**Notice of a public meeting of**

**Climate Change Policy and Scrutiny Committee**

**To:** Councillors Vassie (Chair), Baker (Vice-Chair), S Barnes, Fisher, Hook, D Myers, Wann.
Smithson (Co-opted Non-Statutory Member) and Wilcox (Co-opted Non-Statutory Member)

**Date:** Monday, 16 December 2019

**Time:** 5.30 pm

**Venue:** The George Hudson Board Room - 1st Floor West Offices (F045)

## AGENDA

**1. Declarations of Interest**

At this point, Members are asked to declare:

- any personal interests not included on the Register of Interests
- any prejudicial interests or
- any disclosable pecuniary interests

which they may have in respect of business on this agenda.

**2. Minutes** (Pages 1 - 6)

To approve and sign the Minutes of the meeting held on 12 November 2019.

**3. Public Participation**

At this point in the meeting members of the public who have registered to speak can do so. The deadline for registering is **5.00pm on 13 December 2019.** Members of the public can speak on agenda items or matters within the remit of the

Committee.

To register to speak please contact the Democracy Officer for the meeting, on the details at the foot of the agenda.

**Filming, Recording or Webcasting Meetings**
Please note that, subject to available resources, this meeting will be filmed and webcast, or recorded, including any registered public speakers who have given their permission. The broadcast can be viewed at http://www.york.gov.uk/webcasts or, if sound recorded, this will be uploaded onto the Council's website following the meeting.

Residents are welcome to photograph, film or record Councillors and Officers at all meetings open to the press and public. This includes the use of social media reporting, i.e. tweeting. Anyone wishing to film, record or take photos at any public meeting should contact the Democracy Officer (whose contact details are at the foot of this agenda) in advance of the meeting.

The Council's protocol on Webcasting, Filming & Recording of Meetings ensures that these practices are carried out in a manner both respectful to the conduct of the meeting and all those present. It can be viewed at http://www.york.gov.uk/download/downloads/id/11406/protocol_for_webcasting_filming_and_recording_of_council_meetings_20160809.pdf

**4. Refreshing York's Commitment to the Covenant of Mayors for Climate & Energy** (Pages 7 - 24)
This report provides the Committee with information regarding the Covenant of Mayors for Climate and Energy which has been adopted and signed up to by a number of cities across Europe.

**5. Scoping Report on Corporate Review of Poverty in York** (Pages 25 - 32)
This report presents the Committee with a request from the Customer and Corporate Services Scrutiny Management Committee (CSMC) to undertake a review into elements of poverty in the City which fall within the Climate Change Policy and Scrutiny Committee's remit.

**6. Carbon Budgeting** (Pages 33 - 120)

This report introduces a discussion on the challenges and opportunities of Carbon Budgeting. Experts from the Stockholm Environment Institute, Anthesis, and City of York Council will be in attendance to facilitate discussion.

**7. Work Plan 2019/20** (Pages 121 - 122)

To consider the Draft Work Plan for 2019-20.

**8. Urgent Business**

Any other business which the Chair considers urgent under the Local Government Act 1972.


Democracy Officer:

Name: Robert Flintoft
Telephone: (01904) 555704
E-mail: robert.flintoft@york.gov.uk


For more information about any of the following please contact the Democratic Services Officer responsible for servicing this meeting:

- Registering to speak
- Business of the meeting
- Any special arrangements
- Copies of reports and
- For receiving reports in other formats

Contact details are set out above.

**This information can be provided in your own language.**

我們也用您們的語言提供這個信息 **(Cantonese)**

এই তথ্য আপনার নিজের ভাষায় দেয়া যেতে পারে। **(Bengali)**

Ta informacja może być dostarczona w twoim własnym języku. **(Polish)**

Bu bilgiyi kendi dilinizde almanız mümkündür. **(Turkish)**

یہ معلومات آپ کی اپنی زبان (بولی) میں بھی مہیا کی جاسکتی ہیں۔ **(Urdu)**

☎ **(01904) 551550**

This page is intentionally left blank

| City of York Council | Committee Minutes |
|---|---|
| Meeting | Climate Change Policy and Scrutiny Committee |
| Date | 12 November 2019 |
| Present | Councillors Vassie (Chair), Baker (Vice-Chair), S Barnes, Hook, D Myers and Wann |
| Apologies | Councillors Fisher |

## 14. Declarations of Interest

At this point, Members were asked to declare any personal interests not included on the Register of Interests, prejudicial interest or any disclosable pecuniary interests which they may have in respect of business on the agenda.

