Climate Change Policy and Scrutiny Committee **8 December 2020**

Report of the Chief Operating Officer

York Emissions Reporting & Carbon Neutral Ambition

Summary

1. This report presents the work undertaken to report on the carbon emissions of City of York Council (CYC) and the City of York to date. Using historical data, it projects emission reductions based on business-as-usual and various intervention scenarios using previously published research.

2. These scenarios are compared with a science based approach to emissions reduction that will likely limit average global temperature increase to within 1.5^{o}C of pre-industrial levels.[1]

3. The scenarios are then compared with each other, using a methodology that considers cost; delivery capacity; integration with local, regional and national policy; and social impact.

4. The projected pathways to net-zero suggest a carbon neutral date between 2034 and 2038 is achievable at lowest cost for the City.

5. All scenarios indicate that residual emissions for the city of York will remain beyond 2040.

Background

6. City of York Council (CYC) announced a climate emergency in March 2019; subsequently setting an ambition for York to be carbon neutral by 2030.

7. The Council will demonstrate leadership in this area and produce a Climate Change Policy which will include a decarbonisation Action Plan for its own operation as well as wider actions for the City.

8. CYC last produced a Greenhouse Gas (ghg) Inventory in 2011/12.This calculated that the Scope 1 & Scope 2 CO_2 equivalent (CO_2e) emissions for the council's operations to be 25,000 tonnes in that year.[2]

[1] IPCC Special Report: Global Warming of 1.5^{o}C (2018) https://www.ipcc.ch/sr15/

9. The nationally available dataset indicates that CO_2e emissions for the whole of York were 1.116 million tonnes during the same period.

Emissions Reporting

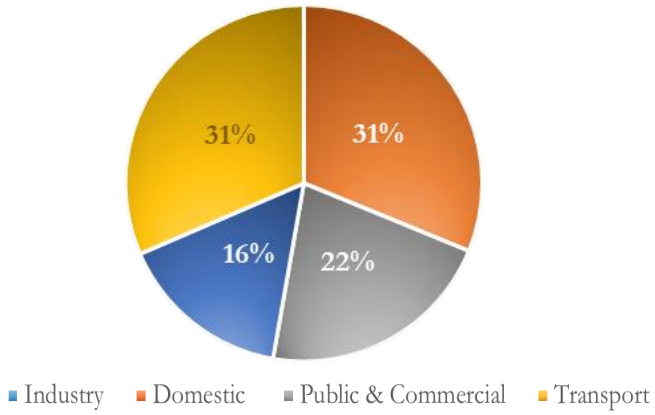
10. Refreshing and regularly reporting on the emissions of CYC and York are important for a number of reasons:
    i. Raising collective consciousness of carbon emissions within both the council and the city
    ii. Provides transparency and accountability
    iii. Emphasises shared ownership of the challenge
    iv. Creates a measure for success
    v. Allows for informed and targeted policy interventions

11. It is proposed that we report emissions for CYC and the national emissions data for York[3] on an annual basis.

12. Work has begun to calculate the CO_2e emissions for CYC in 2019/20. Emissions from our transport fleet have reduced from 2,450t in 2011/12 to 1,800t in 2019/20, a 26% reduction. Emissions from street lighting reduced from 4,142t in 2011/12 to 1,322 in 2019/20, a 68% reduction. A similar process is underway to calculate emissions associated with our corporate buildings to provide the complete picture of scope 1 and 2 emissions.

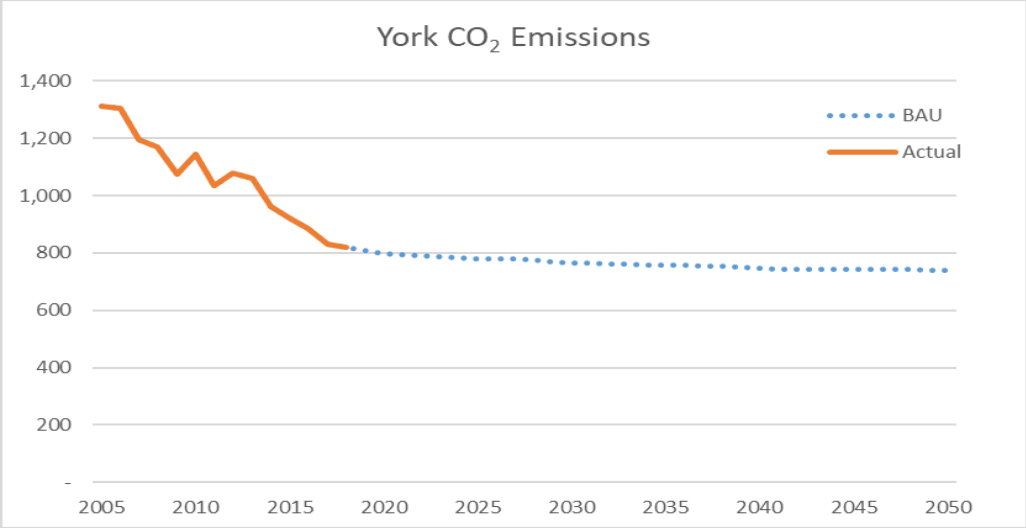
13. Using the most recent data available, emissions across the city have reduced from 1.116million tonnes in 2012 to 821,000t in 2018, a 26% reduction.

