WDC were to take 100% UK generated green electricity (hydro, solar, wind – no biomass) the additional premium on to the Council's existing cost of electricity would be in the region of £2,970 per annum. This is based on a consumption of 3,711,482 kWh per annum at a green premium of 0.08p/kWh. This is the current market cost of Green Electricity (REGO Certificate)" Total Gas and Power 16.10.19

Capital Cost (£) (100% contract)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£3,563	0 kWh	£0	1,235	N/A

Notes: It is important to ensure that green energy offered by the supplier is actually sourced from renewables or through purchase and retiring of Renewable Energy Guarantees of Origin (REGOs certificates). It will also be necessary to confirm the supplier's process for green energy has been independently audited.

Defra CO2e conversion 2019 = 0.2556kg CO2e / kWh electricity. Calculation: 4,453,779kWh x 0.2556kg CO2e = 1,235tonnes CO2e

Stage 1 CRM 3: Energy Audits and Low Cost / No Cost Measures



It is recommended that Energy Audits are undertaken across the whole Warwick District Council Commercial Property portfolio. From experience energy audits generally save around circa 25% of energy, carbon and associated costs if the identified measures are implemented. Energy audits tend to identify a number of no cost/ low cost measures that should be implemented within the first year. Examples of these types of Energy Conservation Measures (ECMs) have been summarised as follows:

3.1 Building Energy Management System (BEMS) + Controls Review
3.2 LED Lighting Installation & Controls
3.3 Sub-Metering Installation
3.4 Energy Awareness Engagement & Management Procedures
3.5 Voltage Optimisation

Stage 1 CRM 3.1: Building Energy Management System (BEMS) Review

It is recommended that a detailed review and analysis of the commercial buildings BEMS in order to identify and align the buildings Heating, Ventilation and Air Conditioning (HVAC) system. This should be undertaken in order to detail the current status of control and setup and actual on-site control. Actions can then be prioritised, targeting the worst cases of poor control and wastage.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£28,000	204,003 kWh (Gas)	£40,801	37.5	0.7

Notes: As no site or energy systems inspections were possible within this Carbon Management Review, capital costs are sourced from similar projects implemented by the Consultants and as such should be regarded as an estimate. The capital cost is based on an assumption of 28 Council buildings having a BEMS @ £1000 per review.

Energy Savings are based on an assumed 3% reduction in gas consumption taken from examples of similar projects & savings calculated by the Consultants as part of their Energy Savings Opportunity Scheme (ESOS) compliance surveys. Assuming that energy will be kept to this level, this represents a one-off saving.

Carbon emissions use DEFRA 2019 conversion factors.

Stage 1 CRM 3.2: LED Lighting Installation & Controls

It is recommended that LED lighting and controls are installed throughout the WDC Operational property portfolio including all buildings and car parks (see separate CRM case for rural pathways and cycle ways). Benefits include 50% energy savings, reduced maintenance & improved lighting conditions.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£257,000	889,067 kWh (Elec)	£124,469	246.5	2.1

Notes: Lighting savings include buildings and carparks - WDC rural pathways case study information has been kept separate from the above. Capital costs are calculated to match the payback period expected.

Energy savings represent a 50% energy reduction from 30% of the organisational electricity consumption. NB Lighting accounts for 30% of the provided electricity data. Carpark lighting has been calculated directly from the car park energy consumption data provided.

Carbon emissions use DEFRA 2019 conversion factors.

Stage 1 CRM 3.3: Sub-metering Installation

It is recommended that comprehensive sub-metering hardware is installed as part of a strategic energy monitoring strategy. This will be supported by a proposal to provide a new real time energy monitoring software platform that can enable immediate management actions to reduce wastage, allow for performance reporting, and setting of reduction targets.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£140,000	222,689 kWh (Elec)	£31,176	61.8	4.5

Notes: The business case for automatic meter reading (AMR) goes beyond financial payback as an essential operational requirement to deliver performance reporting. A £140,000 investment sum has been allocated - which although included here as a Year 1 measure, could be integrated over a 3-year strategy. This would provide an estimated payback return over a 5-year period.

Stage 1 CRM 3.4: Energy Awareness and Engagement Procedures

It is recommended that WDC maintain and expand its Energy Awareness Campaign to include all levels of staff and service users. To enable this to be successful, a formal reduction target should be set i.e. 10% reduction within 3 years, with a widespread awareness campaign to be launched. This will include workshops and visible campaign material. The progress of the energy awareness campaign can be documented and visualised through the platform detailed in CRM 1.

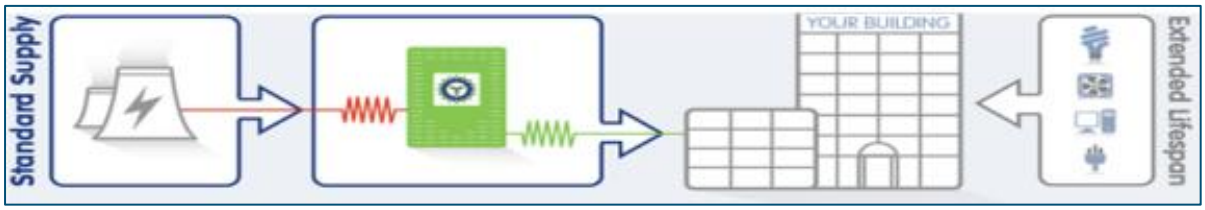
Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£10,000	337,616 kWh	£22,786	74.5	0.4

Notes: Energy awareness is an annual reduction based on 3% reduction on gas and electricity that would meet a 5 year corporate target of 10% energy reduction. Generally these type of projects result in 10% reductions but a conservative 3% reduction has been used in this case.

Carbon emissions use DEFRA 2019 conversion factors.

Stage 1 CRM 3.5: Voltage Optimisation

Voltage Optimisation is an energy saving technology that is used to regulate, clean and condition the incoming power supply in order to reduce the voltage supplied to the optimum level for the on-site electrical equipment and appliances. This measure can typically reduce the energy consumption by approximately 8% pa.



Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£63,000	222,689 kWh (Elec)	£31,176	61.8	2.0

Note: A cautionary 5% reduction has been applied to the associated electricity consumption following Voltage Optimisation system. This is against a documented 8% reduction from the manufacturer's estimated savings. Costs have been calculated on similar projects that deliver a similar payback

Stage 1 CRM 4: Lighting of Rural Footways / Cycleways

WDC propose to convert the 1056 lighting columns and sodium luminaires on rural pathways and footways owned by Warwick District Council to 25W LED luminaires on a rolling programme. A luminaire replacement scheme was submitted by WDC Asset Team to WDC Exec July 2019 – and awaiting approval decision. WDC also control and maintain other off-street lighting in the public realm including car parks and a full review is required.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£222,000	801,978 kWh (Elec)	£33,306	222.4	6.7

Benefits of LED luminaires include:

- Reduced maintenance costs
- 70% less energy used than conventional (metal halide) luminaires
- Improved visibility at night
- Reduced light pollution

Stage 1 CRM 5 LED Lighting Upgrade in Carparks

This CRM proposal is to convert current fluorescent luminaires within Warwick District Council owned carparks to LED luminaires and to include the installation of sensor controls.





Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£100,000	286,188 kWh (Elec)	£40,066	79.4	2.5

Note: Savings have been apportioned from other identified LED lighting measures with which the Consultants are familiar; costs calculated to meet an expected 2.5 year payback.

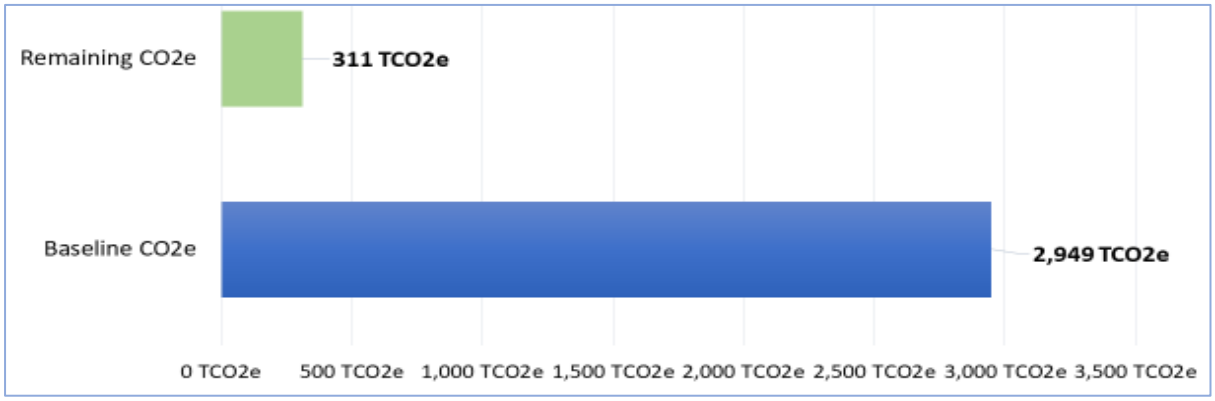
Stage 1 CRM – Summary of Investment and Reductions

Stage 1 – Immediate Actions / Measures (Year 1)

Key Measures Include: • Data Management System; • Sub-Metering; • REGO Green Energy Procurement.	• Building Energy Audits & Implementation of Identified No Cost/ Low Cost Measures

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£848,563	3,526,924 kWh	£361,757	2,637.4	2.3

The analysis gives a picture of the amounts of CO2e left to be removed at the end of Stage 1 i.e. Year 1 of the Council's Carbon Management Plan. This assumes that the CRMs listed are all activated in Year 1 of course.



Stage 2 – CRM Medium-Long Term Investments (Years 2 -3)

Stage 2 CRM 6: Heat Pump / Air Conditioning Rationalisation Retrofit

This technology uses intelligent compressor optimisation, which can reduce the energy consumption of compressors in air conditioning, refrigeration and heat pump systems by up to 40%. This can also be utilised on future heat pump installations.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£90,000	300,000 kWh(Elec)	£42,000	83.2	2.1

Notes: Calculations are based on a 30% electricity reduction on an assumed energy consumption associated on air conditioning.
Costs are based on similar projects designed to deliver a 2-year payback and documented by the manufacturer.

Stage 2 CRM 7: Building Thermal Improvements

It is recommended that Warwick District Council review and upgrade all levels of thermal insulation improvements (cavity, solid walls and roof spaces) within the commercial buildings to reduce the impact of energy wastage and provide building envelope thermal improvements where appropriate to provide an important backbone of zero carbon strategy.



We have included the below benefits based upon experience with other similar portfolios and buildings.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£300,000	225,000 kWh (Gas)	£4,500	41.4	66.7

Notes: These calculations are based on energy reductions associated with gas for heating achieved from similar projects. Costs have been provided to be applied to the full organisational portfolio.

Summary of Investment and Reductions (Stage 2)

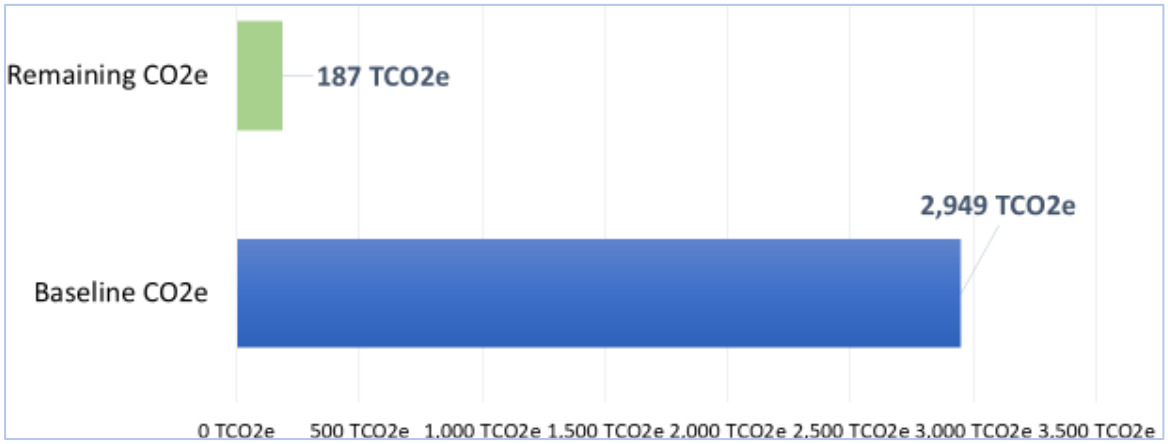
Stage 2 – Technological Actions/ Measures (Year 2 & Year 3)

Key Measures Include:
- Low Carbon Technology measures
- Building thermal improvement i.e. heat pumps, thermal insulation

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£390,000	525,000 kWh (Elec)	£46,500	124.6	8.4

Summary of Carbon Status after completion of Stage 1 & Stage 2

The graph below shows the summary of the impact of the implementation of WDC Organisation Stage 1 & Stage 2 carbon reduction measures against the overall WDC carbon footprint:



Stage 3 – Renewable Energy Technologies (Years 4 - 5)

Stage 3 CRM 8: Solar PV (Council Homes – Roof Mounted)

Warwick District Council has 170 solar PV systems installed on council-owned residential properties. These systems have generated an annual total of 309,802 kWh and have offset 85.9 tonnes CO_2e against the generation of this electricity. This is the equivalent of the emissions associated with 17 homes.



Notes: 309,802 kWh generated x Defra 2019 Conversion factor (including transmission & distribution factor) of 0.2773 = 85.9 tonnes CO2e

There is a potential for Warwick District Council to install many more rooftop installations on council homes across the District. This worked example is based upon the installation onto 20 council homes. Using an average of 3.5kWp per council house roof, this equates to 70kWp of solar power installed. Clearly given that the Council own circa 5,500 council homes, many of these could have PV installed – subject to location, roof structure review.

Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£100,000	37,800 kWh (Elec)	£3,780	10.5	26.5

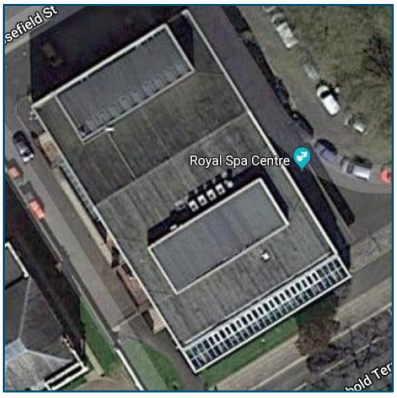
Notes: Installing a typical domestic 3.5kWp solar PV system would be an estimated £5k fully installed (c£1400/kWp). Worked example for 20 homes fitted Year 1 - 20 x 3.5kWp = 70kWp system generates 63,000kWh (@90% solar efficiency). 20-unit system replaces equivalent grid power. System assumes on-site daytime usage throughout the year of 60% x 63000kWh = 37,800kWh. Per annum saving of 37,800kWh @ £0.14p/kWh = £5,292.

