

From: Susan Carey, Cabinet Member for Environment
Simon Jones, Interim Corporate Director of Growth, Environment and Transport

To: Environment & Transport Cabinet Committee – 29 June 2021

Subject: Kent area pathways to Net Zero 2050

Classification: Unrestricted

Electoral Division: All

Summary: This report presents the findings of the Kent and Medway Emissions Analysis and Pathways to Net Zero 2050 report. The report was commissioned to understand the optimum pathway for achieving the Kent and Medway Energy and Low Emissions Strategy’s target of Net Zero by 2050. It recommends an evidence-based carbon budget¹ for Kent and Medway; future emissions pathways defined by a range of interventions; and highlights the scale and speed of implementation needed.

Recommendation(s):

The Environment and Transport Cabinet Committee is asked to note the findings of the Kent and Medway Emissions Analysis and Pathways to Net Zero report and make recommendations to the Cabinet Member for Environment on the proposed approach.

1. Introduction

- 1.1. In response to emerging data, the UK government revised the Climate Change Act 2008 in 2019. This introduced into law a target for the UK to reduce greenhouse gas emissions to Net Zero by 2050. In support of this target, Kent County Council, in partnership with Medway Council and the 12 District/Borough Councils, has led the development of the Kent and Medway Energy and Low Emissions Strategy (ELES), which was approved by the Environment & Transport Cabinet Committee on 17 July 2020. The Energy and Low Emissions Strategy sets a target for emissions from the geographic area of Kent to be reduced to Net Zero by 2050.
- 1.2. To better understand the optimum pathway for reaching Net Zero by 2050, Kent County Council commissioned Anthesis to undertake an analysis of Kent & Medway’s emissions and intervention pathways. Anthesis are specialist consultants who were funded by the Department for Business, Energy, and Industrial Strategy to develop SCATTER; a free tool for local authorities to

¹ A carbon budget is the total amount of carbon dioxide (and other greenhouse gases), that can be released into the atmosphere over a specified period of time. Like a financial budget, if we “spend” too much carbon, we will need to “save” carbon elsewhere to balance the budget. See paragraph 2.4 for more information.

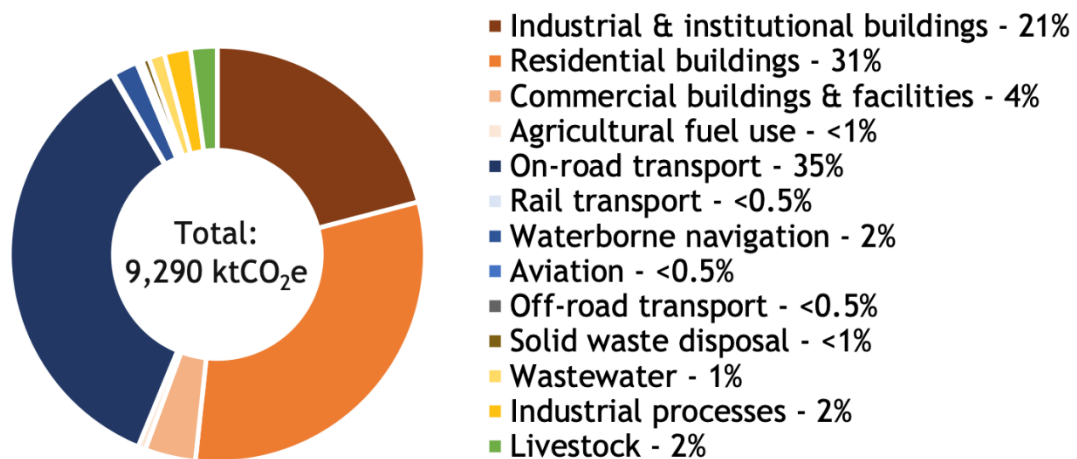
generate greenhouse gas inventories and model emissions reduction pathways. The resulting analysis and report provide:

- The current emissions profile in Kent and Medway.
- An evidence-based carbon budget for Kent and Medway based on academic research at the Tyndall Centre for Climate Change Research.
- Future emissions pathways defined by a range of measures and interventions across the energy system.
- The scale and nature of these interventions and the speed of implementation needed.
- Further in-depth analysis of Kent and Medway's domestic housing, transport, and land use emissions.