Councillor Barnes declared a personal interest in relation to item 5 of the agenda, as he worked for an Offshore Renewable Energy company, Catapult.

## 15. Minutes

Resolved: that the minutes of the previous meeting held on the 15 October 2019 be approved and signed by the Chair as an accurate record.

## 16. Public Participation

It was reported that there had been three registrations to speak under the Council's Public Participation Scheme.

Emanuela Buizza spoke about the importance of trees to CO2 reduction. They requested that the Committee recommend to the Executive a complete ban on tree felling on both public and private land. They also requested that the Committee recognise the importance of the Ecological Emergency alongside that of the Climate Emergency.

June Tranmer echoed the previous speaker and noted that more trees are chopped down than are planted. The speaker also raised a concern regarding recycling, noting that residents are often displeased to see their separated waste being merged during collection.

Debby Cobbett requested that the Committee consider a number of recommendations to the Executive including:

- Changing the reimbursement transport policy for staff to not include travel by car or plane;
- The introduction of subsidised public transport passes;
- The introduction of electric charging points;
- Diversifying away from the use of fossil fuels.

**17. Report on Co-Option**

Before Members considered a report outlining the opportunity to co-opt a number of experts and stakeholders onto the Climate Change Policy and Scrutiny Committee, it was noted that Chloe Wilcox, Theo Steele, Amelia Barber, and Maisie Outhart were representatives from Youth Strike for Climate and not Extinction Rebellion. The Committee were also asked to consider the co-option of Terry Smithson from the Yorkshire Wildlife Trust.

The Scrutiny Officer noted that the four members from Youth Strike for Climate would have one place on the Committee and co-optees would be non-voting members of the Committee. Whilst Conservative and Independent Councillors did not currently have a seat on the committee due to City of York Council proportionality rules, it was noted that the Chair could still invite these Members to the Committee as non-voting participants. Finally, it was noted that Members had the option to invite representatives of the Stockholm Environment Institute to meetings on an ad-hoc basis, depending on whose expertise from the institute could support the Committee on particular topics.

Members unanimously agreed to all the recommendations.

Resolved:

i. That the representatives of Youth Strike for Climate Chloe Wilcox, Theo Steele, Amelia Barber, and Maisie Outhart be co-opted onto the Committee.
ii. That Terry Smithson from the Yorkshire Wildlife Trust be co-opted onto the Committee.
iii. That representatives of the Stockholm Environment Institute be invited to meetings on an ad-hoc basis, when appropriate.
iv. That the chair would invite Conservative and Independent Councillors to attend meetings as non-voting members.

Reason: To ensure that the Committee continues to seek the thoughts of key stakeholders and experts on the issues considered.

## 18. One Planet York - Update

Members considered several annexes about One Planet York and were joined by the Chair of One Planet York Mike Bonsall to help guide discussions with the Committee.

Mike Bonsall informed Members about the funding issues currently facing One Planet York and the reliance on external funding to carry out work. Low funding had meant that projects at One Planet York have not been taken forward. They confirmed that they would look at a number of funding options including having a host organisation, if it shared One Planet York's ambitions.

Members noted the importance of One Planet York as a brand leader within the city. In response to Members questions, Mike Bonsall confirmed that the objective for One Planet York in the next 12 months would be four to five projects already happening in the city that could be supported or enhanced by One Planet York coordinating activity for.

The Director of Economy and Place reminded the Committee to consider the role of the third sector as a whole in achieving zero carbon by 2030, as well as what City of York Council could do to support these organisations in achieving this goal.

Resolved:

i. That the information provided be noted.
ii. That the Committee will consider further issues relating to third sector organisations in helping achieve zero carbon by 2030.

Reason: To ensure that the committee are content with the relationship between the Council and One Planet York.