New Smart Export Guarantee system (Jan 2020 Energy Savings Trust) provides example using fixed 5.5p SEG tariff (Octopus Energy). SEG yield would be 40% x 63000kWh generated = 25,200 kWh x 5.5p = £1386 pa. Total income benefit (savings + SEG) = £6,678. CO2e per 20 systems installed = 63,000kWh displaced x Defra 2019 conversion factor of 0.2773 = 17.46 tonnes pa

Small scale solar PV generation replaces power station electricity with renewable electricity. It is also important to help engage people and businesses in a low-carbon transition.

Stage 3 CRM 9: Solar Power on WDC Public Buildings

There are a number of high energy use public buildings owned by the Council that should be investigated for their potential for installation of rooftop solar PV systems. This will require detailed site and power supply review and it is acknowledged that some building roofs will be unsuitable for solar PV panels.



Examples of public buildings that could be considered are:

- Royal Spa Centre
- Leamington Town Hall
- Royal Pump Rooms
- WDC owned Leisure Centres
- Riverside House

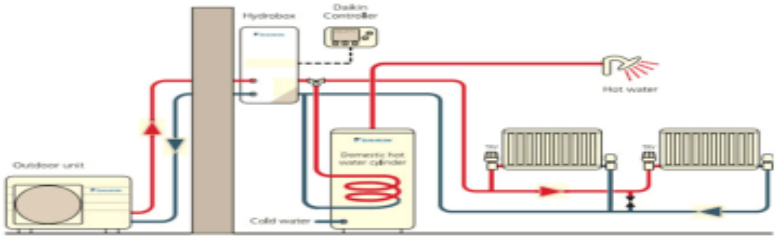
Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£30,000	28,000 kWh (Elec)	£3,920	16	0.1

Notes: The Royal Spa Centre example building is provided as a worked example. NB. This has not been subjected to a building structural survey nor power export assessment. No battery storage has been included and assumes 100% of daytime electricity used over 12 months. Current annual electricity usage at Royal Spa Centre = 224,633kWk per annum. 30kWp system would generate c 28,000 kWh grid electricity pa. Assuming 100% solar power is used in daytime hours, then 28,000 kWh saved in grid energy = £3,920 pa. CO2e saving using 2019 Defra conversion factor of 0.2773 / kWh = 16 tonnes CO2e pa

Stage 3 CRM 10: Air Source Heat Pumps (WDC Public Buildings)

The installation of Air Source Heat Pumps for heating and hot water within commercial buildings will eliminate the need for fossil fuels (usually natural gas). Individual buildings have not been assessed nor heating systems qualified. However, there is the potential to replace all fossil-fuelled heating systems with air source heat pumps (ASHP), which is rapidly becoming a key low carbon, low emission source of heating.





Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£1,400,000	-	-	47.6	-

Stage 3 CRM 11 Lighting Rural Footpaths – Off-Grid

Future lighting systems for off-street applications exist in several off-road and green space areas in Warwick District. One example is the plan for the Warwick Racecourse circular walkway. Installation of off-grid lighting columns will avoid the costs of grid cabling and connection works, whilst using solar and wind energy + battery storage to power zero carbon LED lighting.



Capital Cost est tbc (£)	Energy Saving (kWh)	Energy Cost Saving (£) excluding grid connection	Carbon Emission Saving (TCO_2e)	Payback (Years)
£200,000	32,850	£4,599	9.1	43.5

Notes: WDC is responsible for off-street lighting for pathways, cycle ways, parks and recreation areas. Use of off-grid systems operated by solar and wind generators with on-lamp battery storage can save high costs of grid connection in more remote areas such as green parks. Calculation above for the proposed Warwick Racecourse pathway is subject to approval and site inspection – and is provided as an example only. This worked example does not include the likely savings of not connecting to mains grid and cabling and cabling works. Should the project proceed, it will require contested/uncontested cost comparison of a mains grid connection from Western Power Distribution to identify off-grid infrastructure saving.

Summary of CRM Investment and Reductions (Stage 3)



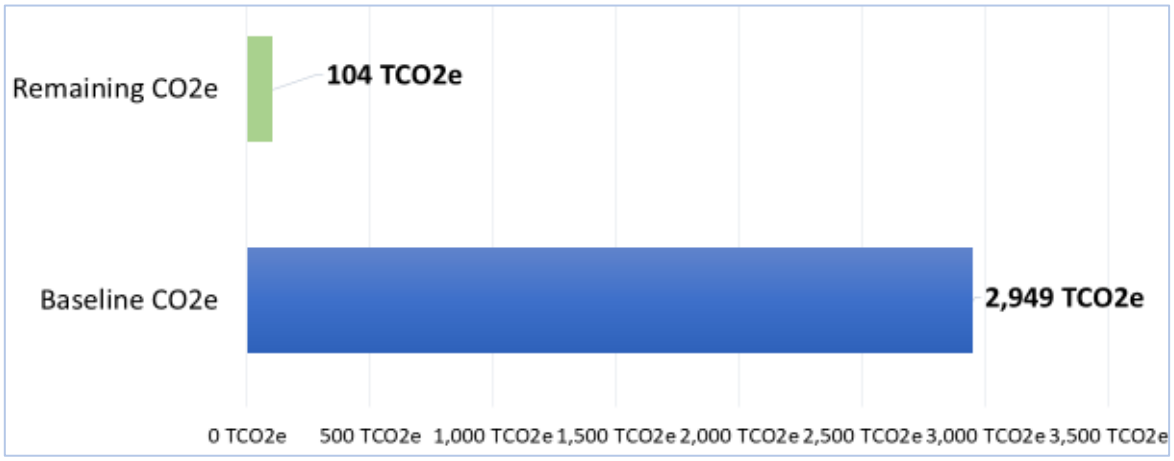
Stage 3 – Renewables (Year 4 & Year 5)

Key Measures Include:
- Solar PV
- Air Source Heat Pump
- Water Source Heat Pump



Capital Cost (£)	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£1,730,000	98,650 kWh	£12,299	83.2	140.7

Summary of Carbon Status after completion of Stages 1 – 3



Council Water Resources Stages 1-3:

Stage 1 CRM 1: Water Management Awareness Campaign



It would be recommended that a Water Management Awareness Campaign is expanded throughout Warwick District Council offices and public buildings. This can be included alongside a general Energy Awareness Campaign. It is recommended that campaign material is used to "save water" and "report leaks" etc.

Capital Cost (£)	Water Saving (m^3)	Water Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£3,000	2,052	£2,668	1.1	1.1

Note: cost and carbon savings include for supply and waste water. Calculations are based on an assumed conservative water usage saving of 3% supply and 3% waste reductions. This matches the savings assumed for the energy management awareness campaign and has been kept at a conservative savings against guidelines.

Stage 2 CRM 2: Water Management Technology



It is recommended that water saving technology is installed within all commercial buildings within the Warwick District Council portfolio. This could include water outlet rationalisation adaptors to taps and showers, water pressure regulating systems including waterless urinals.

Capital Cost (£)	Water Saving (m^3)	Water Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£42,000	6,841	£8,893	3.6	4.7

Note: cost and carbon savings included for supply and waste water. Calculations are based on a documented 10% reduction on supply and waste. Capital costs based on a documented payback of circa 5 years.

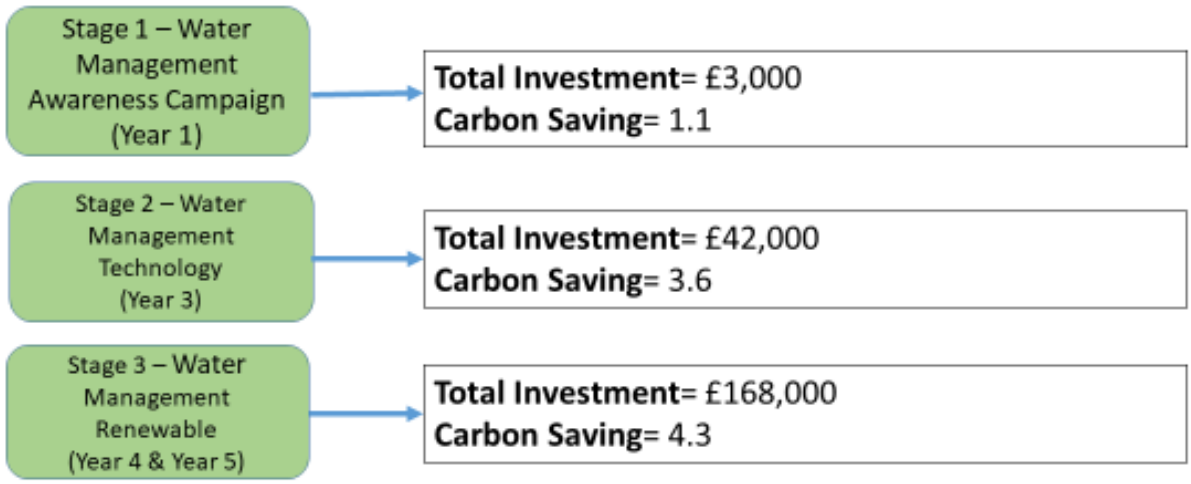
Stage 3 CRM 3: Water Management Renewables

There is potential for a rain water harvesting system including treatment to be installed across the commercial sites within the Warwick District Council non-residential buildings portfolio. This could collect water for use within toilets and for cleaning.

Capital Cost (£)	Water Saving (m^3)	Water Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£168,000	30,000	£39,000	15.8	4.3

Notes: this would leave drinking water only from the mains supply; cost and carbon savings included for supply and waste water. No buildings review has been carried out – this is an only and is calculated from 50% of the organisational water supply and waste water.

Summary of CRM Water Resources (Stages 1 - 3)



Total Cost of Investment	Water Saving (m^3)	Water Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£213,000	38,893 m^3	£50,651	20.5	4.2

Council Transport - CRM Stages 1-2:

Transport Emissions are a relatively small part of the Council's own carbon footprint. One Carbon World assessment (2019) evidenced this as around 2% (72 tonnes CO2e per annum). However, transition to electric vehicles, use of EV pool cars and staff behavioural change with regard to transport modal shift all raise awareness and demonstrate practical action.

Several actions proposed are already under way – for example WDC has replaced six of its car and van fleet with EVs by end of 2019. Vehicles are procured (purchase or lease) within individual Council Service Areas to meet service needs. There is a mix of purchase or lease procurement currently. With changing EV technologies, fleet leasing across the Council would ensure continuous upgrades as electric vehicle technology improves. Continuous advances in EV range and increase in EV charging network across the District will mean that all the Council fleet can be switched to electric over the next 3-4 years.



There appears to be no central fleet transport coordination in place – which could streamline usage of fleet vehicles and ensure cross-service area use. Closer analysis could demonstrate the benefits of introducing a shared EV pool fleet – in an attempt to reduce the 'grey business mileage' cost of £82,000 pa. Example shows the savings by introducing 2 shared pool EVs (e.g. Nissan Leaf) in Year 1.

Staff cycle-to-work or car share schemes fall outside of the Council's own carbon footprint and form part of the District's CO2e footprint along with all other employee travel emissions.

EV Charge points future technologies

All councils will be considering how to future proof their EV charging network. Indications are that standard fast and rapid charging using cables and holsters will remain as the main option for foreseeable future. However, alternatives should be considered where situations demand e.g. taxi ranks; on-street parking.

Future proofing EV charging infrastructure – cable charging will remain main method but on-street and taxi rank charging will require different solutions e.g.

- Lamp-post charging
- Fast charging hubs
- The connected kerb
- Street cabinets
- Induction pads



Courtesy: Connected Kerb

CRM Stage1 CRM 1: EV Charge Points

There are three electric vehicle (EV) charge points already installed in the Riverside House car park. There are also chargepoints at St Peters car park (for charging the Neighbourhood Services van) and Acorn Court (for the Lifeline services). These chargepoints are used exclusively by WDC's EV fleet. If the EV fleet is extended and/or to encourage Council staff to use their own EVs to commute to work, additional charge points could be installed. Note: The Workplace EV Charging grant (OLEV) is still available to subsidise the procurement and installation of EV charge points.

Benefits of adding to the Council's EV chargepoint infrastructure are:

- Encourages staff to switch to EVs
- Provides customers and clients with charging
- Powers WDC's extended EV fleet
- Supports contract transport transition to LEVs
- Improves local air quality



Example Actions	Additional Cost £	Energy saving £	CO2e saving
Add 4 EVCP sockets (2 x twin 7kW) at RSH car park	£4,700 (less £500/socket grant)	n/a	n/a
Install EV charge points at waste, street cleaning; grounds maintenance contract depots	TBC	TBC	TBC

Note: Further investment in EV charging points at Riverside House will depend upon the proposed HQ move as well as evidence of demand from staff for 'at work' charging. Other sites where WDC staff are working could also be considered for EVCP installations.

CRM Stage2 CRM 1: WDC Fleet Transition to Electric

WDC has currently a fleet of 5 cars and 8 vans. Of these 6 (46%) have been replaced over the last two years with electric vehicles (4 cars; 2 vans) and travelled 33,000 miles in 2018-19 representing 31% of WDC fleet travel. This example suggests replacing the six remaining six diesel vans and the Civic Car (with a total mileage of c74,000 miles in 2018) in Years 2-3. Actual timescales of such replacement will depend upon existing lease terms or age of purchased vehicles – and requires further analysis. Pace of replacement will also be steered by the current daily duty cycle of fleet vans (e.g. 16,000 miles pa) – and existing EV range and availability of district charging points. Estimates of cost / benefit below are based upon using a leasing model:

Example Action	Additional EV lease cost pa	Roadtax saving	Fuel saving Electric v Diesel	Total cost saving Year 1	CO2e saving tonnes pa
Replaced 6 diesel vehicles with electric (implemented 2017-19)	£1,944	£1,560	£3,732	£3,348	9
Replace remaining fleet with EV e.g. replace all 6 vans + civic car	£2, 810	£2,025	£8,281	£7,496	22

Notes: Lease costs are based on 3 years and based on 16k annual mileage; white eNV200. E-van £379.59 pcm; NV250 diesel £340.53 pcm (Nissan Sandicliffe 28.12.2019). Fuel cost savings – 74,000 miles @ 40mpg = 1,850gallons @ £6 per gall = £11,100pa; Electric costs @ 4m/kWh = 18500kWh @ 10p/kWh = £1,850 pa. Annual fuel saving £11,100 - £1850 = £9,250 pa. CO2e saving calculations – for new fleet replacement, 1850 gallons diesel (2018 data) = 8351 litres diesel displaced @ using Defra 2.62694kg/litre = 21.94 tonnes

CRM Stage1 CRM 2: WDC EV grey fleet business pool cars

This Carbon Reduction Measure proposes providing EV pool cars for staff essential business use. The Council's 'grey fleet' business miles totalled 184,000 in 2018 at a cost of £82,800. Including two EV pool cars would reduce grey fleet costs to the Council whilst reducing CO2e emissions. It would also improve air quality, encourage better driving habits, and provide an example of good practice locally.

