KENT COUNTY COUNCIL

Kent & Medway Emissions Analysis and Pathways to Net Zero

EXECUTIVE SUMMARY

December 2020

Anthesis

White Cliffs at St. Margaret's Bay

Report Overview & Scope

This Executive Summary highlights the key findings from the **Kent and Medway Emissions Analysis and Pathways to Net Zero** report which was commissioned by Kent County Council on behalf of all local authorities in Kent and Medway, who together have committed to reduce greenhouse gas emissions in the area to Net Zero by 2050 at the latest. The report defines:

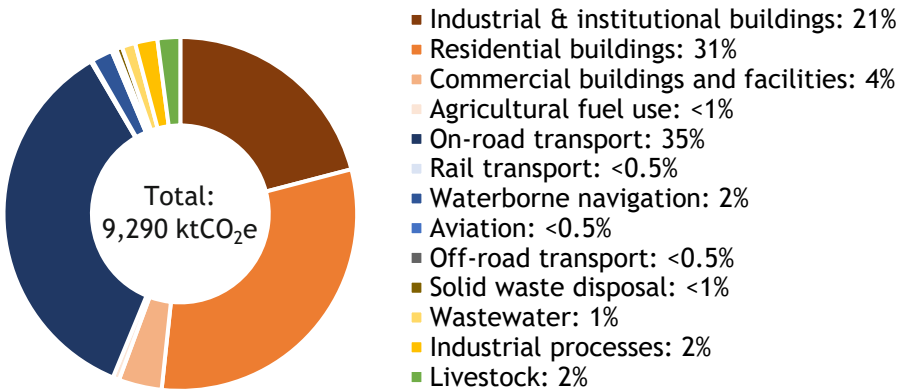
- the current emissions profile in Kent and Medway.
- a science-based carbon budget for Kent and Medway, based on academic research at the Tyndall Centre for Climate Change Research.
- future emissions pathways defined by a range of measures and interventions across the energy system.
- the scale and 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.

Policy context

In 2015, the UK adopted the Paris Agreement, committing to encouraging efforts to limit the increase in global temperatures below 1.5°C and has committed to achieving net zero carbon emissions by 2050. In May 2019, Kent County Council recognised the climate emergency with a declaration of its own Net Zero target for Kent. All local authorities within Kent and Medway have now committed to Net Zero targets.

Current Emissions Profile

Kent's current emissions profile was calculated using the Anthesis SCATTER tool, which allows local authorities to calculate and report their greenhouse gas emissions using international standards.



Land use acts as a net carbon sink for the county, sequestering 333 $ktCO_2e$ from the local environment (equivalent to 4% of the gross total). Kent and Medway is also responsible for 2,317 $ktCO_2e$ of emissions associated with in-boundary energy generation, though these are excluded from the overall emissions profile as per reporting guidelines.

The scope of study of these emissions includes all emissions arising from sources within the county boundary, as well as emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the boundary. All emissions related to out-of-boundary activities have been excluded (e.g. embodied carbon of products and services).

Carbon budget

A carbon budget is a fixed limit of cumulative emissions that are allowed over a given time in order to keep global temperatures within a certain threshold. Carbon budgeting reinforces the importance of cumulative emissions and delivery of carbon reduction measures in the immediate term in order to avert the most serious impacts of climate change.

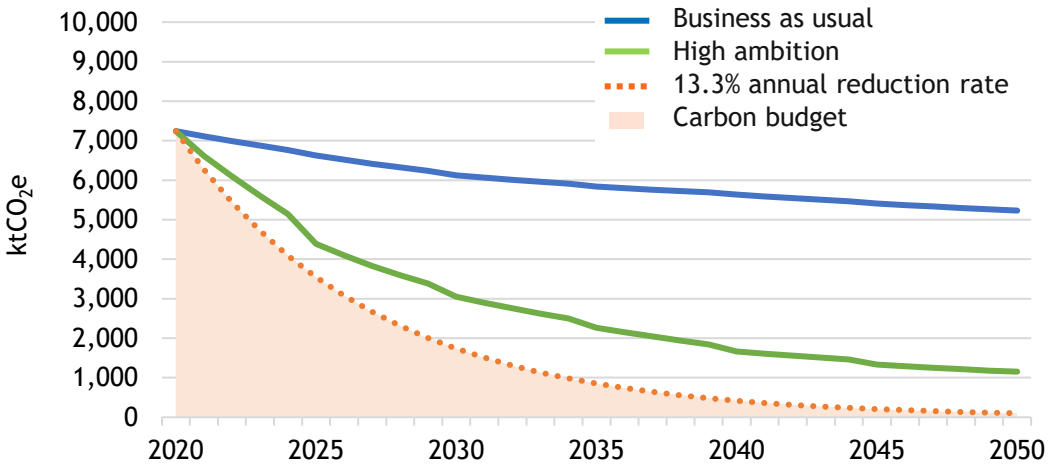
Based on research at the Tyndall Centre for Climate Change Research, Kent and Medway has been allocated a carbon budget of 57,700 $ktCO_2$ for the period 2020-2050 for emissions arising from the county's energy system.

In order to remain in budget, this means the county must achieve an average annual reduction rate of **13.3%** (see beige area opposite). The average annual reduction rate since 2005 was just over 3.5%. At 2017 rates, Kent and Medway will exceed its carbon budget within 7 years.

