

**Report to:** Climate, Energy and Environment Committee

**Date:** 4 October 2022

**Subject:** **Carbon Budgets**

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Is this a key decision?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the decision eligible for call-in by Scrutiny?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the report contain confidential or exempt information or appendices?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If relevant, state paragraph number of Schedule 12A, Local Government Act 1972, Part 1:	
Are there implications for equality and diversity?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## 1. Purpose of this Report

- 1.1. To provide information to the members of the Climate, Energy and Environment Committee about the development of proposed carbon budgets for the Combined Authority.

## 2. Information

### Overview

- 2.1 The Combined Authority declared a climate emergency and strengthened the City Region's carbon emission reduction target in July 2019. The strengthened target commits the region to achieve net-zero carbon by 2038, with significant progress by 2030.
- 2.2 The obvious dataset to use for monitoring progress against the target in West Yorkshire is the national level reporting of carbon dioxide and greenhouse gas emissions by local authority reported annually in the Combined Authority's State of the Region report. This national dataset has recently been improved to include a wider range of greenhouse gases.
- 2.3 The improved reporting means that the figures are more in line with those used in the model developed by the Carbon Emissions Reduction Pathways (CERP) study. This has meant that future greenhouse gas emissions

associated with the different scenarios in the CERP model can be reconciled with the national level LA reporting for West Yorkshire and therefore represented in terms of changes in these figures.

- 2.4 From these datasets, carbon budgets, which are consistent with both the CERP scenario pathways and the national level LA reporting, have been developed. These give the total amount of greenhouse gases (in carbon dioxide equivalent terms) which can be emitted while staying within the CERP carbon reduction pathways. These carbon budgets can therefore be used for monitoring progress against the CERP pathways in the State of the Region reporting.

### **National level LA reporting**

- 2.5 This dataset is compiled by the Department for Business, Energy & Industrial Strategy and published annually in June; the most recent figures included are for the year ending 18 months before. It gives emissions for each local authority, broken down by various sectors and subsectors of the economy and covering 16 years. The most recent dataset includes carbon dioxide emissions for 2005 to 2020 inclusive. Historically only carbon dioxide figures have been reported, but the most recent dataset published in June 2022 also includes emissions of methane and nitrous oxide (in terms of carbon dioxide equivalent) for 2018 to 2020. These more recent figures therefore cover approximately 97% of greenhouse gas emissions in carbon dioxide equivalent terms.

### **Future carbon reduction pathways**

- 2.6 The Carbon Emission Reduction Pathways (CERP) study was produced for the Leeds City Region and York and North Yorkshire local enterprise partnerships. It generated a baseline forecast (the likely levels of greenhouse gas emissions if no new action to reduce them is taken) and three possible scenarios to decarbonise the economy by 2038. The three scenarios are:
- **Max Ambition** – This assumes significant electrification of heat, transport and industry supported by enabling technologies such as demand-side response and energy storage. This also includes significant increases in low carbon power generation with accelerated negative emission technologies and ambitious forest planting rates.
  - **High Hydrogen (High H2)** - Promotes large-scale hydrogen use and carbon capture and storage roll-out. The existing gas network is repurposed for hydrogen, enabling significant hydrogen use in buildings, heating, industry, power and transport. This is supported accelerated forest planting and bioenergy production.
  - **Balanced** – Encompasses a balanced mix of technology across all sectors with contributions from hydrogen, electrification, bioenergy, carbon capture and storage, and decentralised energy production.

These scenarios were modelled in terms of their impacts on reductions in greenhouse gas emissions (expressed as a carbon dioxide equivalent figure or CO<sub>2</sub>e).

- 2.7 The scope of the CERP model was slightly different from the national level LA reporting and so the figures generated by the CERP model had to be adjusted to bring them into line. This involved taking account of the omission of aviation from the national dataset as well as some greenhouse gas emissions (F gases, which account for about 3% of carbon dioxide equivalent emissions).
- 2.8 The CERP model covers 2020 to 2040 but it was decided not to use 2020 as the baseline year so the model had to be extended back to 2019. Following the above adjustments, the resulting figures were scaled so that the CERP 2019 total matched the 2019 figure from the national level LA reporting
- 2.9 The Tyndall Centre for Climate Change Research provides a carbon budget tool on its website which automatically generates a carbon budget report for any local authority or collection of local authorities. This suggests what the implications of the United Nations Paris Agreement are for the relevant local authority in terms of reductions of carbon dioxide emissions only. The actual quantification is relatively simple and, for West Yorkshire, suggests reduction of 13.3% per year from 2019 to the end of the century. While the assessment covers carbon dioxide only (so does not include other greenhouse gases), the implications of the annual percentage reduction is easy to represent by simply applying it to the national level LA carbon dioxide equivalent figure reported for 2019.