Example Action	Addnl cost of EV lease pa	Grey fleet mileage saving pa	Grey fleet fuel saving pa @ £0.45/m	CO2e saving pa
2 EV pool car	£4,800	10,440 (6% reduction)	£4,332	2 tonnes

Notes: Lease cost pa @ £200pcm per EV = £2,400 pa; pool car use = 20 miles per day 261 days per year = 5220 miles (WDC data). Electric use 5,220 miles @ 4miles/kWh = 1,305kWh pa @ 0.14p/kWh = £183 elect cost. Essential users costs saved 5,220 miles @ £0.45 = £2,349. CO2e 5,220 miles @ 200g/mile = 1tonne. No pool car operation costs have been included within the calculation.

Summary of CRM Transport Emissions (Stages 1 - 2)

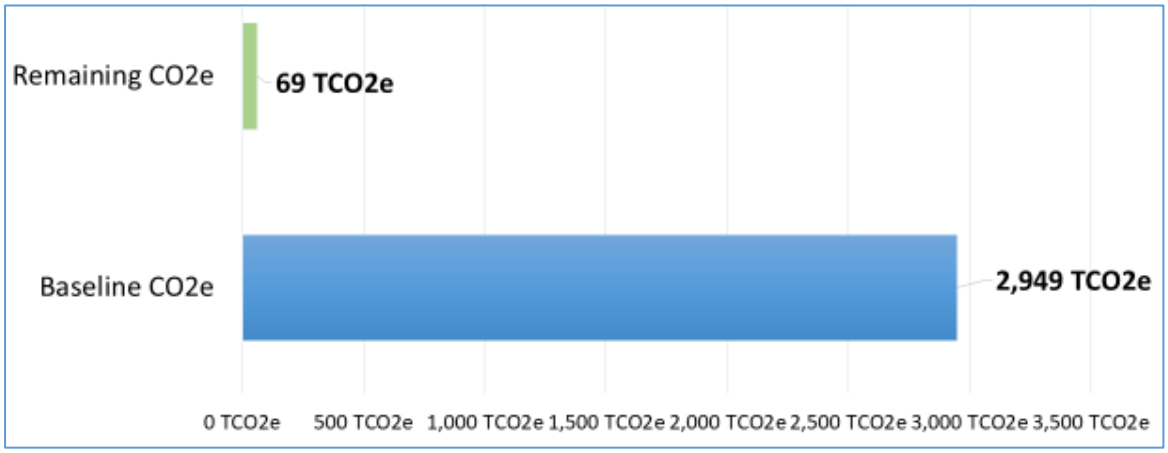
Stage 1 – Electric Vehicles (& installation of charge points) (Year 1 – 3 for fleet & Year 1 for charge points) → **Additional Cost** = £5,510; **Carbon Saving** = 22.0 tonnes CO2e

Stage 2 – Greyfleet Business Pool Cars (Year 1) → **Additional Cost** = £4,800; **Carbon Saving** = 2.0 tonnes CO2e

Additional Cost	Fuel Saving (Litres)	Fuel & Tax Saving (£)	Carbon Emission Saving (TCO_2e)
£10,310	n/a	£11,828	24.0

Summary of Carbon Status after completion of all CRM Stages

After completion of WDC buildings and energy (non-residential), water and transport Carbon Reduction Measures:



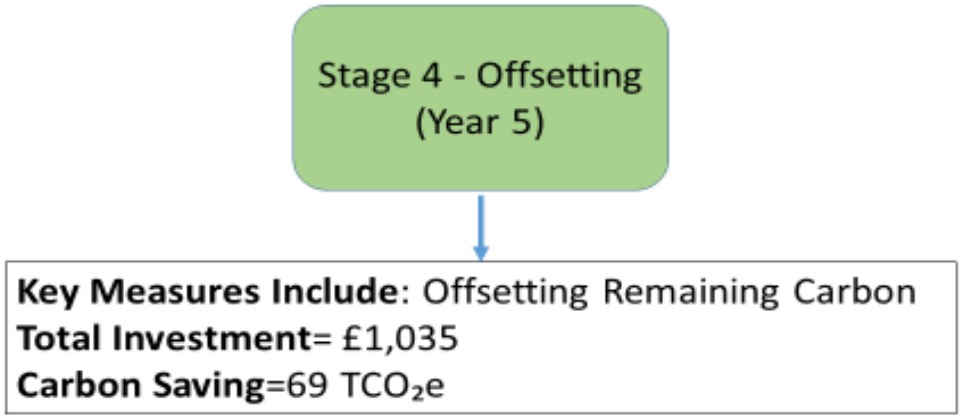
Stage 4 – Carbon Offsetting Measures



Following the Carbon Reduction Analysis above and if all the Carbon Reduction Measures are implemented, it is estimated that there would be a small surplus of CO2e remaining across the Council's estate (buildings, energy, transport and water) by 2025. To achieve the net zero target, the Council could carry out local off-setting e.g. tree planting on council-owned land.

Carbon Offsetting would be the recommended final phase of a planned carbon reduction strategy. It ideally should be deployed for the final elements of GHG emission reductions that can be not be readily practically achieved through intervention measures.

The carbon offsetting should be undertaken by a specialist organisation and carbon credits that is certified under the Verified Carbon Standard (VCS). Carbon offsetting costs of £15 per tonne have been included within the calculated measure.



International Offsetting

Warwick District Council has accepted an invitation to take part in the internationally recognised UN programme Climate Neutral Now which is administered by One Carbon World. The Council has been awarded a UN grant which in addition to supporting the calculation of the Councils baseline, includes the retirement of up to 300 tonnes equivalent of carbon credits. With the retirement of these credits Warwick District Council has achieved the criteria required for the Launchpad to Carbon Neutral Standard – and are informed that WDC will become the first council to take part in the internationally recognised 'UN Climate Neutral Now Scheme.

Note: The Consultants are unable to verify this certification and as such this 'carbon retirement' has not been accounted for within the calculations for the Council's carbon management plan.

Section 5 – Council-owned residential Housing

Domestic properties contribute significantly to the carbon emissions for Warwick District – and this is explained in detail in Work Package 3 Warwick District Climate Emergency Action Roadmap. As actual CO2e emissions from council homes (5,500 houses and flats) will be a direct result of energy used (gas, electric) by council tenants, and as it is not possible to access the household energy bills, such emissions are regarded as 'out of scope' of the Council's own carbon footprint.

However, as a considerate landlord, the Council has responsibility for and some control over ensuring that council homes are as energy efficient as possible – enabling tenants to reduce energy bills and contribute to a reduction of residential CO2e emissions across the District. Such a refit programme must go hand-in-hand with a vigorous awareness and energy education campaign. This will ensure that household behaviour compliments the building refit programme and provides tenants with the opportunity for making real savings in energy bills as well as enjoying the benefits of improved thermal properties i.e. warmer homes.

To provide an insight into the measures that could be delivered over the next 10 years and make a significant contribution to lowering the District's carbon emissions, the Consultants have provided an analysis of the likely costs and savings that might be anticipated. Estimates are provided and based upon EPC data provided by the Council's Asset Management Team NB 50% of all homes have now an up to date EPC certificate. Once the property condition survey of all residential properties has been completed, the delivery of a refit programme for existing council homes over 10 years can be implemented.

This analysis of council homes provides a useful baseline for the Council to assess the likely costs of property upgrades against the potential energy and carbon savings. This is also in line with the legal obligations on the Council – and all private landlords - from the Fuel Poverty Act which requires a minimum Energy Performance value of 'C' by 1st April 2030.

Notes: The need to upgrade council homes has been acknowledged already by WDC – and illustrated by the approved motion in February 2019 to ring fence £90,000 to develop a plan for low energy housing (retro-fitting and new homes) with the objectives of reducing tenant's energy bills, addressing fuel poverty and cutting emissions.

Baseline data has been utilised from OCW information which in itself is sourced from the Department of Business, Energy and Industrial Strategy **(**BEIS) standard local authority reporting with energy usage and buildings efficiency data provided directly by WDC Asset Team to enable the calculation of the refreshed carbon footprint. DEFRA 2019 carbon conversion factors have been utilised for consistency.

Electricity and gas emissions data for council-owned residential properties have been calculated from average EPC rating for each residential property type. An average kWh/per m2/ per year figure was sourced from online to assist with the calculations ref: https://www.energyrating.org.uk/energy_performance_certificate1.html . Using example EPC certificates it has been assumed for the purposes of this carbon refresh exercise that the split between electricity and gas within a residential home is 66% energy associated with heating and 33% energy associated with electricity usage.

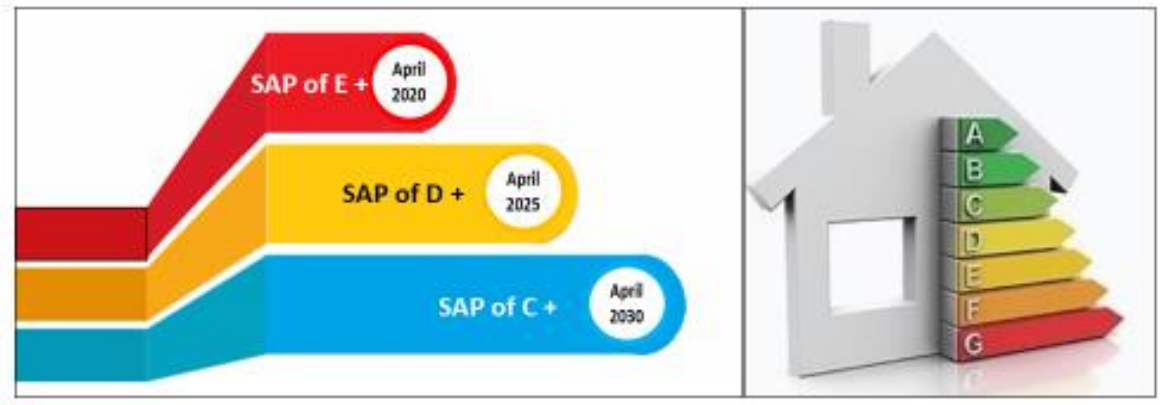
WDC Council Homes Carbon Management Analysis

This section focuses upon the council homes upgrade programme needed to align with the Fuel Poverty Act (FPA) requirements by 2030, which are:.

1st April 2020 – Regulations will now apply to all existing residential rented property which is required to meet the Minimum Energy Efficiency Standards of an EPC SAP rating of Level E or above (this will includes existing tenanted dwellings without an EPC).

1st April 2025 - Regulations will now apply to all existing residential rented property which is required to meet the Minimum Energy Efficiency Standards of an EPC SAP rating of Level D or above.

1st April 2030 – Regulations will now apply to all existing residential rented property which is required to meet the Minimum Energy Efficiency Standards of an EPC SAP rating of Level C or above.



Note: This analysis provides the cost estimate based on simply meeting the minimum EPC standards required under the FPA. The Council may choose to exceed these requirements e.g. by upgrading to Level 'B' or in some cases Level 'A' e.g. installing solar photovoltaic and heat pumps. It might also decide to complete the upgrade of properties to FPA minimum standards ahead of 2030 deadline.

Council Homes Improvement Programme Cost Estimate

Stage 1 – EPC Improvement Programme (Year 1 - 5) → **Key Measures Include**:
Total Investment= £17,788,360
Carbon Saving= 3,362.2

Stage 1.2 – EPC Asset Register (Ongoing) → **Key Measures Include**:
Total Investment= £11,000

Total Cost of Investment	Energy Saving (kWh)	Energy Cost Saving (£)	Carbon Emission Saving (TCO_2e)	Payback (Years)
£17,799,360	-	-	3662.2	-

EPC Programme Financial Impact

The Consultants have produced a cost estimate plan for the improvement of all council-owned residential properties by 2030:

EPC Improvement Programme	Cost of Action per Annum (£)	Gas TCO2e	ELEC TCO2e	Total CO2e
WDC to improve the existing portfolio of dwellings with a SAP rating of F + G to meet the Fuel Poverty Act of E+ by 2020	£ 136,772	221.1	152.5	373.6
WDC to improve the existing portfolio of dwellings with a SAP rating of E+ to meet the Fuel Poverty Act of D + by 2025	£ 3,569,340	663.2	457.5	1,120.7
WDC to improve the existing portfolio of dwellings with a SAP rating of D+ to meet the Fuel Poverty Act of C+ by 2030	£ 4,908,600	884.3	610.1	1,494.3
WDC to update the existing portfolio of dwellings with no EPC rating to meet the Fuel Poverty Act of C+ by 2030	£ 9,173,648	221.1	152.5	373.6
It is further recommended that as part of a developing EPC roll out programme that an asset register is compiled and completed by the EPC assessment team.	£ 11,000			
Totals	**£ 17,799,360**	**1,989.5**	**1,372.6**	**3,362.2**

Note: The above cost analysis provides broad estimated costs based on getting the current EPC portfolio to meet the key stages of the Fuel Poverty Act (including measures such as insulation improvements, window upgrades, boiler replacements, LED lighting installs).

To confirm the level of upgrades required in energy systems and building fabric and other refit technologies, it is recommended that as part of a developing EPC roll out programme an asset register is compiled and completed by the Council's housing and asset management teams.

Note on Domestic data methodology: Using data drawn from the WDC database and specifically the EPC council homes database, CO2e modelling was based on the average kWh/m2 from all the available SAP EPC data. This modelled energy use indicator factor was applied to all the portfolio categories by obtaining the floor area data for the whole council-owned domestic portfolio (and accounting for dwelling types) and calculating the total energy use. This provided the energy use to the categories (i.e. dwelling type) and the whole portfolio.

The study also sampled/cross checked the energy use with information available for portfolio information on Social Housing and also Ofgem published information.

Section 6 – A Note on Data

The development of a Climate Change Plan requires the collation of key data and information from wide and varied sources. This information relates to the CO2e emissions produced by WDC operation that is calculated from numerous data sources that cover:

- Building energy use
- Water use
- Waste
- Business transport & travel
- Renewable energy generation
- Assets
- Processes, chemicals & gases

Note: Even with the current availability of information within the Council, in order to make appropriate carbon reduction decisions and implement the Carbon Management Plan, it is essential that a robust and accessible GHG data and reporting infrastructure is reinforced and resourced.

The regular measurement and collation of this information requires essential baseline data to determine carbon impacts, establish performance, identify areas of improvement and enable strategic investment planning and identify benefits.

As reporting GHG emissions is no longer a mandatory requirement for councils, the re-establishment of data reporting, measuring and monitoring of results should be an essential part of ensuring future progress to meet the Council's 2025 net zero target for CO2e.