## 19. Specialist Perspectives on Challenges and Opportunities of a Zero Carbon Fleet

The Committee was joined by council officers, as well as Andy Griffiths, (Head of Value Chain Sustainability, Nestlé UK Ltd) and Jon Harman, (Head of Fleet, First Bus York) for a round table discussion on the challenges and opportunities of realising and operating a zero-carbon fleet.

Challenges highlighted included the current limitations on long distance electric freight vehicles, the cost of conversion to none petrol or diesel vehicles (electric buses can cost around twice as much as diesel) due things such as electric battery costs, and current infrastructure for none

petrol and diesel vehicles being currently insufficient across the country as well as in the city. It was noted that bus usage was predominately by those with limited transport options and would need to be able attract those with a wide range of transport options. Specific infrastructure challenges raised in relation to the city included, the current power supply at James Street bus depot and Hazel Court likely being insufficient to be able to charge vehicles if these sites were running full electric fleets.

Opportunities highlighted in the discussion included the council's multifaceted role as a key builder of transport infrastructure and as the legislator for how roads are used in the city. The opportunity to create a more free flowing transport network that priorities how the network is used, the use of and expansion of rail for both public transportation and freight, and the potential for urban consolidation centres or larger national consolidation centre as part of freight solutions. The growing promise of hydrogen fuel cells was noted (viability is a current challenge due to the current technology and infrastructure, but could be a longer term option) and the potential of using bio methane as a pathway to clearer sources of energy. Officers noted current co-operation with other authorities and business to assist in baselining data and identifying areas the council could make a difference. Officers have also been monitoring pilot schemes in other cities, such as London and Aberdeen who have moved to electric refuse vehicles and hydrogen refuse vehicles respectively.

The Committee also discussed on the importance that whole life costing and carbon budgeting could have, as well as, co-operation between organisations to find solutions, and the potential for joint funding of key infrastructure projects could have on achieving zero carbon by 2030.

Resolved:

i. That the Committee noted the discussions held during this session.

Reason: To continue the work and engagement with organisations in the City, to better understand the challenges of achieving a zero-carbon City by 2030.

**20. Work Plan**

Members considered the committee's work plan for the remainder of the 2019/20 municipal year.

Resolved:

i. That the Chair and Vice Chair will discuss with the Scrutiny Officer and City of York Council officers, as to when a report on Carbon Budgeting should be brought to the Committee.

Reason: So that the Committee has an agreed schedule of work in place in order to move forward with its remit.

Cllr C Vassie, Chair
[The meeting started at 5.31 pm and finished at 8.01 pm].

This page is intentionally left blank

**Climate Change Policy and Scrutiny Committee** **16 December 2019**

Report of the Assistant Director – Legal & Governance

# Refreshing York's Commitment to the Covenant of Mayors for Climate & Energy

## Summary

1. This report provides details and information regarding the Covenant of Mayors for Climate and Energy which has been adopted by a number of cities across Europe and continues to grow.

## Background

2. At its meeting on 29 August 2019, the Executive resolved to ask this Committee 'to consider York refreshing its engagement with the Global Covenant of Mayors for Climate & Energy '.

3. The Covenant of Mayors was launched in 2008 in Europe with the ambition to gather local governments voluntarily committed to achieving and exceeding the EU climate and energy targets.

4. More than 9,000 local and regional authorities across 57 countries have signed up, including Bath, Birmingham and Dublin from the United Kingdom.

5. This is in line with committee's remit to support and help deliver the ambition made in the climate emergency motion at Full Council on 29 March 2019.

## Purpose of Covenant

6. In the terms of the Covenant, signatories to it endorse a shared vision for 2050 of accelerating the decarbonisation of their territories, strengthening their capacity to adapt to unavoidable climate change impacts, and allowing their citizens to access secure, sustainable and affordable energy.

7. Signatories also pledge action to support implementation of the EU 40% greenhouse gas-reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change.

8. There are three steps required in signing up to the Covenant of Mayors for Climate and Energy:

   Step 1: Present the Covenant of Mayors for Climate and Energy initiative to Full Council. The commitment document is attached at Annex A.

   Step 2: Once an official resolution has been adopted by Council, the Mayor or equivalent representative of the council must sign the Covenant adhesion form. The covenant adhesion form is attached at Annex B.

   Step 3: After this has been completed, the signed adhesion form must be uploaded to the Covenant of Mayors website.