SCATTER Pathways

SCATTER Pathways is a forward-looking modelling tool which projects future emissions based upon a set of user-defined interventions across various activities within Kent and Medway.

SCATTER Pathways serve as an indication of whether the adoption of certain interventions can drive the transition to a low-carbon economy. Along a business-as-usual pathway (blue line), SCATTER projects a 44% reduction in emissions by 2050 against 2017 levels across Kent and Medway. Along the highest ambition pathway (green line) within SCATTER, Kent and Medway achieves an 88% reduction by 2050 against 2017 levels.



The emissions reduction interventions described in this report correspond to delivery of the High Ambition Pathway (see tables overleaf).

SCATTER Pathways are underpinned by activity across all emissions sectors within the county. Some examples are:

- Buildings: fabric efficiency improvements and switching from gas technologies for heating and cooking.
- Transport: travelling more efficiently, modal shift and phasing out fossil-fuel vehicles.
- Renewable energy supply: scaling up the installed capacity of renewable technologies such as wind and solar PV.
- 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 sequestration potential, shifting to less carbon-intensive livestock management.

Reaching High Ambition at 2050

The following tables describe the scale of interventions required by 2050 in order to meet the High Ambition Pathway for Kent and Medway. All reductions are against a 2017 baseline except where stated otherwise. The degree to which this scale can feasibly be achieved is not considered in this modelling, rather these figures are a demonstration of what needs to be done to meet the High Ambition Pathway. It is intended that the next stages of the action planning process will identify priority areas where the council will need to use its influence to overcome particular barriers in achieving these

Sector	Measure	2050 Intervention
Domestic buildings	More energy efficient homes & new builds	• 75,700 “medium” retrofit • 605,900 “deep” retrofit • 181,300 new builds to PassivHaus standard
Buildings	Reduced energy demand for heating, cooling & hot water	• Domestic: 43% reduction • Non-domestic: 40% reduction
	Reduced energy demand for appliances, lighting and cooking	• Domestic: 73% reduction • Non-domestic: 25% reduction
	Switching from gas heating systems	• 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	• Domestic: 84% increase in electric fuel usage for cooking • Non-domestic: 33% increase in electric fuel usage for cooking
Transport	Travelling shorter distances	• 25% reduction in the average number of passenger miles travelled per person
	Driving less	As a percentage of passenger mileage: • 10% active transport • 25% public transport • 65% private vehicle
	Switching to electric vehicles	• 100% of private vehicles, buses and trains are electric (though this transition is heavily frontloaded)
Freight transport	Improving freight emissions	• 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 *international* shipping

Sector	Measure	2050 Intervention
Waste	Producing less waste	• 57% reduction in the volume of waste
	Increased recycling rates	• 85% recycling rate
Industry	Switching from fossil fuels	• 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: • 30% for chemicals • 21% for metals • 25% for minerals • 80% for other industries
Renewable energy supply	Wind	• Local wind: 550 MW installed capacity • Large installations (on- and off-shore): 1,466 MW installed capacity
	Solar PV	• Local PV: 4,171 MW installed capacity • Large scale PV: 242 MW installed capacity
	Biomass	• Declining usage having displaced fossil fuel sources in power stations
	Other renewables	• Local hydro: 69 MW installed capacity • Large-scale hydro: 47 MW installed capacity
Agriculture & land use	Forest coverage and tree planting	• Increase in lone tree coverage to around 40 lone trees per hectare • 24% increase in forest coverage
	Land and livestock management	• 48% decrease in livestock numbers • 7% decrease in grassland; 1% decrease in cropland

Additional sectoral analysis

Further analysis was completed for the domestic, transport and land use emissions sectors to offer greater visibility on the specific contexts within Kent and Medway and how this relates to emissions reduction.

In the domestic sector, additional modelling for a low-retrofit scenario indicates that the potential for emissions reductions in the domestic sector relies most heavily on improving new-build standards & switching to electrified heating systems.

In the transport sector, additional modelling for a slow EV-uptake scenario indicates that the impact of bringing forward the date of transition to low-carbon transport cuts cumulative transport emissions roughly in half, with other significant contributions coming from improved journey efficiency gains.

In the land use sector, analysis indicates that agricultural emissions observe a 60:40 split between livestock and fertilizer usage. The county is a net carbon sink, however, with forest- and grass-land sequestering 367ktCO_2e & 124ktCO_2e respectively.

Conclusions & next steps

This report is intended to form the basis for deeper conversations and the development of an action plan to prioritise specific projects to implement within Kent and Medway in support of the county's net zero ambition.

It is critical that key stakeholders are engaged throughout the process, as the council cannot achieve its goals without participation from these actors.

Suggested next steps:

1. Define where the Council may influence different emissions sectors directly and indirectly, supported by the current emissions profile to highlight key sources of emissions.
2. Understand the council's ability to influence within each intervention area (e.g. **lobbying, engagement, leaderhip, action**) and identify and engage key external stakeholders such as businesses and the wider public.
3. Use this evidence base to enable discussion on challenges and opportunities across each sector.
4. Develop robust action plan and accountability structure to monitor progress.
5. Develop working groups and governance to share knowledge and best practice across the county.
6. Encourage collaboration within the county's districts and across other councils nationally to share best practice.

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