Warwick District Council Carbon Management Costplan – Summary

Area	Action	Year	Cost of CRM Investment	Energy Saving (kWh)	Fuel	Cost Saving - fuel etc	CO2e Saving (Tonnes)	Payback (Years)
Stage 1 – Immediate Actions / Measures	**Data management system; sub-metering; REGO green energy procurement; building energy audits; Implementation of identified no cost / low cost measures**							
Stage 1 CRM 1	Implement Data System/ Calculate Baseline	Year 1	£25,000	562,694		£37,977	618	0.7
Stage 1 CRM 2	Green Energy Procurement	Year 1	£3,563	0		£0	1235	N/A
Stage 1 CRM 3	3.1 - Building Energy Management System (BEMS) and Controls Review	Year 1	£28,000	204,003	Gas	£40,801	38	0.7
Stage 1 CRM 3	3.2 LED Lighting Installation & Controls	Year 1	£257,000	889,067	Elec	£124,469	247	2.1
Stage 1 CRM 3	3.3 Sub-Metering Installation	Year 1	£140,000	222,689	Elec	£31,176	62	4.5
Stage 1 CRM 3	3.4 Energy Awareness Engagement & Management Procedures	Year 1	£10,000	337,616		£22,786	75	0.4
Stage 1 CRM 3	3.5 Voltage Optimisation	Year 1	£63,000	222,689	Elec	£31,176	62	2.0
Stage 1 CRM 4	Lighting Rural Footways / Cycleways	Year 1	£222,000	801,978	Elec	£33,306	222	6.7
Stage 1 CRM 5	LED Upgrade - Carpark	Year 1	£100,000	286,188	Elec	£40,066	79	2.5
Stage 1 Immediate Actions / Measures	**TOTALS**	**Year 1**	**£848,563**	**3,526,924**		**£361,757**	**2637**	

Area	Action	Year	Cost of CRM Investment	Energy Saving (kWh)	Fuel	Cost Saving - fuel etc	CO2e Saving (Tonnes)	Payback (Years)
Stage 2 – Technological Actions/ Measures	**Low Carbon Technology measures**							
Stage 2 CRM 6	5.1 Heat Pump / Air Conditioning Rationalisation Retrofit Technologies	Years 2-3	£90,000	300,000	Elec	£42,000	83	2.1
Stage 2 CRM 7	Building Thermal Improvements	Years 2-3	£300,000	225,000	Gas	£4,500	41	66.7
Stage 2 TOTALS	**Low Carbon Technology measures**	**Years 2-3**	**£390,000**	**525,000**		**£46,500**	**125**	
Stage 3 – Renewables	**Solar PV; Heat Pumps**	**Years 4-5**						
Stage 3 CRM 9	Domestic Solar PV – Roof Mounted	Years 4-5	£100,000	37,800	Elec	£3,780	11	26.5
Stage 3 CRM 10	Solar Power ~ WDC Public Buildings	Years 4-5	£30,000	28,000	Elec	£3,920	16	19
Stage 3 CRM 11	Air Source Heat Pumps ~ WDC Public buildings	Years 4-5	£1,400,000	0		0	48	0
Stage 3 CRM 12	Lighting Rural Footpaths – Off-Grid	Years 4-5	£200,000	32,850	Elec	£4,599	9	43.5
Stage 3 – Renewables	**TOTALS**	**Years 4-5**	**£1,730,000**	**98,650**		**£12,299**	**83**	
Summary of Investment and Savings (Stages 1 – 3)			**£2,968,563**	**4,150,574**		**£420,556**	**2,845**	

Area	Action	Year	Cost of CRM Investment	Energy Saving (kWh)	Fuel	Cost Saving - fuel etc	CO2e Saving (Tonnes)	Payback (Years)
Water Awareness, Technology and Harvesting								
Stage 1 CRM 1	Water Management Awareness Campaign	Year 1	£3,000	2,052		£2,668	1.1	1.1
Stage 2 CRM 2	Water Management Technology	Year 3	£42,000	6,841		£8,893	4	4.7
Stage 3 CRM 3	Water Management Harvest / Recycle	Years 4-5	£168,000	30,000		£39,000	16	4.3
Water	**TOTALS**		**£213,000**	**40,945**		**£50,561**	**22**	

WDC TRANSPORT	Action		Additional cost of CRM			Fuel & tax saving £	CO2e Saving (Tonnes)	Payback (Years)
WDC diesel fleet	Replace remaining fleet with EV - 6 vans + civic car	Years 2-3	£2,810			£7,496	22	0.4
WDC RSH charge points	Add 4 EVCP sockets (2 x twin 7kW) at RSH car park	Year 1	£2,700				0	
EV Greyfleet business pool cars	2 EV pool car leased	Year 1	£4,800			£4,332	2	1
WDC TRANSPORT	**TOTALS**		**£10,310**			**£11,828**	**24**	

Stage 4 - Offsetting	Offsetting Remaining Carbon - @£15/tonne	**Year 5**	**£1,035**				**69**	

	Actions include/exclude	Year	Cost of CRM Investment	Energy Saving (kWh)	Fuel	Cost Saving - fuel etc	CO2e Saving (Tonnes)	
GRAND TOTALS	**Excludes council homes, heat network and solar park**	**Years 1-5**	**£3,192,908**	**4,191,519**		**482,945**	**2,960**	

SUMMARY:		Year 1	Years 2-3	Years 4-5	Totals
Costs of carbon reduction measures (CRM)		£859,063	£434,810	£1,899,035	£3,192,908
£ Savings		£368,757	£62,889	£51,299	£482,945
CO2e Savings		2639	147	168	2,954

WP2 - Warwick District Council Carbon Management Plan (Estate)

Carbon Reduction Measures (CRM) - Summary FINAL

Cost estimate of implementing the Council's carbon management plan (WP2)

Year	Year 1	Years 2-3	Years 4-5
Investments - public buildings, lighting	£848,563	£390,000	£1,730,000
Water	£3,000	£42,000	£168,000
Transport	£7,500	£2,810	£0
Offsetting			£1,035
TOTALS	**£859,063**	**£434,810**	**£1,899,035**
5-Year Cost estimate £		**£3,192,908**	

Estimated energy and fuel cost savings of the Council's carbon management plan (WP2)

Year	Year 1	Years 2-3	Years 4-5
Investments - public buildings, lighting	£361,757	£46,500	£12,299
Water	£2,668	£8,893	£39,000
Transport	£4,332	£7,496	
Total	**£368,757**	**£62,889**	**£51,299**
5-Year Savings estimate £		**£482,945**	

Estimated carbon savings (tonnes) from the Council's carbon management plan (WP2)

Year	Year 1	Years 2-3	Years 4-5
Investments - public buildings, lighting	2637	125	83
Water	1	4	16
Transport	2	22	
Off-setting			69
Total	**2641**	**150**	**168**
5-Year Savings CO2e tonnes		**2959**	

A Climate Emergency Action Roadmap for Warwick District (Work Package 3)



Warwick District Climate Action Roadmap - Executive Summary

This section highlights the key actions and recommendations from Work Package 3, the Warwick District Climate Action Roadmap. This interim document provides a direction of travel for the eventual Climate Emergency Action Plan to be prepared by the programme team once in place. The annex was produced in support of the January 2020 reporting schedule required following the declaration of a Climate Emergency by the council in June 2019 and a commitment to facilitating the District's decarbonisation to as close to zero as possible by 2030.

The Council has chosen to use Anthesis' Greenhouse Gas Reporting Tool SCATTER for the 10-year programme of work. The modelling features of this tool which can be used to test the impact of emissions reduction measures will not be available until later in Quarter 1, 2020. Data analysis for this report has been carried out by hand and will require confirmation once SCATTER Phase 2 is available.

This roadmap considers Mitigation (reducing greenhouse gas emissions), Adaptation (managing the consequences of a changing climate) and Offsetting (compensating for emissions by reducing emissions elsewhere).

It is expected that 2020 will be used for capacity building and initiating high priority actions outlined below:

1. The first action is to establish the Warwick District Climate Action Programme team. Once in place the team will need to:
    a. Develop the Climate Emergency Action Plan and costings for the 10-year programme. The roadmap for the District presented in WP3 is intended as an initial input into the planning work to be undertaken by the Climate Emergency Action Programme team once appointed.
    b. Establish budgets and secure funding for the programme
    c. Adopt SCATTER Phase 2 once it is released and identify other data source to confirm the priority analysis, emissions budgets and reduction targets presented in WP3
    d. Establish a responsive local monitoring, forecasting and reporting method for GHG emissions. This needs to cover energy use and account for changes in land use from activities like tree planting. The impact of the local plan needs to be accounted for both in terms of transport and housing

2. The key sector priorities for action in order are Transport, Housing and then the non-domestic sector.

3. Early priorities for Transport are the adoption of electric vehicles, reducing emissions from commuting and reducing car use for short journeys. Initiatives within this sector include:
    a. converting taxi fleet to EVs
    b. expanding cycleways in parks
    c. increasing EV charging points significantly

4. Work with WCC on a Sustainable Transport Strategy for the area. This needs to cover aspects of transport emissions that occur in the District but are caused by activity from outside for example, motorway travel, HGV use and train travel. Funds need to be set aside for supporting these initiatives. Areas to be covered include:
    a. reduce vehicles movements
    b. adoption of EVs
    c. parking strategy
    d. inter town safe cycle routes
    e. a review of the Local Plan in relation to transport

5. Early priorities for reducing household emissions are targeting gas usage for heating through building efficiency improvements, switching to green energy and adoption of 100% renewable energy contracts. Initiatives in this area include:
    a. Provide help to householders to upgrade their energy efficiency and encourage renewables for which a grant scheme could be offered
    b. Find appropriate large-scale models of engagement to achieve the impacts on household emissions reductions needed.

6. The priority for the non-domestic sector is to identify and engage with existing energy / emissions planning.

7. Adaptation planning needs to consider the priority risks identified by the Committee on Climate Change's Risk Assessment. These include flooding and the impacts of rising temperatures on residents and the natural environment.

8. Partnerships and collaboration with other public sector organisations (WCC, BCC, CCC, and WMT) and organisations in the private sector (large employers, institutional organisations, and housing associations) will be an important part of the programme's strategy.

CEAP Warwick District - Introduction and Context



The purpose of this Climate Action Roadmap for Warwick District is to provide an interim high-level summary for use in preparing the Climate Emergency Action Plan (CEAP). It has been prepared now to meet the reporting requirements for the end of January 2020 which in turn supports the 2020 budgeting cycle. This roadmap will provide an indication of direction of travel for the Climate Action Programme when it is established. A short time has been available to undertake this investigation and roadmap development and necessary compromises have had to be made to meet the January objective. It is expected that the full plan and costing will be developed by the programme team.

In order to meet the required reporting timescales, we have presented this document as a series of PowerPoint slides with narrative. Extensive data and resource analysis has been carried out to support this summary approach. The appendices will contain a log of the resources used and where appropriate data sources are referenced.

Key to the successful delivery of the 10-year programme to bring Warwick District's Greenhouse Gas Emissions (GHG) emissions to as close to net zero as possible is the appointment of internal team to run the programme. At the time of writing these resources are likely to be in place in Quarter 1, 2020 and it is expected that this roadmap will support that team's more detailed planning going forward. That will ensure 'ownership' of the delivery of the District's Climate Emergency Action Plan.

Additionally, we understand that the Anthesis, greenhouse gas reporting tool, SCATTER is to be used for planning and modelling the impact of measures. The modelling functionality in SCATTER called SCATTER Phase 2 Pathways will not be available until later in Quarter 1 and must go through a user acceptance test before release. Illustrative modelling of carbon budgets, priorities and measures for this report has by necessity been done by hand to meet the report deadline. SCATTER Phase 1 2017 data has been used along with data from other sources, identified in the text.

The Consultants have only considered emissions from energy use in this analysis as the consumption of fossil fuels caused the bulk of the GHG emissions but note that land use will need to be taken into account when creating a footprint for the District that takes into account tree planting. It is noted that there is the potential to widen the scope of reporting to cover emissions caused outside of the District, attributed to food and consumption of goods. This is left out of the analysis but raised as an issue for later consideration.

The Roadmap shows how data can be used to identify priorities for action and develop scenarios for emission reduction strategies.

Important Note: It is important that all analysis in this Annex is re-run once SCATTER Phase 2 (Pathways) is available (March 2020) and SCATTER outputs and scenarios will be used for planning in the future.

Carbon Budget and Emissions Reduction Targets

Emissions Budget and Reduction Target

Carbon Budget Period	Recommended Carbon Budget (Mt CO_2)
2018 - 2022	3.9
2023 - 2027	1.9
2028 - 2032	0.9
2033 - 2037	0.4
2038 - 2042	0.2
2043 - 2047	0.1
2048 - 2100	0.1

Source: Tyndall (2019)

KEY POINTS:

- Warwick District's suggested emissions **budget** is **7.5mt CO2e**
- At current rates of emissions this will be **exhausted in 7 ½ years**
- **Local actions required** to reduce emissions from Business as Usual
- **Largest reduction** needed in **2023-2027**
- **Preparation** needed in **2020-2022**

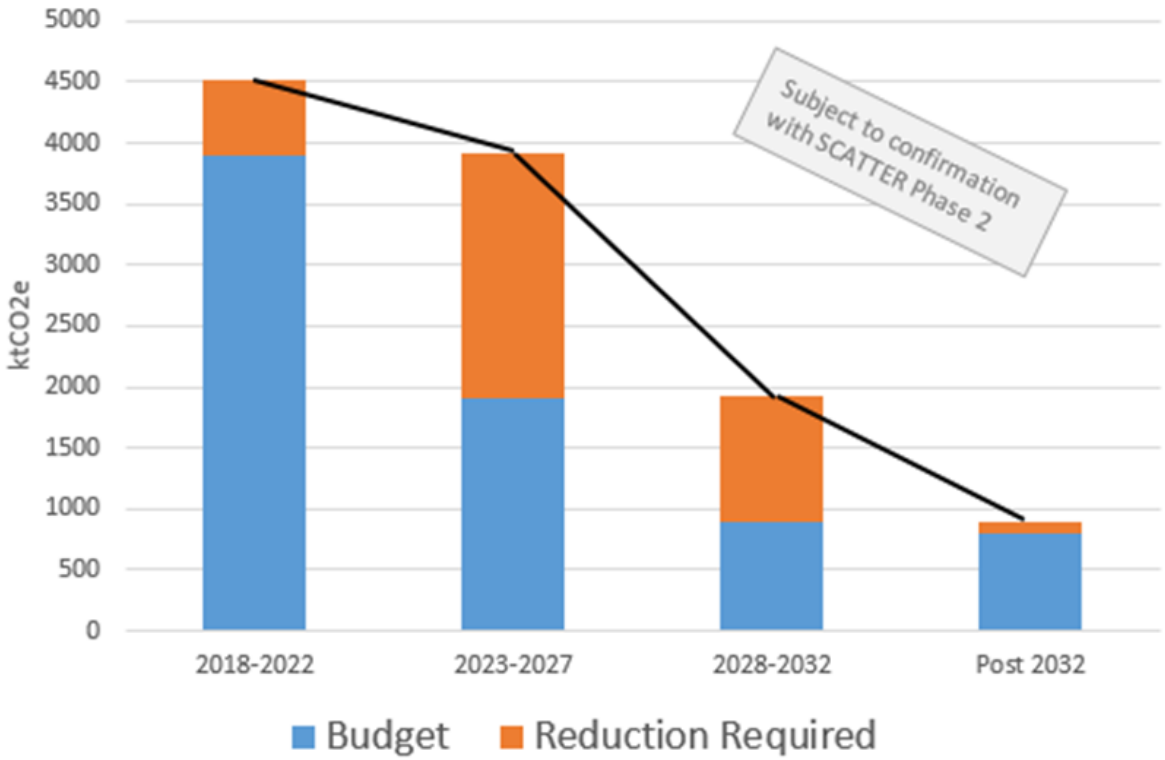
Just as a financial project to reduce costs would start with a budget, a GHG emissions reduction programme can work in the same way with an emissions reduction budget. In both cases, subtracting that budget from current costs provides a measure of reductions needed. The Tyndall Centre has created GHG emissions budgets for local authorities.