14. A sectoral assessment of these emissions shows that Transport and Domestic energy use accounts for almost two-thirds of York's emissions, with Industry and Public & Commercial responsible for the remainder.



15. Based on a 'Business-as-Usual scenario' with anticipated economic and population growth, York would be emitting 764,000t of CO_2e in 2030.

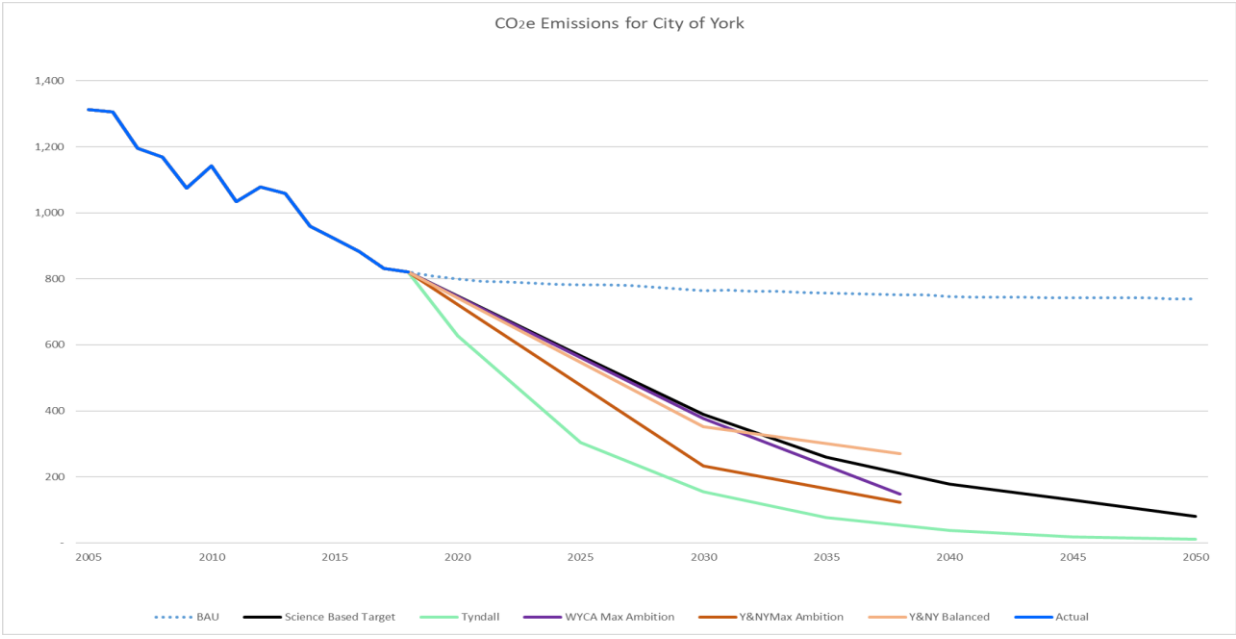
[2] https://www.york.gov.uk/downloads/file/691/coyc-greenhouse-gas-emissions-inventory-2011-12
[3] Most recent data is always for 2-years prior due to the time it takes to compile the dataset



16. A science based approach to setting a carbon budget for York which would reduce the city's carbon emissions to a level that would likely limit average global temperature increase to below 1.5ºC of pre-industrial levels, as recommended by the IPCC, would require a more rapid rate of emissions reduction than currently experienced.

Carbon Abatement Pathways

17. Carbon Abatement Pathways have been produced by various sources over the last 3 years. A summary of these is provided below and compared to the science based carbon budget (produced by Leeds University, 2020)[4]:



* The Tyndall pathway took a science-based approach to calculating the carbon budget for York prior to the IPCC expanded the global carbon budget in 2018[5] and is not considered in further analysis.

* Y&NY Max Ambition scenario includes BioEnergy Carbon Capture and Storage (BECCS) from Drax which is not within scope for York

[4] A Net Zero Carbon Roadmap for York (2020); A. Gouldson et al.
[5] https://www.carbonbrief.org/analysis-why-the-ipcc-1-5c-report-expanded-the-carbon-budget

18. None of the pathways presented achieve zero emissions before 2040. A net-zero target before this date would require carbon offset.

19. The only pathway that would exceed the science based carbon budget for York is York & North Yorkshire's Balanced Scenario.

20. The various local, regional and national net-zero ambition dates are presented below, along with estimated emissions remaining at that date and the associated offset cost[6].