1.3. This paper summarises the key findings from the Anthesis report. It is important to note that the report is based on currently available emissions factors, current legislation, and government policy, published emission scenarios and proven technologies. Future changes to legislation, such as the Future Homes Standard and Environment Bill, emerging technologies such as those relating to hydrogen, as well as the long-term impact of COVID-19 on behaviours and the economy have not been modelled or factored into this analysis.

2. Current emissions profile and allocated carbon budget

2.1. Kent and Medway's current greenhouse gas emissions profile was calculated using the Anthesis SCATTER Tool. It estimated that in 2017, Kent and Medway's emissions totalled 9,290 kilotons of carbon dioxide equivalent (ktCO₂e). The majority of emissions are from buildings (56%) and transport (38%), with smaller contributions from waste disposal (2%), industrial



processes (2%) and livestock (2%).

2.2. Land use acts as a net carbon sink for the county, sequestering 333 ktCO₂e from the local environment; equivalent to 4% of the gross total.

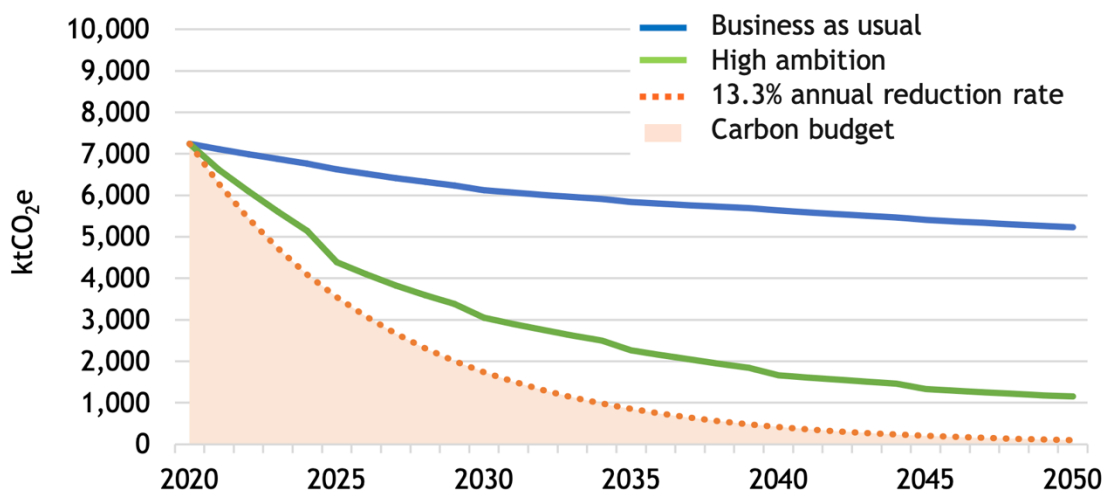
2.3. The calculation includes all emissions arising from sources within Kent and Medway (excluding emissions associated from in-boundary energy

generation, i.e., power stations, to prevent double counting), as well as emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the county. All emissions related to out-of-boundary activities have been excluded (e.g., embodied carbon of products and services).

- 2.4. Carbon budgets set by the government place a restriction on the total amount of greenhouse gases the UK can emit over a 5-year period. Under a system of carbon budgets, every tonne of greenhouse gas emitted between now and 2050 will count. Where emissions rise in one sector, the UK will have to achieve corresponding falls in another. This is to ensure the UK plays its part in limiting global warming to 1.5 degrees Celsius, in line with the Paris Agreement.
- 2.5. The Tyndall Centre for Climate Change Research, based at the University of Manchester, has scaled down the UK carbon budgets into regional budgets for local authorities. They have allocated Kent and Medway a budget of 57,700 ktCO₂e for the period 2020-2050. In order to remain in budget, the county must achieve an average annual emissions reduction rate of 13.3%. To put this in context, the county's average annual reduction rate since 2005 has been just over 3.5%. If reduction rates stay the same, the county will exceed its allocated carbon budget within seven years.