The budget is described in "Setting Climate Commitments for Warwick", Tyndall (2019) and explains:

"This report presents climate change targets for Warwick that are derived from the commitments enshrined in the Paris Agreement, informed by the latest science on climate change and defined in terms of science-based carbon setting. The report provides Warwick with budgets for carbon dioxide (CO_2) emissions and from the energy system for 2020 to 2100. The carbon budgets in this report are based on translating the "well below 2°C and pursuing 1.5°C" global temperature target and equity principles in the United Nations Paris Agreement to a national UK carbon budget"

It is understood that this Tyndall Carbon Budget for Warwick (referred to as the District's Carbon Budget from now on) will be incorporated into the SCATTER Phase 2 release which will be used for emissions reduction planning. We have used this budget in our interim calculations prior to the release of SCATTER Phase 2 and this has been helpful in providing an initial estimate of the required emissions reductions for the roadmap. This in turn helps to size the measures and effort required to achieve the net zero target.

The budget uses the same five-year periods as the Climate Change Act with the third period finishing in 2032, slightly later than the 2030 net zero goal. The figure below shows the pattern of the District's Carbon Budgets and estimated emissions reductions that we calculated. Assumptions have been made about the level of business as usual emissions if no local action is taken. These need to be confirmed in SCATTER Phase 2.



Suggested reductions in 'Business as Usual' emissions required to achieve the Carbon Budget for Warwick District

The Carbon Budget allocates a further 7.5 mtCO2e of emissions to the District from 2018 onwards, split into five-year budgeting periods. SCATTER's 2017 data (Anthesis, 2019a), shows the District's total emissions were just over 1 mtCO2e per year. The Tyndall report (Tyndall, 2019) notes that the Carbon Budget would be exhausted in 7 and a half years at this rate of emissions. The historical emissions trend is falling for some sectors (BEIS, 2019b), due to international and national initiatives. This would extend this deadline by a few years but the deep cuts in emissions are required to meet the 2030 net zero ambition. This will require active engagement at the local level.

To estimate the size of the emissions reductions required we derived an estimate of future emissions from the District if no action is taken, termed the Business as Usual (BAU) case. We used an estimate in the Tyndall report and our own straight-line projections to assign a further 1.8 mtCO2e of emissions for 2018 -2019. For 2020 onwards we assumed a small rise in transport emissions following the historical trend and emissions continuing at the same rate as 2019 going forward. Subtracting the Carbon Budget from the BAU case for each budgeting period then gave an indication of the emissions reduction target in each period, shown in the figure above.

The District's population is forecast to rise over the programme period. This has not been taken into account in this model. There are some emissions over which there is little local control which will need to be assigned to the District's carbon budget, for example aviation and motorway travel.

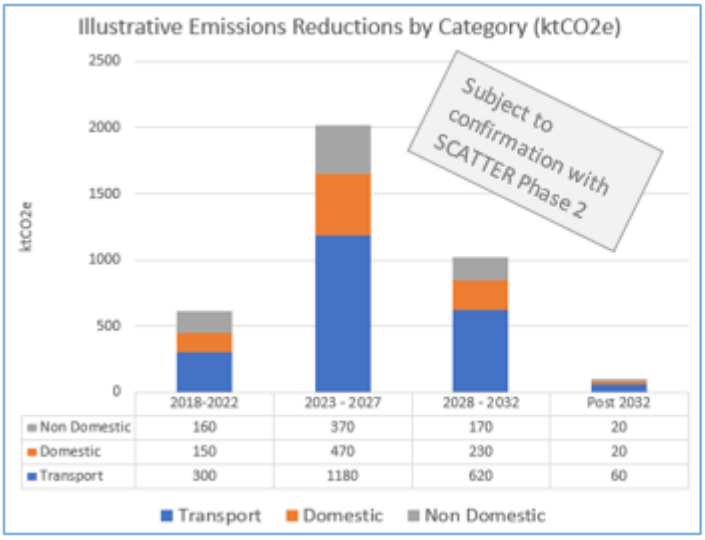
Note: It is important to emphasise that this calculation needs to be reviewed by the team once the Climate Action Programme is operational and SCATTER Phase 2 is available. In line with the objective of this Roadmap is does however give an indication of the direction of travel and size of the task ahead.

Note: The role of the Local Plan is important both in terms of forecasting growth in population, dwellings and transport needs. The Business as Usual case for this analysis does not account for a population growth and therefore may show an underestimation of the emissions reductions target required to meet the Carbon Budget. It is expected that measures in the Local Plan and use of planning instruments will help to alleviate upward pressure on emissions from any increase in population. Once SCATTER Phase 2 is available this scenario will be easier to model. Main observations are:

- A conclusion that stands out is that the largest reduction will be required in the 2023-2027 budget period, with preparation necessary in the previous period.
- A budget for residual emissions post 2032 has been consolidated in this chart and any further reductions are likely to require offsetting.

Data sources: Tyndall (2019) and ONS (2019a) - UK local authority and regional carbon dioxide emissions national statistics: 2005-2017

Emissions Reduction Target – By Category



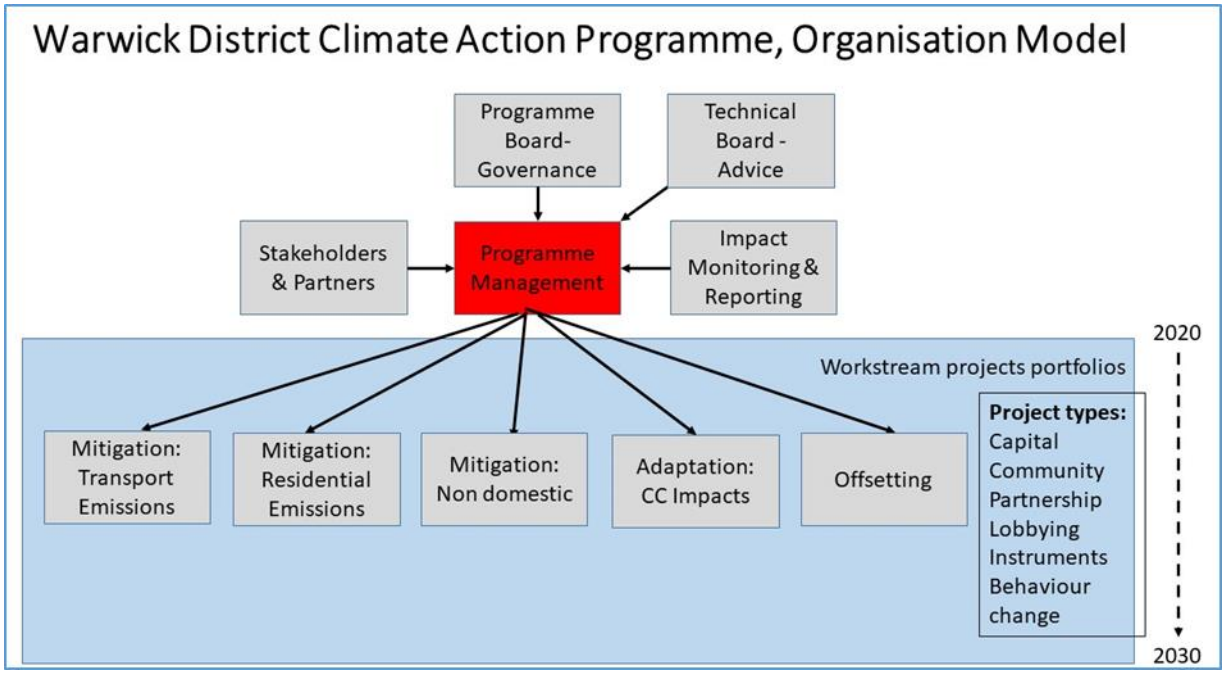
KEY POINTS:

- **Largest reduction** required in **Transport** in **2023-2027**
- Uses estimate of the category split in 2020

This chart illustrates how the total reductions in each period needed to meet the budget may could split category (transport, domestic and non-domestic) using the relative sizes of the emissions from those categories estimate for 2020.

The largest category is transport followed by domestic and then the non-domestic category. The size of these targets along with knowledge of current trends can be used to assign priorities to activity. As noted above although the largest emissions reduction target is in 2023 -2027, significant activity will be need over the next 3 years to prepare for this.

Suggested CEAP Programme Organisation



The Organisational Chart above shows a suggested organisation for the programme:

- **Programme Manager** - One of the recommendations from ARUP in their Climate Emergency Planning report 2019 is Ownership. We are aware that WDC plan to appoint a new Strategic Director and that the new Climate Action Programme team will wish to review this as part of their programme initiation activity.
- **Programme Board** – A programme of this size will require governance to reflect the wide ownership of the issue across the District
- **Technical Board** – The programme team may wish to engage external advice for particular issues and to provide oversight of the more technical aspects of the project.
- **Impact Monitoring and Report** – This is covered further on but highlights the need to have robust methods for measuring the impact of mitigation measures
- **Stakeholders and Partners** – Many of the solutions to reducing emissions are wider than district and it will be necessary to work with partners. Stakeholders within the district also have an important role to play in activity. One of the actions of the programme initiation may be develop a Communications Plan.

The Stakeholder Communications Plan will need to consider how to engage with a variety of interests in the district. Of importance will be how the Climate Action Programme should be presented and named. Activity within the programme could be structured into several workstreams matching the reporting categories. We would see a series of portfolios of prioritised projects being developed and actioned as the programme progresses.

The suggested choice of the three main categories of Transport, Domestic and Non-Domestic as workstreams was determined by data availability and structure. Although, SCATTER breaks down the Non-Domestic category into several sub-categories. In designing a programme of work, projects are selected to solve the problems and priorities that the data is highlighting. When the programme team take ownership of the plan, they will wish to review how the programme is structured.

There is high degree of uncertainty about how the national and international climate emergency may develop and the programme will need to adopt project management methods that can accommodate this uncertainty, for example risk and issue management along with an 'agile' approach to running projects. This structures project plans in iterations and incremental steps allowing the team to deliver results earlier and test their effectiveness.

Workstreams

These workstreams are suggested and shown in the programme structure diagram above.

- Monitoring – monitoring will need to be done through the programme and can be treated as a workstream
- Mitigation transport – covers transport emissions
- Mitigation domestic – covers emissions from domestic properties irrespective of tenure
- Mitigation non-domestic – covers industrial, commercial and institutional building along with farms
- Adaptation – this workstream deals with planning for the consequences of a changing climate and recovery actions if events occur
- Offsetting – this is a strategy available for countering emissions that cannot be mitigated. It is a lower priority at the start of the project but will need to be considered later to manage residual emissions post 2032. The Offsetting workstream also covers local energy generation projects.
- Natural environment – not shown on the chart but activity will cover development of the natural environment to support biodiversity and recreational use amongst other benefits. The workstream would be the best place to cover tree planting projects given the wide range of benefits (not just a carbon sink) that will arise.

Projects

Each workstream will consist of a rolling portfolio of projects which could take one of several forms depending on the nature of the stakeholders, action required and ownership of the assets causing the emissions. It is likely that the Climate Action Programme team will manage the projects (or coordinate them) so that an overall view of activity across the District can be maintained. This will require a skill set which will be developed in the Programme Initiation Stage (PID) and may need external support in some cases.

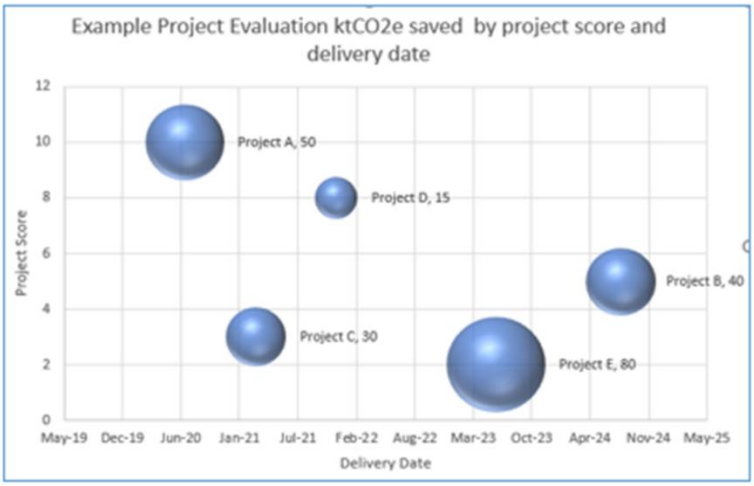
There will be different types of project:

- Capital - infrastructure projects like the heat network project
- Community – action taken by community organisations supported by the community fund, for example a community energy project
- Partnership – some action will need to be taken in collaboration with other public sector bodies for example in transport planning. There will also be work with the private sector.
- Lobbying – Some of the required emissions reductions will come from national action and there is a role here for lobbying in those causes. The types of lobbying required will become clearer as the future landscape becomes clearer.
- Instruments - This is the application of law and regulations, for example in the use of planning regulations
- Behaviour change – some emissions reductions will come from changes in behaviour, requires particular skill sets, for example encouraging a move away from the use of cars for short journeys and action to reduce energy use in homes.

Project Prioritisation Approach

KEY POINTS:

- Prioritise portfolios of projects within a workstream
- Priority criteria include delivery date, emissions saving.
- Score other criteria to help analysis.
- Use visualisation tools like bubble diagrams.