**Consultation**

9. No consultation has been necessary to produce this report.

**Options**

10. Members can recommend that Full Council sign up to the Covenant of Mayors for Climate and Energy or choose not to take this further.

**Analysis**

11. The Covenant asks the Local Authority to agree to commit to cutting CO2 and greenhouse gases by 40% by 2030 and therefore it's aims align with that of this committee and with the declaration and commitment to becoming carbon neutral by 2030, as agreed at Full Council in March 2019.

12. The Covenant also asks the Council to commit to a Baseline Emissions Inventory, Climate Change Risk and Vulnerability Assessment and a Sustainable Energy and Climate Action Plan. The committee should consider the feasibility of these commitments prior to recommending to Full Council.

## Council Plan

13. The issues raised in this report are linked to Council Plan themes of 'A Greener and Cleaner City' and 'Getting Around Sustainably' as set out in the Council Plan 2019-23.

## Risks and Implications

14. There are no risks or implications arising from the recommendations in this report, as recommendations only request its submission to Full Council.

## Recommendation

15. As stated above, the commitments within the Covenant seem to align with Council's commitment to becoming carbon neutral by 2030. With this in mind, it is recommended that the committee invite Full Council in December to consider signing up to the Covenant.

16. Reason: To ensure that the committee continues to support the Council's pledge to becoming carbon neutral by 2030,

## Contact Details

**Author:**
Chris Elliott
Scrutiny Officer
Tel: 01904 553631
christopher.elliott@york.gov.uk

**Chief Officer Responsible for the report:**
Dawn Steel
Head of Civic, Democratic and Scrutiny Services
Tel: 01904 551030

| | | | |
|---|---|---|---|
| **Report Approved** | ✓ | **Date** | 06/12/2019 |

**Wards Affected:** **All** ✓

**For further information please contact the author of the report**

**Annexes**
Annex A – Covenant of Mayors – Commitment Document
Annex B – Covenant of Mayors – Adhesion Form

This page is intentionally left blank

Covenant of Mayors for Climate & Energy EUROPE

# THE COVENANT OF MAYORS FOR CLIMATE AND ENERGY

***We, the Mayors signing this Covenant, share a vision for a sustainable future - whatever the size of our municipality or its location on the world map. This common vision drives our action to tackle interconnected challenges: climate change mitigation, adaptation and sustainable energy. Together, we stand ready to deliver concrete, long term measures that provide an environmentally, socially and economically stable environment for present and future generations. It is our collective responsibility to build more sustainable, attractive, liveable, resilient and energy efficient territories.***

## WE, THE MAYORS, ACKNOWLEDGE THAT:

Climate change is already happening and is one of the greatest global challenges of our time, calling for immediate action and cooperation between local, regional and national authorities from all over the world;

Local authorities are key drivers of the energy transition and the fight against climate change at the level of governance closest to citizens. Local authorities share the responsibility for climate action with the regional and national levels and are willing to act irrespective of the commitments of other parties. Local and regional authorities in all socio-economic situations and geographical locations stand at the frontline of reducing the vulnerability of their territory to the various impacts of climate change. Although emissions reduction efforts are already underway, adaptation remains a necessary and indispensable complement to mitigation;

Climate change mitigation and adaptation can bring multiple benefits to the environment, society and the economy. Tackled together, they open up new opportunities to promote sustainable local development. This includes building inclusive, climate-resilient, energy efficient communities; enhancing the quality of life; stimulating investment and innovation; boosting the local economy and creating jobs; reinforcing stakeholder engagement and cooperation;

Local solutions to energy and climate challenges help provide secure, sustainable, competitive and affordable energy for citizens and therefore contribute to reducing energy dependence and protecting vulnerable consumers.

Covenant of Mayors for Climate & Energy EUROPE

## WE, THE MAYORS, SHARE A COMMON 2050 VISION TOWARDS:

- Decarbonised territories, thus contributing to keeping average global warming well below 2°C above pre-industrial levels, in line with the international climate agreement reached at COP 21 in Paris in December 2015;
- More resilient territories, thus preparing for the unavoidable adverse impacts of climate change;
- Universal access to secure, sustainable and affordable energy services for all, thus enhancing quality of life and improving energy security.