3. Pathways to Net Zero

- 3.1. The SCATTER Pathways tool makes it possible to model future emissions based upon a set of user-defined interventions across various sectors and activities within Kent and Medway. The pathways are intended to act as a line in the sand; focusing on 'what' needs to happen, rather than 'how' we make it happen; and to assist in prioritising interventions that are locally influenceable and necessary to deliver the required reductions in emissions.
- 3.2. Two pathways for Kent and Medway were considered in the report: The business-as-usual pathway (blue line), projects a 44% reduction in emissions by 2050 against 2017 levels. The high ambition pathway (green line), projects an 88% reduction by 2050 against 2017 levels.



- 3.3. The scale of interventions required by 2050 to meet the High Ambition pathway are listed in Appendix 1. Example activities include:
- **Buildings:** thermal efficiency improvements to new-builds and through retrofit of existing buildings, switching away from gas technologies for heating and cooking, energy efficient appliances and lighting.
 - **Transport:** travelling less often and over shorter distances in all vehicles, switching to electric vehicles, modal shift away from private vehicles, improving freight emissions.
 - **Renewable energy supply:** scaling up the installed capacity of renewable technologies such as solar and wind.
 - **Waste and industry:** producing less waste, recycling more and shifting away from carbon-intensive fuels for industrial processes.
 - **Agriculture and land use:** increasing tree coverage and carbon sequestration, improving land and soil management, shifting to less carbon-intensive livestock management.
- 3.4. Under the high ambition pathway, the emissions profile of Kent and Medway is predicted to change significantly but will still not reach carbon neutrality by 2050. It is estimated that annual emissions will be around 1,155 ktCO₂e, with the bulk of emissions at that time coming from domestic buildings (50%) and the industrial and commercial sector (39%). Just 11% of emissions will come from transport; largely freight transport. As noted in paragraph 1.3, unless, and until further technological interventions currently not identifiable become viable, further activities will be needed to inset these residual emissions.

4. Financial Implications

- 4.1. This paper relates to the findings of the Kent and Medway Emissions Analysis and Pathways to Net Zero report and not any costed actions that may be developed in the future as a result of the findings. As projects that Kent County Council are involved in are developed, the supporting evidence and any cost implications will be identified, and the business case developed through the appropriate governance processes.

5. Policy Framework

- 5.1. This paper and the activity within it are directly linked to the Interim Strategic Plan, in particular, the priority to tackle the climate emergency and protect and enhance our natural environment. It is also relevant to the Kent and Medway Growth and Infrastructure Framework, Kent and Medway Economic Renewal and Resilience Plan, Kent and Medway Infrastructure Proposition, Kent Waste Disposal Strategy, Kent Health and Wellbeing Strategy and informs the emerging Local Transport Plan 5.
- 5.2. Developing this approach is an action within the Kent and Medway Energy and Low Emissions Strategy, which forms part of the Kent Environment Strategy and its Implementation Plan.

6. Equalities Impact Assessment

6.1. An Equalities Impact Assessment was undertaken on the Energy and Low Emissions Strategy. Individual projects and programmes agreed as part of the Strategy will conduct their own Equalities Impact Assessment.

7. General Data Protection Regulation Considerations

7.1. A Data Protection Impact Assessment is not needed as the Net Zero approach does not require the processing of personal data.

8. Conclusion

8.1. The Kent and Medway Emissions Analysis and Pathways to Net Zero report highlights the scale and speed of action required across all sectors in order to reach our Net Zero target for the area. It recommends five-yearly carbon budgets for the county and identifies the preferred combination of activities required to achieve our targets.

8.2. Under the framework of the Kent Environment Strategy and the Energy and Low Emissions Strategy, the KCC Sustainable Business and Communities Team is now working with key stakeholders to ensure our priority activities align with the recommended pathways and to identify resource gaps and opportunities. The pathways were also used to inform the Kent and Medway Energy and Low Emissions Strategy Implementation Plan, which was published in May 2021.

8.3. The report is intended to form the basis for deeper conversations and to further support the development of sector specific pathways and action plans. It is critical that key stakeholders continue to be engaged throughout the process, as our targets can only be met through strong partnership working. We must also continue to identify activities that our outside of our direct control or influence, where our leadership role, and ongoing sector engagement and lobbying can be harnessed to encourage meaningful and permanent change.