A method for evaluating and prioritising projects for the portfolio will be required. We believe an approach has been used by the WDC Sustainability Officers Group which would be useful. Representing the results in a bubble chart, as illustrated above, is helpful to give a representation of the results.

The following criteria could be used. This set comes from the WDC Sustainability Officers Group Workshop with some additional criteria added by this report. Weighting of the criteria may change depending on the type of project.

Factors affecting priority:

- GHG abatement potential – this is a measure of how much the project would contribute to the reduction target.

- Cost (CAPEX & OPEX) – an estimate of capital of operational costs, in district multi partner projects this may need to be split between WDC and other parties.
- Level of power and capacity – if generating, the level of power.
- Timescale – when benefits could be delivered.
- Ease of implementation – how easy the project is. This could also cover risks.
- Adaptation / Resilience potential – if an adaptation project, how much does the project contribute to resilience.
- Category historical trends – emissions in some categories are falling due to external influences and may need less support from the district, for example electricity use.
- Ownership of assets – who owns the assets causing the emissions. A different approach will be needed in the private sector as opposed to the commercial sector.
- Equity and social cohesion – and how much the project will contribute to equity and social cohesion.
- Social / political acceptability – likely social and political acceptability.
- Co-benefits - benefits to stakeholders.

There is a need to look at project priority from several perspectives:

- The owner of the asset, if private, is likely to be mostly interested in cost and convenience. Some residents will be engaged in climate change issues; others will not.
- The council has a statutory duty to attend to equity and social cohesion.
- Corporations will have their own sustainability and low carbon action plans.

Measuring, Monitoring and Reporting Workstream

KEY TASKS:

- Derive a robust local GHG emissions measurement method
- Use it to monitor the impacts of initiatives
- Report plans and progress to stakeholders and managers

KEY ISSUES:

- Top down reporting will not always reflect local impacts of action
- Local bottom up GHG footprint may diverge from that produced by SCATTER

This workstream will monitor and measure the performance of mitigation and adaptation actions. It will also compile regular district carbon footprints for reporting purposes.

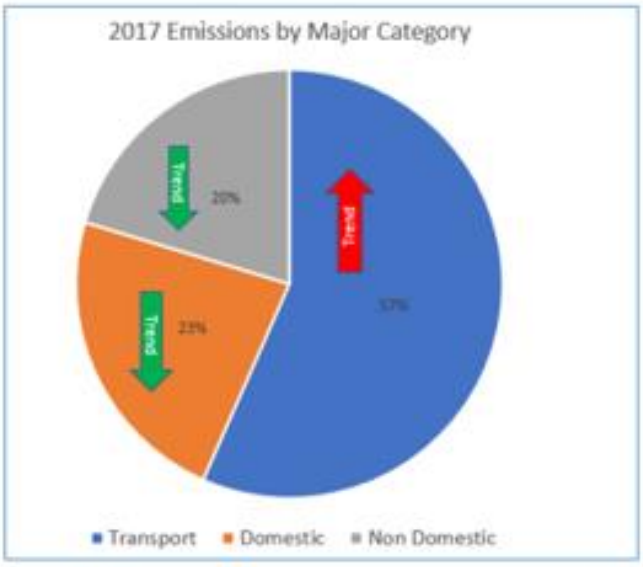
There is an issue with the data in SCATTER (Anthesis 2019b) that some of the emissions for the District are derived 'top down' from national figures. The impact of future local measures may not be reflected in this top down data and in order to get a truer picture of the District's footprint other measuring methods will need developing.

An early task for the programme team will be to investigate measurement and monitoring methods that takes local action into account.

This local GHG emissions measurement method will need to cover both energy usage emissions and emissions related to land use. The WRI Cities GHG Protocol (WRI2017) provides guidance on these measurements and could the mechanism for monitoring the impact of local tree planting projects.

Priority Analysis

Emissions by Major Category



KEY POINTS:

- **Only** covers emissions from **energy use**
- **Transport** is the **largest emissions category**
- Transport emissions trend is rising
- Domestic and Non-Domestic emissions are falling
- But Gas use emissions in those categories is not falling
- **Prioritise Transport and Gas use**

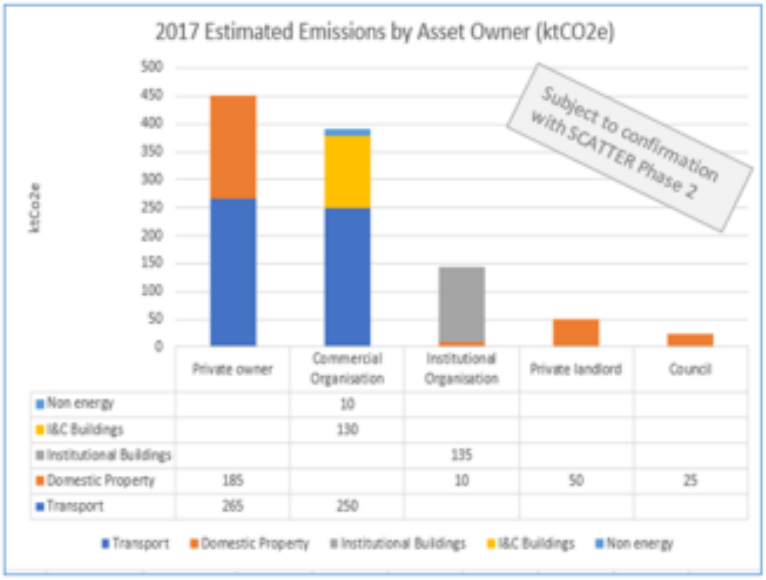
The chart above shows the relative sizes of the three energy emissions categories and what we know of historical trends (source BEIS (2019b) using 2017 data). Note that the only data available in SCATTER currently is for 2017 and it is for government source data used. SCATTER Phase 2 will offer Pathway modelling and will need to provide a way of predicting future trends. It is also recommended that the Programme develops methods of measuring the District's GHG footprint that better reflects the current status of emissions.

Transport emissions represent over 50% of emissions and are known to be rising. The other two static energy categories (domestic and non-domestic) are falling overall but this is due to a reduction in the emissions factor for electricity. Emissions from gas and other fuels remains level. **Note:** It is recommended from this that Transport and Gas use is prioritised in the programme.

Emissions by Asset Ownership

KEY POINTS:

- Most emissions causing assets are in private or commercial hands
- Need different approaches to engagement
- For private owners of property and vehicles, support and advocacy
- Commercial owners may have their own energy and emissions reductions plans



The chart above was developed from 2017 SCATTER data with additional information on ownership of assets. It illustrates some priorities and types of intervention that will be required. This analysis shows that:

- Over 80% of the assets that cause emissions are either in private or commercial hands. These will require different types of engagement and priority. Larger commercial and institutional organisations may have their own energy / carbon management programmes and the District's Climate Action Programme has an opportunity to aggregate the emissions savings in these plans to create a picture of commercial organisations' emissions reduction activity in the District.
- Smaller businesses and private owners will require more priority support as they are less likely to carry out planning themselves.
- The plan for engagement with the private sector will need to be prepared once the Climate Action Programme is in place.
- Financial support for more costly measures will need to be part of budget considerations.

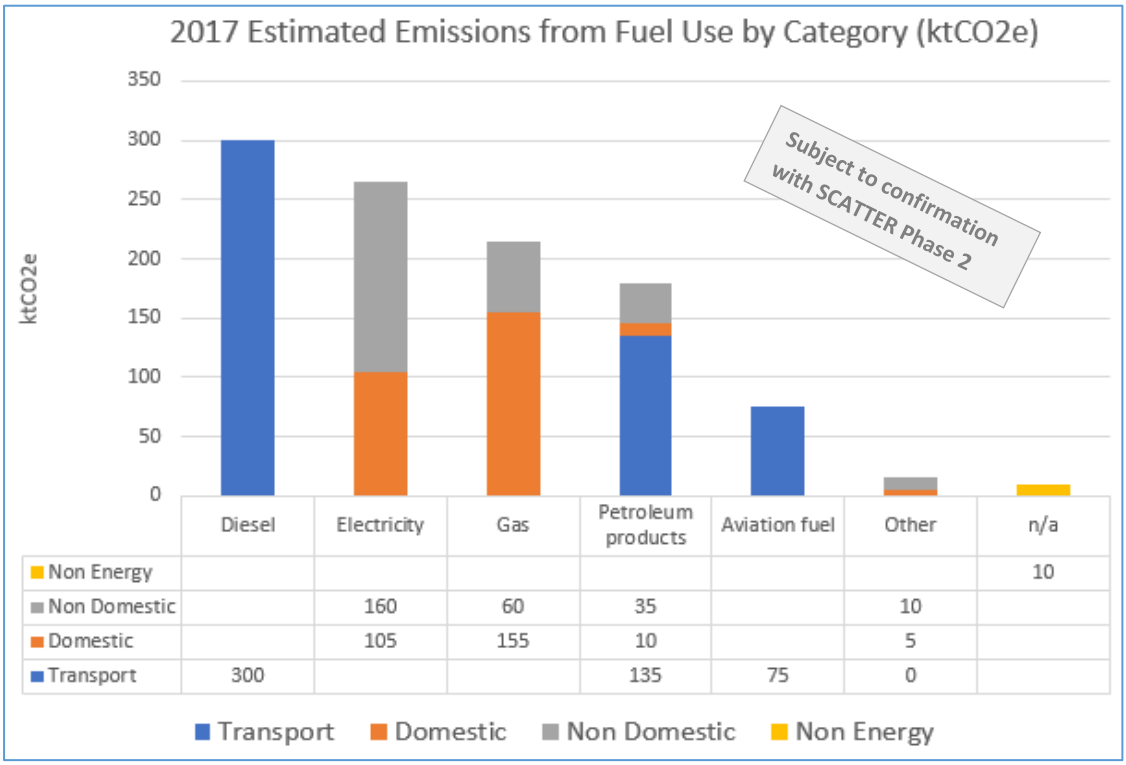
Data source: Anthesis (2019a) "SCATTER Emissions Report for Warwick District". Ownership was added to the SCATTER data records as most appropriate. Road transport records were split proportionally by vehicle type and journey type using "Sub-national road transport fuel consumption statistics, 2005 – 2017" for 2017 (BEIS 2019a). Domestic records were split into ownership using 2011 Census data UK Census Data (2011a) and "Tenure (Key Stats KS402EW) for Warwick District".

Emissions by Fuel Type

KEY POINTS:

- **Diesel combustion for transport is the largest single contributor to emissions**
- **Priority required on gas use for space heating**
- **Lower priority to electricity use as emissions are known to be falling**
- **Commercial organisations may have their own energy and emissions reductions plans**

Another useful perspective on priority is an analysis by fuel use. The chart below is also derived from 2017 SCATTER data and shows the main fuel types and categories where they are used:



Diesel combustion is the highest source of GHG emissions in the District. There are also associated air quality considerations with these emissions.

Electricity is next highest. The fall in the electricity grid emissions factor has led to a fall in these emissions. It is possible that the count of emissions from electricity use in the District may fall further once renewable energy contracts are considered.

Gas usage for space heating follows further in this Report.

SCATTER makes an allocation for aviation fuel use. This is outside of the District's control and will need to be treated as an overhead covered by the emissions budget.

Note: In the further analysis of transport priorities that follows it will be argued from that data analysis that priority should be given to car use, which covers a mixture of diesel and petroleum fuel. Changes in car use particularly for shorter journeys is more in the influence of the council. Road haulage uses diesel exclusively but tends to be over longer distances and will need a regional intervention for change. The Roadmap is intended as an initial recommendation on a direction of travel. It is considered that car use was a useful place to start but recognise that haulage will need to be tackled eventually to address diesel use.

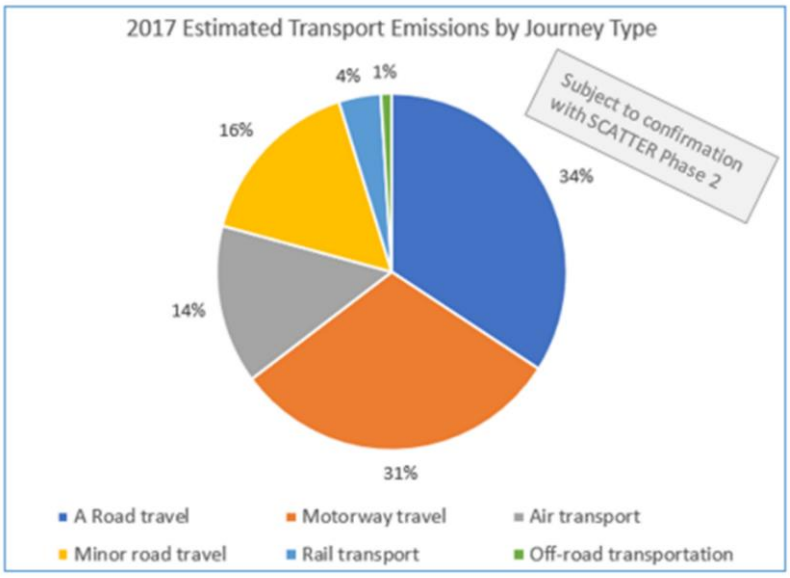
Hydrogen does not feature in the fuel use analysis at the moment due to the very low volumes. It is likely to be an important low carbon measure in the future both in terms of reducing the emissions factor of grid gas and for heavy transport.

Note: Priority should be given to emissions reductions activity in transport and gas use.

Note: Electricity emissions factors are falling and therefore contribute to a decline in emissions. The 2017 SCATTER data uses emissions factors for 2017. This factor has fallen 27% in 2017-2019 and using the latest figure will reduce overall BAU emissions by 6%. Emissions factors taken from "Greenhouse gas reporting factors: 2019" BEIS (2019e).

Data source: Anthesis (2019a) "SCATTER Emissions Report for Warwick District". Ownership was added as most appropriate. Road transport records were split proportionally by vehicle type and journey type using "Sub-national road transport fuel consumption statistics, 2005 – 2017" for 2017. BEIS (2019a). Domestic records were split into ownership using 2011 Census data UK Census Data (2011a) and "Tenure (Key Stats KS402EW) for Warwick District". A fuel used field was added based on the narrative in the SCATTER data table, along with some rationalisation of terms.