## TO ACHIEVE THIS VISION WE, THE MAYORS, COMMIT TO:

- Reducing $CO_2$ (and possibly other greenhouse gas) emissions on the territory of our municipalities by **at least 40% by 2030**, namely through improved energy efficiency and the greater use of renewable energy sources;
- Increasing our resilience by adapting to the impacts of climate change;
- Sharing our vision, results, experience and know-how with fellow local and regional authorities within the EU and beyond through direct cooperation and peer-to-peer exchange, namely in the context of the Global Covenant of Mayors.

In order to translate our local authorities' commitments into action, we undertake to follow the step-by-step roadmap as presented in annex I, including the development of a Sustainable Energy and Climate Action Plan as well as regular monitoring of progress.

## WE, THE MAYORS, ACKNOWLEDGE THAT OUR COMMITMENT REQUIRES:

- Strong political leadership;
- The establishment of ambitious long-term objectives going beyond political mandates;
- A coordinated (inter)action between mitigation and adaptation through the mobilisation of all municipal departments involved;
- A cross-sector and holistic territorial approach;
- The allocation of appropriate human, technical and financial resources;
- The engagement of all relevant stakeholders within our territories;
- The empowerment of citizens as key energy consumers, as “prosumers” and as participants in a demand responsive energy system;

Covenant of Mayors for Climate & Energy EUROPE

- Immediate action, notably via "no-regret", flexible measures;
- The implementation of smart solutions to address the technical and societal challenges of the energy transition;
- Regular adjustments of our actions according to monitoring and evaluation findings;
- A combined horizontal and vertical cooperation between local authorities and with all other levels of government.

## WE, THE MAYORS, WELCOME:

- The initiative of the European Commission bringing mitigation and adaptation – both pillars of the fight against climate change – under this single umbrella initiative and further strengthening the synergies with other relevant EU policies and initiatives;
- The European Commission's support for the extension of the Covenant of Mayors model to other parts of the world through the Global Covenant of Mayors;
- The support of the Committee of the Regions, as the institutional voice of EU local and regional authorities, for the Covenant of Mayors and its objectives;
- The assistance provided by Member States, regions, provinces, mentor cities and other institutional structures to local authorities in complying with their mitigation and adaptation commitments under the Covenant of Mayors.

## WE, THE MAYORS, INVITE:

– **OTHER LOCAL AUTHORITIES TO:**

- Join us in the Covenant of Mayors' community;
- Share knowledge and engage in capacity-building activities under the Covenant of Mayors.

– **REGIONAL / SUB-NATIONAL AUTHORITIES TO:**

- Provide us with strategic guidance, policy, technical and financial support in the development, implementation and monitoring of our action plan(s) and related measures;
- Help us foster cooperation and joint approaches for more efficient and integrated action.

Covenant of Mayors for Climate & Energy EUROPE

– **NATIONAL GOVERNMENTS TO:**

- Shoulder their responsibility in tackling climate change and provide appropriate policy, technical and financial support for the preparation and implementation of our local mitigation and adaptation strategies;
- Involve us in the preparation and implementation of the national mitigation and adaptation strategies;
- Ensure appropriate access to financing mechanisms to support local climate and energy action;
- Recognise the impact of our local efforts, take account of our needs and reflect our views in the European and international climate processes.

– **THE EUROPEAN INSTITUTIONS TO:**

- Consolidate policy frameworks which support the implementation of local climate and energy strategies and city-to-city cooperation;
- Provide us with the appropriate operational, technical and promotional assistance;
- Continue mainstreaming the Covenant of Mayors in relevant policies, support programmes and activities of the European Union, whilst involving us in the preparation and implementation phases;
- Continue making funding opportunities available for the implementation of our commitments as well as proposing dedicated project development assistance facilities that help us to develop, tender and launch investment programmes;
- Acknowledge our role and efforts in climate change mitigation and adaptation and share our achievements with the international community.

– **OTHER STAKEHOLDERS[1] TO:**

- Mobilise and share expertise, know-how, technology and financial resources that complement and strengthen our local efforts, scale up capacity-building, foster innovation and boost investment;
- Become active players in the energy transition and support us by getting involved in community action.

[1] E.g. private sector, financial institutions, civil society, scientific community and academia.