9. Recommendation(s)

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The Environment and Transport Cabinet Committee is asked to note the findings of the Kent and Medway Emissions Analysis and Pathways to Net Zero report and make recommendations to the Cabinet Member for Environment on the proposed approach.

Background Documents

- Kent and Medway Energy and Low Emissions Strategy – <https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/environmental-policies/kent-and-medway-energy-and-low-emissions-strategy>

- Kent and Medway Emissions Analysis and Pathways to Net Zero (Executive summary) -
https://www.kent.gov.uk/_data/assets/pdf_file/0011/122897/Kent-Emissions-Pathway-Report-Executive-Summary.pdf
- Kent and Medway Emissions Analysis and Pathways to Net Zero (full report) –
https://www.kent.gov.uk/_data/assets/pdf_file/0003/122898/Kent-Emissions-Pathway-Report.pdf

10. Contact details

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Appendix 1: High ambition interventions at 2050

The following table describes the scale of interventions required by 2050 in order to meet the High Ambition Pathway for Kent & Medway. All reductions are against a 2017 baseline except where stated otherwise. The degree to which these interventions can feasibly be achieved at this scale is not considered in the modelling; rather these figures are a demonstration of what needs to be done to meet the High Ambition Pathway.

Sector	Measure	2050 intervention
Domestic buildings	More energy efficient homes & new builds	<ul style="list-style-type: none"> 75,700 “medium” retrofit 605,900 “deep” retrofit 181,300 new builds to PassivHaus standard
Buildings	Reduced energy demand for heating, cooling & hot water	<ul style="list-style-type: none"> Domestic: 43% reduction Non-domestic: 40% reduction
	Reduced energy demand for appliances, lighting, and cooking	<ul style="list-style-type: none"> Domestic: 73% reduction Non-domestic: 25% reduction
	Switching from gas heating systems	<ul style="list-style-type: none"> Domestic: 100% of heating systems are electrified Non-domestic: 80% of heating systems are electrified, remaining 20% supplied by CHP systems
	Shifting from gas to electric cookers	<ul style="list-style-type: none"> Domestic: 84% increase in electric fuel usage for cooking Non-domestic: 33% increase in electric fuel usage for cooking
Transport	Travelling shorter distances	<ul style="list-style-type: none"> 25% reduction in the average number of passenger miles travelled per person
	Driving less	As a percentage of passenger mileage: <ul style="list-style-type: none"> 10% active transport 25% public transport 65% private vehicle
	Switching to electric vehicles	<ul style="list-style-type: none"> 100% of private vehicles, buses and trains are electric (though this transition is heavily frontloaded)

Sector	Measure	2050 intervention
Freight transport	Improving freight emissions	<ul style="list-style-type: none"> • 28% increase in waterborne freight mileage • 22% decrease in road freight mileage • 75% decrease in energy used per mile travelled • 234% increase in fuel use at UK ports for <i>international</i> shipping
Waste	Producing less waste	<ul style="list-style-type: none"> • 57% reduction in the volume of waste
	Increased recycling rates	<ul style="list-style-type: none"> • 85% recycling rate
Industry	Switching from fossil fuels	<ul style="list-style-type: none"> • 15% reduction in oil fuel usage • 2% increase in electricity consumption • 38% increase in the use of natural gas
	More efficient processes	Process emissions reduced: <ul style="list-style-type: none"> • 30% for chemicals • 21% for metals • 25% for minerals • 80% for other industries
Renewable energy supply	Wind	<ul style="list-style-type: none"> • Local wind: 550 MW installed capacity • Large installations (on- and off-shore): 1,466 MW installed capacity
	Solar PV	<ul style="list-style-type: none"> • Local PV: 4,171 MW installed capacity • Large scale PV: 242 MW installed capacity
	Biomass	<ul style="list-style-type: none"> • Declining usage, having displaced fossil fuel sources in power stations
	Other renewables	<ul style="list-style-type: none"> • Local hydro: 69 MW installed capacity • Large-scale hydro: 47 MW installed capacity
Agriculture & land use	Forest coverage & tree planting	<ul style="list-style-type: none"> • Increase in lone tree coverage to around 40 lone trees per hectare • 24% increase in forest coverage
	Land & livestock management	<ul style="list-style-type: none"> • 48% decrease in livestock numbers • 7% decrease in grassland; 1% decrease in cropland