Transport sub-categories



KEY POINTS:

- An **estimated reduction of 290 ktCO2e** is required in **2020-2022** to meet the District's Carbon Budget (*subject to confirmation in SCATTER Phase 2*)
- **Priority** needs to be given to action on emissions reduction in **local transport**
- Approx. 50% of emissions are from **Aviation, Motorways and the Railways** and are **not in the scope of local action.**

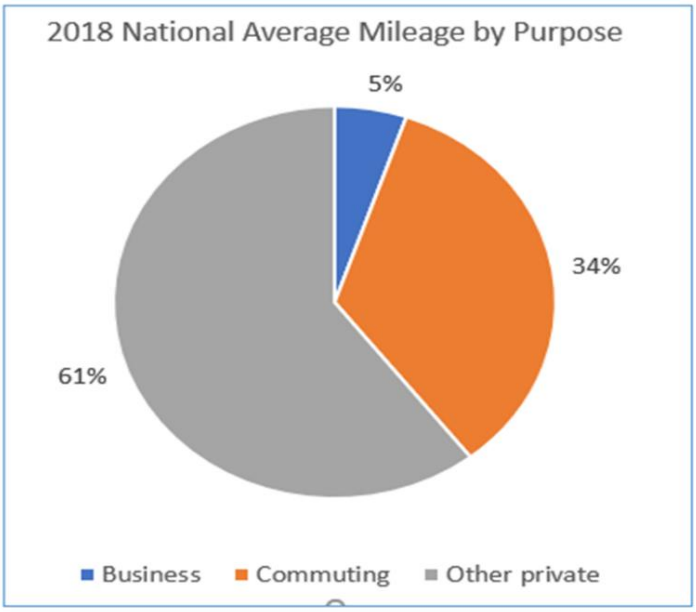
Transport has been identified as the single largest category contributing to Warwick District's GHG emissions. It was considered useful within the scope of this Roadmap to explore transport further to show how more detailed priorities may be developed to meet the estimated 2020-2022 emissions reduction of 290 ktCo2e in transport required to meet the District's Carbon Budget.

The chart above shows the percentage of emissions coming from various types of journey. It is noted that the local ability to influence some of these subcategories are limited. This includes aviation, rail and motorway travel and accounts for approximately 50% of total transport emissions. Local projects to meet the GHG emissions target reduction will need to focus on local travel more.

The Climate Action Programme team would need to partner regionally and nationally to work on emissions that they have less influence on.

Data source: 2017 SCATTER data as referenced previously

Car Journeys



KEY POINTS:

- **Target commuting and other private journeys on local roads**
- Approx. 45% of car emissions come from local journeys.
- The **Transport Assessments** in the **Local Plan** provide much more detail in this subcategory.

The pie chart above shows data on journey purposes at the National level, drawn from a Department of Transport 2018 traffic survey (DfT 2019c). It highlights the significance of commuting and other private journeys.

	A Road travel	Minor road travel	Motorway travel	Total
Bus-Diesel	**1%**	**1%**	**0%**	**2%**
Car-Diesel	**14%**	**7%**	**12%**	**33%**
Car-Petrol	**15%**	**8%**	**8%**	**31%**
HGV-Diesel	**7%**	**0%**	**12%**	**19%**
LGV-Diesel	**6%**	**3%**	**5%**	**14%**
LGV-Petrol	**0%**	**0%**	**0%**	**0%**
Motorcycle-Petrol	**0%**	**0%**	**0%**	**0%**
	42%	**20%**	**38%**	**100%**

The chart above shows emissions from journeys by road and vehicle type for Warwick District. It uses 2017 data taken from “Sub-national road transport fuel consumption statistics, 2005 – 2017”, BEIS (2019a). This shows private cars to be the most significant contributor to emissions in this part of the analysis, covering 44% of journeys on ‘A’ and minor roads.

These insights were used to select measures used in an interim model exploring how the 2020-2022 estimated emissions reduction target for transport could be met, described in the following section.

Transport Workstream

Illustrative Transport Emissions Reduction Strategy

To illustrate how insights into priority measures from the data analysis could be used to explore a scenario for meeting the 2020-2022 interim transport emissions reduction target a spread sheet model was developed. The results from the model need to be confirmed once SCATTER Phase 2 is available, (March 2020). The SCATTER Pathways tool could be used to explore multiple scenarios. This analysis is therefore illustrative only of what will eventually be possible.

KEY POINTS:

- **Estimated emissions reduction target of 290 ktCO2e** in **2020-2022** is required to meet the **Carbon Budget**
- **Priority** to switch to cars use: **switch to battery electric cars, commuting and short journeys**
- Estimated Emissions reductions results from the 20-22 model were: 1) Switch to battery electric cars =245 ktCO2e, 2) low emission commute3s = 30ktCO2e, 3) short journey modal shift = 15ktCO2e



For this scenario, three priority measures for reducing emissions from car use were tested:

a) Switch to electric cars;

b) Reduce emissions from commuting;

c) Encourage modal shift for short journeys.

Haulage traffic and longer journeys were not tested as that requires a regional as opposed to a local approach. SCATTER Phase 2 Pathways will permit a wider and more rapid approach to emissions reduction scenario modelling.

Different percentage contributions were tested, and this indicated that the largest contribution to the emissions reduction target came from the adoption of battery electric vehicles (BEV).

It is emphasised that this is only one possible of the many scenarios that should be explored.

This scenario gave the following results:

- Electric vehicle adoption 245 ktCO2e saving, requires 6,200 drivers switching to electric cars in 2020-2022
- Low emission commutes 30 ktCO2e saving, requires 5,800 commuters switching to low emissions commutes
- Modal shifts for short journeys 15 ktCO2e saving, requires 7,300 travellers regularly switching to low emissions transport for short journeys.

The short distances involved and the larger number of people that would need to make changes is suggested as the reason why the changes in journeys did not provide more significant reductions in emissions. A switch to a battery electric vehicle replaces all of the fossil fuel journeys of that vehicle.

The costs and benefits of these transport emission reduction measures need to be developed further using the methods outlined above. Registration of BEVs is showing an exponential increase as of December 2019 (DfT 2019d) but from a very low base. Achieving 6,200 new BEVs on Warwick District by 2022 would require the local influence d that the Climate Action Programme could provide. This will likely to be in partnership with Warwickshire County Council to ensure all BEV users have easy access to BEV charging points (EVCPs). The current grant award from the Off-Street Charging Fund (OLEV) will boost the existing charge point network – and funding some 30 new public access charging sockets likely to be installed across Warwick District during 2020.

As a sample of the potential projects that could be initiated in the Transport workstream and in order achieve the transport emissions reductions modelled above, the CEAP Programme Team would need to:

- Promote electric vehicles (cars, vans, bikes) and provide information on financing and cost benefits.
- Engage in promoting low emission commuting schemes with local employers.
- Engage in promoting modal shifts – with emphasis upon public transport, cycling and walking.
- Identify capital projects required to support and promote walking and cycling e.g. cycleways; work based changing facilities.
- Another key priority will be to work with WCC and other organisations e.g. Transport for West Midlands; Sustrans; Chiltern Railways on an overall low emissions transport strategy for the District and region which would have wider and more integrated transport emission benefits.

Domestic Workstream

Domestic Workstream and Illustrative Emissions Reduction Strategy



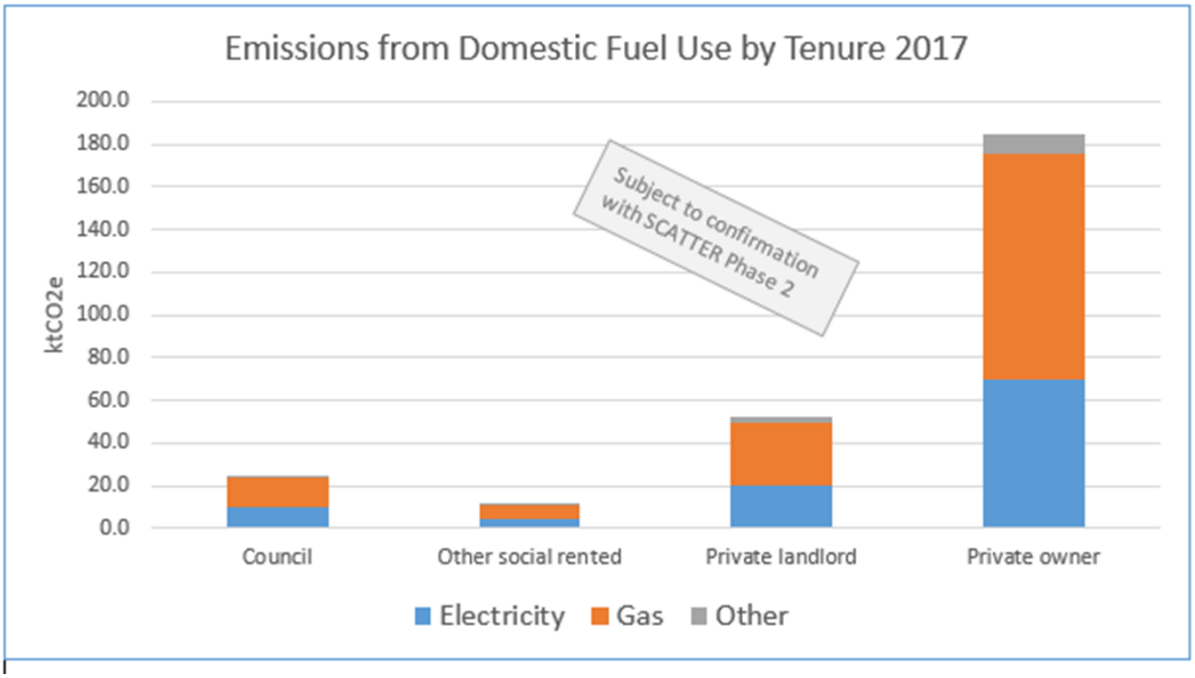
KEY POINTS:

- An **estimated reduction of 150 ktCO2e** is required in **2020-2022** to meet the Carbon Budget.
- **Priority** to reducing emissions from **domestic gas heating systems**
- **Different approaches required** depending on property tenure
- **Household advice critical** to bring about behavioural change especially **for those facing fuel poverty**
- Estimated Emissions reductions results from the 20-22 model were: 1) Historical falling trend = 31 ktCO2e, 2) Reduce gas usage in dwellings = 8 ktCO2e 3) Switch from gas to green electricity for heating = 61 ktCO2e 4) Switch from standard grid to green electricity = 51 ktCO2e

Our interim calculation of the emissions reduction required for the domestic sector to meet the District's Carbon Budget in the 2020-2022 period is 150 ktCO2e.

Note: These results and the analysis from the model described below need to be confirmed once SCATTER Phase 2 is available, (March 2020). This analysis is therefore illustrative only

Analysis of emissions by tenure and fuel type shown in the chart below:



Private properties are the largest contributor and gas the largest fuel user. “Other social rented” refers to housing associations we believe. The data source was 2017 SCATTER data split by tenure using 2011 Census data, UK Census Data (2011a).

Reducing the emissions from the rented stock presents a challenge to the programme as the owners and users of the properties are different and have different priorities. The council is obviously positioned to act on improving its own housing stock. Housing Associations may have their own Carbon /energy reduction programmes that the team can engage with. Private landlords are likely to need more support and guidance. As noted above private owners hold most of the housing stock (nearly 70%) and their involvement in the emissions reduction programme is vital.

In order to explore how the 2020-22 interim emissions target of 150 ktCO2e might be achieved we developed an illustrative spreadsheet model.

Measure chosen from the priorities identified in the data analysis were:

a) Accounting for the historical decline in emissions in the domestic category
b) Reducing gas usage in dwellings
c) Switch from gas to green electricity for heating
d) Switch from standard grid to green electricity

The largest savings shown in this scenario result from switching to green electricity use.

a) Historical falling trend in the domestic category 31 ktCO2e saving assuming a 15% fall in 2020 to 2022
b) Reduce gas usage in dwellings, 8 ktCO2e from reducing emissions by 10%in 10,000 properties in the district
c) Switch from gas to green electricity for heating, 61 ktCO2e from switch space heating in 7800 properties to 100% renewable electricity
d) Switch from standard grid to green electricity, 51 ktCO2e from switching (or accounting for) 10000 properties to 100% renewable electricity contracts

Emissions from the falling historical trend in the category is caused largely by improving equipment efficiency, falling heating demand due to rising temperatures, falling grid emissions factor due to the implementation of large-scale renewables and decommissioning of coal fired power stations

Reducing gas usage in dwelling covers measures to improve energy efficiency in buildings. More work needs to be done to model the likely costs and saving across the District of raising the Building Energy Efficiency.

Switch from gas to green electricity for heating, relates to using heat pumps and solar heaters. There is an issue of cost in switching from Gas to electricity as electricity costs approximately 5 times more that gas. This will need to be done in conjunction with improved efficiency. There are issues to do with access to energy and fuel poverty that will need to be addressed.

Switching from standard grid to green electricity is not currently accounted for in the SCATTER data but is allowed for in WRI's Scope 2 Guidance WRI (2019)
It is possible that residents already have 100% renewable contracts as a result of group energy switching or personal initiatives.

Activities for the domestic category

In order achieve the reductions modelled above the team would need to:

a) Initiate a building energy efficiency programme of information and support for the private sector. This is about making buildings more energy efficient with links to the Carbon Action Fund
b) Include in this a switch from gas heating to electricity and the associated costs and efficiencies. If the switch is to be adopted the programme will need to address the issues of the large difference between gas heating costs and electricity heating (gas is cheaper by a factor of approx. 5). Gas usage will need to be reduced; solutions still require development.
c) Support further group energy switch schemes and find ways to count existing residents with 100% renewable electricity contracts.

Non Domestic Workstream

KEY POINTS:

- This covers industrial, commercial and institutional buildings and use
- An estimated reduction of 170 ktCO2e is required in 2020-2022 to meet the District's Carbon Budget (*subject to confirmation in SCATTER Phase 2*)
- Priority is to engage with commercial and institutional organisations to identify their own energy and emissions reduction plans.
- Aggregate the impacts of the individual organisation's plans to provide a picture of contribution to the District's emissions reduction target

The non-domestic / non-residential workstream will rely to a large extent on the current and future actions of commercial and institutional organisations developing energy and emission reduction plans. There is a role for Warwick District to lead the District's Climate Action Programme in supporting this and aggregating the individual plans into a District picture.

Commercial organisations could also assist with reducing CO2e emissions from commuting through introducing and investment in Green Travel planning. Some of the required 170 ktCo2e in 2020-2022 (interim model subject to confirmation in SCATTER Phase 2) to meet the District's Carbon Budget will come from the existing reduction trend in the category. Other reductions may become apparent as private sector plans are shared.

Offsetting Workstreams



KEY POINTS:

- Could covers **local tree planting and energy projects**
- Policy: members agreed not to purchase carbon credits and only carry out off set activity within the district boundary

Councillors have already agreed not to purchase carbon credits and only wish to conduct offset activities within the District boundary. The council will be planting trees on their own land and offsetting. A standard approach to offsetting needs to be developed.