### **Carbon Pathway Results**

- 2.10 The results of carrying out the above analyses and adjustments are shown in Figure 1. This shows the three CERP carbon reduction pathways, together with the CERP (business as usual) Baseline. The Tyndall proxy line shown is the result of simply reducing emissions by 13.3% per year from 2019 (as suggested in the Tyndall Centre carbon budget report). The national level LA reporting carbon dioxide equivalent figures are shown for 2018-2020 (these are all the years for which these figures are currently available). The CERP scenarios and the Tyndall proxy line were scaled so that the 2019 (base year) figures matched. Historical carbon dioxide emissions for 2010-2020, also from the national level LA reporting, are shown for comparison.
- 2.11 From the national level LA reporting it is clear that 2020 was an unusual year for obvious reasons. Choosing 2019 rather than 2020 as the baseline year for the CERP scenarios ensures that these are not distorted by the 2020 outturn figure. The effect of the downturn in carbon emissions in 2020 is that carbon budgets dipped below all three of the CERP carbon reduction pathways, however the reduction was not quite enough to achieve the Tyndall proxy reduction pathway (the 2019 to 2020 reduction was slightly less than 13.3%).

## **Carbon Budget Results**

- 2.12 The carbon budgets chosen were generally five-year periods but with adjustments so that progress against the Combined Authority target of net-zero carbon by 2038, with significant progress by 2030 could be assessed. The periods chosen can easily be modified if necessary. The table below shows the carbon budget periods chosen along with the total carbon dioxide equivalent emissions (in MtCO<sub>2</sub>e) which can be emitted over these periods while staying within the relevant carbon reduction pathway. Figures for the CERP Baseline scenario are also included for comparison. This information is also shown graphically in Figure 2.

	<b>2019-20</b>	<b>2021-25</b>	<b>2026-30</b>	<b>2031-35</b>	<b>2036-38</b>	<b>2039-40</b>	<b>Total</b>
<b>CERP Baseline</b>	23.7	54.2	49.2	42.4	23.1	14.7	207.2
<b>CERP Max Ambition</b>	23.6	49.5	33.2	17.0	5.8	3.2	132.3
<b>CERP High H2</b>	23.6	52.0	40.0	21.8	8.0	4.4	149.9
<b>CERP Balanced</b>	23.6	51.5	38.8	23.6	8.8	4.5	150.8
<b>Tyndall proxy</b>	22.5	34.7	17.0	8.3	2.8	1.3	86.6

- 2.13 Note that carbon dioxide equivalent emissions from West Yorkshire as reported in the national level LA dataset for 2019 and 2020 were a total of 22.7 MtCO<sub>2</sub>e which is about 1 MtCO<sub>2</sub>e less than each of the CERP derived carbon budgets for this period. This is because 2019 figures were pegged to the national dataset and 2020 was such an unusual year. Future carbon budgets are likely to be more challenging and carbon emissions for 2021 and 2022 might have bounced back to closer to the Baseline.

## **Use of Carbon Budgets**

- 2.14 The development of carbon budgets allows progress in reducing greenhouse gas emissions to be monitored against the CERP carbon reduction pathways, predominantly through the State of the Region reporting. Progress can therefore be used to guide policy development and inform the scale of intervention required. Through the development of carbon impact assessment methodologies, the carbon impact assessments of individual proposals under development will be reported in terms of their carbon impact over similar budget periods. These results can then be compared with carbon budget figures, though the effect of any single intervention is likely to be small compared to the overall carbon budget.
- 2.15 It is recognised that responsibility for greenhouse gas emissions and the policies necessary to affect them are spread widely across different sectors and organisations (including national government). Success (or otherwise) in achieving these carbon budgets is therefore not just the responsibility of the Combined Authority.

### **3. Tackling the Climate Emergency Implications**

- 3.1. The monitoring of carbon emissions and their comparison with carbon budget figures is important to ensure that appropriate progress is being made in tackling the climate emergency. This information can be used to inform future climate policy by giving an indication of success (or otherwise) and whether additional measures are required.

### **4. Inclusive Growth Implications**

- 4.1. The evaluation and setting of carbon budgets do not have a direct impact on inclusive growth, but any measures used to address the climate emergency may have impacts of this kind.

### **5. Equality and Diversity Implications**

- 5.1. The evaluation and setting of carbon budgets do not have a direct impact on equality and diversity, but any measures used to address the climate emergency may have impacts of this kind.

### **6. Financial Implications**

- 6.1. There are no financial implications directly arising from this report.