Covenant of Mayors for Climate & Energy EUROPE

# ANNEX I

# THE COVENANT OF MAYORS STEP-BY-STEP PROCESS & GUIDING PRINCIPLES

## A COMMON ROADMAP FOR A SHARED VISION:

In order to meet their mitigation and adaptation targets, Covenant of Mayors Signatories commit to a series of steps:

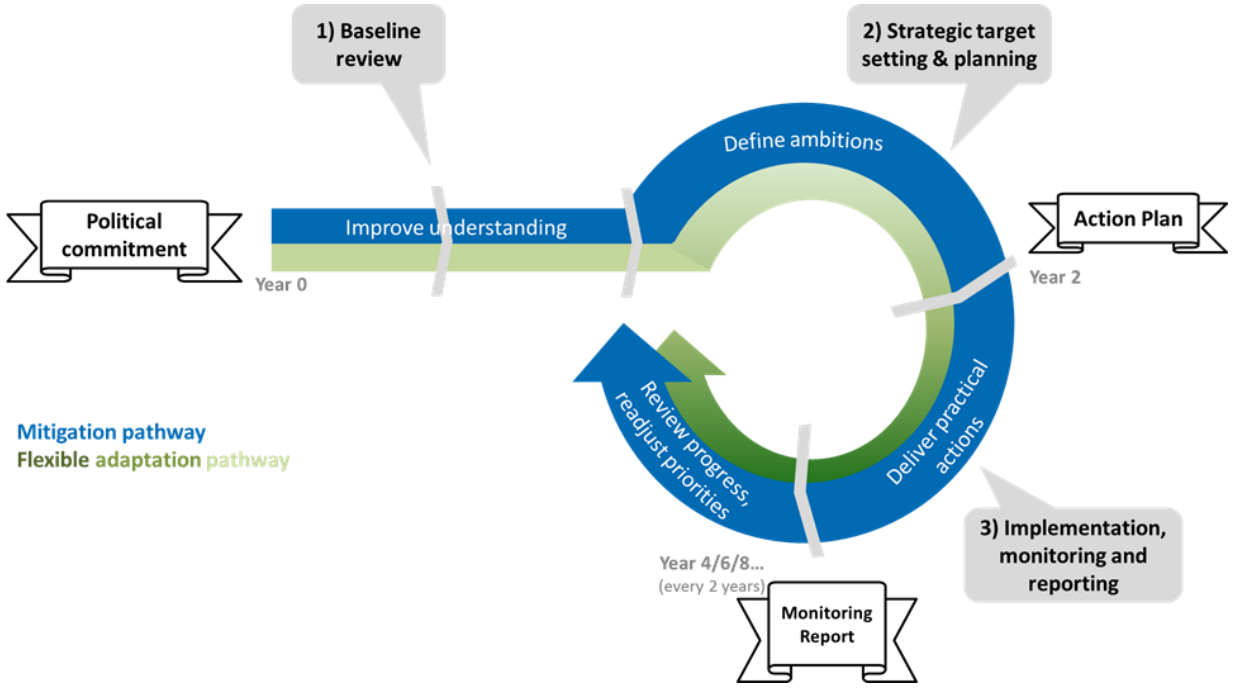
| STEPS \ PILLARS | MITIGATION | ADAPTATION |
|---|---|---|
| **1) Initiation and baseline review** | Preparing a **Baseline Emission Inventory** | Preparing a **Climate Change Risk and Vulnerability Assessment** |
| **2) Strategic target setting & planning** | Submitting a **Sustainable Energy and Climate Action Plan (SECAP)** and mainstreaming mitigation and adaptation* considerations into relevant policies, strategies and plans within two years following the municipal council decision | |
| **3) Implementation, monitoring and reporting** | **Report progress** every second year following the SECAP submission in the initiative's platform | |

** The adaptation strategy should be part of the SECAP and/or developed and mainstreamed in (a) separate document(s). Signatories can opt for the format of their choice – see the "adaptation pathway" paragraph hereafter.*

Years 1-2 shall set the groundwork for the plan, focussing on assessing the situation (main sources of emissions and their respective reduction potentials, main climate risks and vulnerabilities and their associated current/future challenges), identifying the mitigation and adaptation priorities and early wins, strengthening community involvement and mobilising sufficient resources and capacities to undertake the necessary actions. The next years will focus on strengthening and scaling up the actions and projects initiated to accelerate change.