Region	Year	Residual Emissions (tCO_2e)	Estimated Offset Cost	£/person
York	2030	386,000	£4.4m	21
Y&NY	2034	289,000	£3.3m	16
Leeds City Region				
WYCA	2038	209,000	£2.4m	11
UK	2050	80,000	£925,000	4

A Pathway for York

21. There are a number of factors to consider when selecting a carbon neutral pathway for York:

Technical Potential

22. The Maximum Ambition Scenario's for WYCA and Y&NY LEP are dependent on national infrastructure projects such as Hydrogen and Carbon Capture Storage. Estimated delivery dates for these solutions are anticipated to be late 2020's at the earliest, with wider roll-out coming several years later.

23. Without these infrastructure projects, or significant Government investment into heat pumps and sustainable transport well in advance of its own 2050 carbon neutral ambition, it is difficult to see a scenario in which York can achieve carbon neutrality by 2030. It is, therefore, apparent that a pathway to 2030 will require a significant contribution from technologies that are not on stream yet.

24. In the absence of hydrogen or CCS by 2030, alternative technology deployment may be possible; however, this would be at greater cost to York.

[6] Based on average cost of offsetting £11.50/t set by Carbon Earth

Regional Alignment

25. The two sub-regional bodies that York has membership of have set regional carbon neutral targets of 2034 (Y&NY) and 2038 (WYCA). With the anticipation that York may, through the devolution process, become part of York and North Yorkshire Combined Authority, aligning our carbon abatement pathways could present opportunities from regional policy decisions.

Financial Cost

26. An estimated investment of £1.1b - £2.3b will be required to become carbon neutral at a city level. With the current ambition, at the highest assumed cost, this would mean annual investment of £230m, compared with £160m/yr or £130m/yr for a 2034 or 2038 ambition.

27. In addition to the investment costs, the cost of offsetting residual emissions must be considered. While investment will have a direct benefit to York through infrastructure improvements, utility savings and job creation, offset payments are sunk costs. The cost of offsetting residual emissions in 2030 is estimated at £4.4m; compared with £3.3m and £2.4m for 2034 and 2038.

Climate Change Impact

28. Adopting the science based carbon reduction targets would reduce the city's carbon emissions to a level that would likely limit average global temperature increase to below 1.5^{o}c of pre-industrial levels, as recommended by the IPCC.

29. A pathway that achieves this would require the following reductions (based on 2000 levels):

    65% by 2025
    76% by 2030
    84% by 2035
    89% by 2040
    92% by 2045
    95% by 2050

30. Adopting these targets would make both a 2034 and 2038 carbon neutral pathway compatible with the IPCC's 1.5^{o}c limit of warming.

Considerations

31. In response to the climate emergency CYC set an ambition for York to be carbon neutral by 2030. The technical, financial and social impacts of this are now better understood.

32. An ambition for a carbon neutral York by 2030, 2034 or 2038 are all compliant with the IPCC's recommendation for avoiding the most harmful effects of climate change if combined with the science based reduction targets.

33. The estimated investment required for a carbon neutral York by 2030 is £110m - £230m/yr; £78m - £160m/yr for a 2034 deadline; and £61m - £130m/yr for 2038.

34. To achieve carbon neutral, offsetting will be required. The cumulative cost of offsetting residual emissions from 2030 – 2050 is estimated to be £44m; £28m from 2034 – 2050; and £16m from 2038 – 2050.

35. It should be noted that a pathways to 2034 or 2038 create flexibility for the deployment of large-scale infrastructure projects in York that would have a significant impact on reducing carbon emissions of the city at lowest cost – particularly hydrogen CCS. Ensuring a close fit with these pathways creates regional policy alignment and a greater opportunity for regional collaboration.

36. It is both technically and financially possible for the Council to decarbonise its own operations by 2030. However, emissions need to fall significantly to minimise or avoid the need for offset.

Recommendations

37. The Climate Change Policy Scrutiny Committee are requested to consider the evidence for setting a decarbonisation pathway for York and the ambition for making the city carbon neutral ahead of the Climate Change Policy which will be produced in Spring 2021.

Consultation

38. This report and associated documents has been developed in consultation with the WYCA, Y&NY LEP and Leeds University.

Council Plan

39. This report link with the Council Plan 2019-2023 in regard to the following core outcomes of the Plan:
    - A greener and cleaner city – Working towards becoming a carbon neutral city by 2030
    - Getting around sustainably – Cutting congestion, pollution and carbon emissions
    - Good health and wellbeing – Promoting active travel, healthy eating and improving air quality
    - Safe communities and culture for all – Supporting groups who are at greatest risk of climate change
    - Well paid jobs and an inclusive economy – Creating employment opportunities in the green economy

Contact Details

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Report approved: √ **Date: 30.11.20**

Wards Affected: **All** X

For further information please contact the author of the report

Background Papers:

- Council Plan 2019-2023