### **7. Legal Implications**

- 7.1. There are no legal implications directly arising from this report.

### **8. Staffing Implications**

- 8.1. There are no staffing implications directly arising from this report.

### **9. External Consultees**

- 9.1. No external consultations have been undertaken.

### **10. Recommendations**

- 10.1. That the members of the Climate, Energy and Environment Committee note the contents of this report.

### **11. Background Documents**

There are no background documents referenced in this report.

### **12. Appendices**

Graph showing Figure 1 – Carbon Reduction Pathways  
Graph showing Figure 2 – Carbon Budgets

Figure 1 Carbon Reduction Pathways

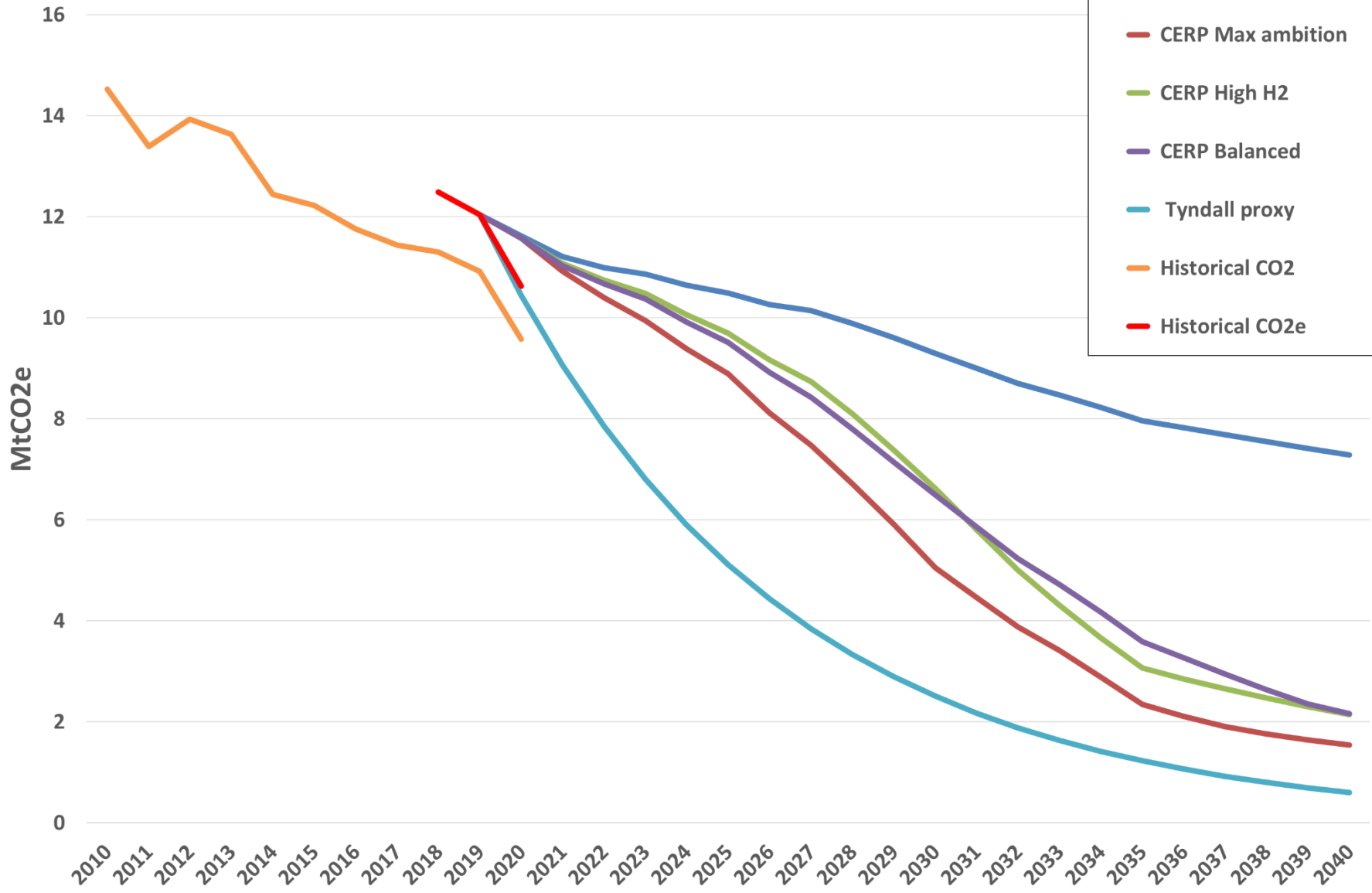


Figure 2 Carbon Budgets