There are differing views on the role of and priority for offsetting as an emissions reduction strategy. In general, it is recommended at the District level that offsetting is given a lower priority in the strategy than activity to reduce emissions directly. However, it is recognised that specific cases will be made for local projects which are of wider benefit. For example, increasing the tree cover in the District would have wider benefits to the community than just acting as a carbon sink. Local energy projects supported through off-setting will be of environmental, social and financial benefit to the District – as well as providing an important opportunity to engage with the local community.

Adaptation Workstream

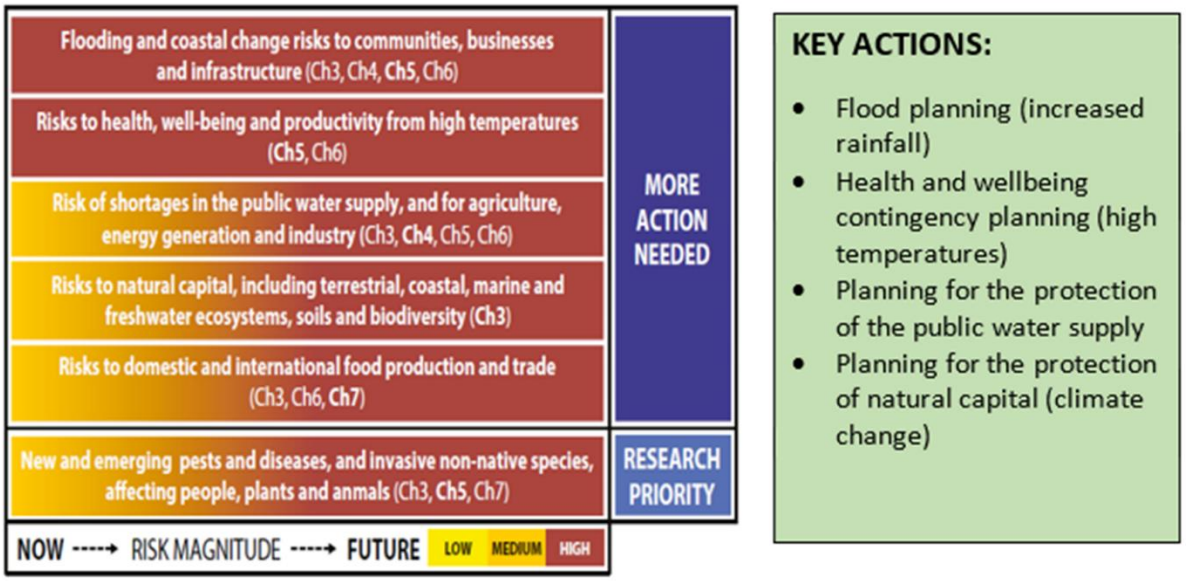


Image Source: UK Climate Change Risk Assessment 2017

Warwick District communities, institutions and businesses will require advice, support and grants to prepare for and manage the consequences of the climate emergency and global heating as it impacts the district.

The Government has prepared the UK Climate Change Risk Assessment 2017, (HMG 2017a) which highlights some key risks relevant to Warwick District. These include flooding, risks to health and natural capital (e.g. wildlife).

We would recommend that the Climate Emergency Action Programme ensures that planning for these risks are covered, contingencies developed – and where appropriate, financial support given.

Climate Emergency Action Programme Roadmap – Activity in 2020

Prior to the establishment of the Climate Action Programme team it is difficult to be too prescriptive about the plan for programme as that will need to be owned by that group. We have identified key actions and recommendation that would support the priorities identified in this Roadmap.

The programme will want to develop plans to cover the full 10 years of the programme and include measures and actions such as to:

- Establish the Climate Emergency Action Programme and review this plan and targets – a first step is to set the team up.

- Establish data set and models using SCATTER Phase 2 – planning and target setting requires data and models which SCATTER will provide.
- Review the results of this Roadmap in SCATTER Phase 2.
- Establish GHG emissions monitoring and reporting – as discussed earlier a method needs to be developed to monitor the impact of measures taken.
- Target action on transport particularly car use and also target gas use in space heating. To be confirmed by SCATTER phase 2.
- Establish community and business engagement as most of the assets are in private or commercial hands. This will require a communications plan.
- Initiate activity with WCC (and others) to establish a Sustainable Transport Plan for the region likely to include:
    - activity to adopt low emissions vehicles;
    - increasing charging point;
    - reducing commuting emissions;
    - promoting modal shifts for short to medium range car journeys.
- Engage with the private sector to include aggregating company low carbon / energy plans, support for commuting changes – assets that are in commercial and institutional hands will be covered by those organisations' energy / emissions plans.

Warwick District Climate Action Programme - Resources Required

It is understood that WDC will be recruiting a Climate Action Strategic Director to manage, coordinate and deliver both the Council's own Carbon Management Plan and the Warwick District Climate Action Programme. The availability of other WDC staff resource will be a determination of the success and timing of the actions proposed in this Roadmap.

The Strategic Director and supporting officers will, in the short term, be planning and developing methods as well as supporting activity by others across the District. While provision should be made in the Council's 2020-2021 budget to provide match funding incentives within a Community Climate Action Fund, the Strategic Director along with senior officers and the Councillor Climate Action Working Group will need to use the next year to develop a more detailed and targeted budget for the 2021-2022 financial year covering capital projects that have been identified, justified and require match funding support.

Appendix (Work Package 3) – References and Resources List

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UKCensusData (2011a) UKCensusData.com (2011). *Tenure (Key Stats) - (KS402EW) for Warwick District*: Tenure (KS402EW).xlsx, Accessed - 02/01/2020, URL= http://www.ukcensusdata.com/warwick-e07000222/tenure-ks402ew

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Glossary and Abbreviations

1.5ºC Temperature rise	This refers to the rise in the average global temperature above the pre-industrial period (pre-1750)
Abatement	In this context, the Greenhouse Gas reduction potential
Adaptation	Actions to reduce vulnerability to climate change impacts, reducing its effects on social, economic and natural systems
BEIS	UK government department of **B**usiness, **E**nergy and **I**ndustrial **S**trategy
BCC	Birmingham City Council
Biodiversity	The variety of animal and plant life on Earth
Business as usual (BAU)	Future emissions trend if the current state of affairs continue as they are today
Carbon Budget	A target for the maximum amount of greenhouse gases that an area or organization can emit in a particular period of time. Warwick District's is 7.5mtCO2e from 2018 onwards (Tyndall).
BEV	Battery Electric Vehicles - an electric vehicle which uses batteries to store the electricity. Electricity is the only form of energy used by these vehicles
Carbon dioxide (CO2)	A key greenhouse gas with a long-lifetime in the atmosphere and both natural and human sources.
CO2e	Carbon dioxide equivalent **-** a standard unit for measuring carbon footprints – expressing the impact of each different greenhouse gas in terms of the amount of carbon dioxide that would create the same amount of warming.
Carbon neutral	Having no net release of carbon dioxide into the atmosphere
Carbon Sink	A feature in the natural environment that absorbs greenhouse gases, for example woodlands
CEAP	Climate Emergency Action Programme including the WDC Carbon Management Plan and the Warwick District Climate Emergency Roadmap
Climate change	The long-term change of climate, typically measured over decades or longer. This is different to weather, which is now.
Climate emergency	Climate change presents the greatest threat to life: on the economy, social well-being and the natural environment
DfT	Department for Transport

Emissions factor	A number used to derive GHG emissions from their sources whether it is fuel or energy use (for example electricity, petrol, gas) or non-energy sources (cattle, de forestation).
EV	Electric Vehicles, a generic term covering all vehicles powered by electricity
Fuel Poverty	Defined by the Warm Homes and Energy Conservation Act as: “a person is to be regarded as living "in fuel poverty" if he/she is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost”
GHG	A gas that contributes to the greenhouse effect by absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface.
GHG Protocol	Accounting and reporting standards for Greenhouse Gas emissions. Those produced by the WRI are widely used.
Hybrid Vehicles	Hybrid Vehicles combine energy from a conventional internal combustion engine with electric traction.
ICE	Internal Combustion Engine
Instruments	In this context refers to the collection of policies and regulations available to the council in the implementation of mitigation measures
ktCO2e	Thousands of tonnes of carbon dioxide equivalent
Local Plan	Sets out the long-term spatial vision for how the towns, villages and countryside in a district will develop and change and how this vision will be delivered through a strategy for promoting, distributing and delivering sustainable development.
Mitigation	Mitigation (of climate change in this context): consists of actions to limit the magnitude or rate of long-term global warming and its related effects. Climate change mitigation generally involves reductions in human (anthropogenic) emissions of greenhouse gases (GHGs). Mitigation may also be achieved by increasing the capacity of carbon sinks, e.g., through reforestation. An aggregation of mitigation policies can substantially reduce the risks associated with human-induced global warming. (Source: Wikipedia with some modification)
Modal Shift	A change from using one type of transport to another. In this context it usually refers to moving from the use of internal combustion engine vehicles to public transport or walking and cycling.
mtCO2e	Millions of tonnes of carbon dioxide equivalent

Natural Capital	Stock of natural resources. In this context within Warwick District.
Natural Environment	Anything occurring naturally and not man made.
Net Zero	Any greenhouse gas emissions are balanced by absorbing an equivalent amount from the atmosphere. Sometimes referred to as 'carbon neutral'
NOx	Term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide and nitrogen dioxide.
Off setting	The reduction of GHG emissions made to compensate for emissions that are made else where
OLEV	Office for Low Emission Vehicles
PID	Project Initiation Document: A document to define a project and form the basis for its management and assessment of overall success. (Source: Managing Successful Projects with Prince2)
Resilience	The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions
SCATTER	**S**etting **C**ity **A**rea **T**argets and **T**rajectories for **E**missions **R**eduction: A Local authority greenhouse gas reporting and modelling tool produced by Anthesis. Phase 2 of the tool (Pathways) will be used by WDC to model the impact on emissions of various mitigation measures in Warwick District.
Scope 1 (Greenhouse Gas emissions)	GHG emissions caused by the consumptions of fuels within the reporting boundary and by emissions from non-energy sources within the reporting area.
Scope 2 (Greenhouse Gas emissions)	GHG emissions caused outside of the reporting boundary by the consumption of electricity and steam imported into the reporting area. This mostly covers electricity use.
Scope 3 (Greenhouse Gas emissions)	GHG emissions caused outside of the reporting boundary by the consumption of food, goods and services within the area.
tCO2e	A metric ton of CO2e: One thousand kilograms CO2e.
ULEV	An 'Ultra Low Emissions Vehicle' refers to any electric or hybrid vehicle that emits less than 75g of carbon dioxide per kilometre travelled, with a capacity of travelling a minimum range of 10 miles with zero CO2 emissions.
WCC	Warwickshire County Council
WP	Work Package

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Appendix 3

Potential Climate Change Projects to call upon the Climate Action Fund (CAF)

i) Helping to reduce household energy bills and fuel poverty by improving the energy efficiency of houses

- Develop a grants scheme for a District wide retro fit and upgrade of energy conservation to EPC C and examine the potential for renewable energy systems in existing private dwellings throughout the District which will improve air quality and reduce the dependency on fossil fuels;
- Encourage Housing Associations and private landlords to bring their properties up to EPC level C as a minimum;
- Set out new and higher standards for energy efficiency in new homes;
- Grant scheme to also support community group to invest in renewable energy projects.
- Installation of water harvesting and 'grey water' systems to reduce water consumption.

ii) Introducing a Sustainable Transport Strategy to reduce congestion and improve air quality

- Park & Ride/Stride projects on the south, north, east and west sides of the Districts towns to alleviate traffic congestion and improve air quality; that will also act as hubs for charging of vehicles, transfer of goods to smaller vehicles, bike hire served by electric or other fuelled buses;
- Develop rail stations as transport interchange hubs, especially Leamington;
- Install a comprehensive EV charging infrastructure throughout the Council's car parking and other assets to encourage adoption of electric vehicles which will improve air quality and reduce carbon emissions; and seek further charge point installations on street and at key journey points of arrival/destination e.g. stations; major employers, tourist attractions; etc.;
- Pump prime or incentivise EV hiring/pool car/car share schemes to reduce short-haul car use in urban areas;
- Roll out bike hire schemes to encourage cycle use and encourage electric bikes in particular;
- Implement a dedicated cycleway system to reduce car dependency and improve the towns' air quality e.g. University to Kenilworth to Leamington cycle superhighway and a Warwick to Draycote Water cycle superhighway; Europa Way e-cycle network to Warwick and Leamington town centres;
- Cooperate with others to install an electric taxi infrastructure to improve the towns' air quality;
- Cooperate with others to install an electric bus infrastructure to improve the towns' air quality;
- Electric buses introduced on key routes, including between the University and Leamington;
- Encourage and incentivise all taxis to become electric;
- Implement a differential free car parking regime for electric cars to encourage their use and improve the towns' air quality.

iii) Helping to improve health and well-being through better housing standards and encouraging more active lifestyles

- Improve waste collection services to increase recycling proportions and reduce the amount sent to landfill;
- Develop a grants scheme for a District wide retro fitting of energy conservation to EPC C or above and encourage renewable energy and heating systems replacement in existing private dwellings throughout the District to improve air quality and reduce the dependency on fossil fuels;
- Encourage Housing Associations and private landlords to bring their properties up to EPC level C as a minimum;
- Set out new and higher standards for energy efficiency in new homes;
- Encourage walking and cycling in the Districts parks and open spaces, e.g. Warwick to Draycote Water cycle superhighway.

iv) Helping to improve the natural 'green' environment by improving the area's biodiversity through tree planting and creating new habitat areas

- A comprehensive 168,000 tree planting programme throughout the District to improve carbon sequestration throughout the District;
- Extend Tach Brook Country Park to create new habitats;
- Create a continuous green park between Warwick and Leamington to include a new Commonwealth Park
- Create other new habitats wooded or otherwise;
- Undertake a comprehensive 'Green Spaces' planting project with self-seeding and drought tolerant plants to improve the District's carbon capture and significantly reduce maintenance journey requirements;
- Encourage permeable surface water surfaces to assist in water management and address potential flooding;
- Installing an urban 'Green Roof' and 'Green Barrier' system within the District's towns' to improve carbon sequestration;
- Phasing out the use of peat to ensure that existing peat beds remain intact to remain as natural carbon sequestration domains.

v) Helping to improve the local economy and create more jobs and businesses by helping companies to reduce energy costs and encouraging a cluster of "environmental enhancing industries and companies" in the District

- Introduce a grant scheme to assist SME's to undertake energy conservation schemes;
- Promote area as a cluster for companies involved in carbon reduction markets e.g. create a "net zero carbon" business park;
- Extend the 'Water Refill' scheme to reduce the use of single use plastics;
- Investment and installation of renewable energy facilities to significantly reduce the use of fossil fuels and improve the District's air quality, including solar farms;
- A LED luminaire replacement project on all of the District's lighting installations to reduce the consumption of fossil fuel and maintenance journey requirement and maintenance costs.