Covenant of Mayors for Climate & Energy EUROPE

## FLEXIBLE PATHWAYS, ADJUSTABLE TO LOCAL REALITIES:




The Covenant of Mayors establishes a framework for action, which helps local authorities to translate their mitigation and adaptation ambitions into reality, while taking into account the diversity on the ground. Flexibility is given to signatory municipalities to choose the best way to implement their local actions. Even if priorities vary, local authorities are invited to take action in an integrated and holistic manner.

– **Mitigation Pathway**

The mitigation 'pathway' accommodates a certain degree of flexibility for signatories – especially for the emissions inventory (e.g. baseline year, key sectors to be addressed, emission factors used for the calculation, emission unit used for the reporting[2], etc.).

– **Adaptation Pathway**

The adaptation 'pathway' is kept flexible enough to integrate new knowledge and findings and reflect changing conditions and capacities of signatories. A climate risk and vulnerability assessment must be conducted within the agreed two-year time frame. The outcomes will lay the groundwork for defining how to make the territory more resilient. The adaptation strategy, which should be integrated into the Sustainable Energy and Climate Action Plan and/or mainstreamed into other relevant planning documents, can be strengthened and readjusted over time. 'No-regret' actions could be considered first and complemented by other actions over the years (e.g. when the situation is reassessed every two years, during the revisions of the action plan) – this will enable adaptation in good time and at a lower cost.

2 Signatories may choose to report their emissions in $CO_2$ (carbon dioxide) or $CO_2$ equivalent. The latter allows them to take into account other greenhouse gas emissions, notably $CH_4$ (methane) and $N_2O$ (nitrous oxide).

Covenant of Mayors for Climate & Energy EUROPE

## A CREDIBLE, TRANSPARENT MOVEMENT:

- **Political endorsement:** The commitment, the Sustainable Energy and Climate Action Plan and other relevant planning documents shall be ratified by resolution / decision of the municipal council. This allows for secured long-term political support.

- **A robust, consistent, transparent and harmonised data compilation and reporting framework:** Based on the experience of municipalities, regions and city networks, the Covenant of Mayors methodology relies on a sound technical and scientific basis developed together with the European Commission. Common methodological principles and reporting templates have been developed, enabling signatories to track, report, and publicly disclose their progress in a structured and systematic manner. The submitted Sustainable Energy and Climate Action Plan is made publicly available on the online signatory profile on the Covenant of Mayors website. This ensures the transparency, accountability and comparability of their local climate actions.

- **Recognition and high visibility of the efforts undertaken:** The individual and collective results collected through the reporting templates are made publicly available – namely on the Covenant of Mayors website – to inspire and facilitate exchanges and self-assessment. Reporting data via the Covenant of Mayors allows signatories to demonstrate the wide impact of their actions on the ground. Data compiled through the Covenant of Mayors reporting framework also gives essential feedback on local actions to national, European and international policy-makers.

- **Evaluation of the data reported by signatories:** This quality control contributes to guaranteeing the credibility and reliability of the whole Covenant of Mayors initiative.

- **Suspension in case of non-compliance:** Signatories accept to be suspended from the initiative – subject to prior notice in writing by the Covenant of Mayors Office – in the event of non-submission of the above-mentioned documents (i.e. Sustainable Energy and Climate Action Plan and Monitoring Reports) within the established deadlines. This procedure ensures transparency, robustness and fairness vis-à-vis other signatories who deliver on their commitments.

Covenant of Mayors for Climate & Energy EUROPE

# ANNEX II

# BACKGROUND & CONTEXT

The Covenant of Mayors signatories commit to the movement in full awareness of the following considerations:

- The Inter-Governmental Panel on Climate Change (IPCC) has re-affirmed in its Fifth Assessment Report that climate change is a reality and that human activities are continuing to affect the Earth's climate;
- According to findings from the IPCC, mitigation and adaptation are complementary approaches for reducing risks of climate change impacts over different time scales;
- National governments agreed within the United Nations Framework Convention on Climate Change (UNFCCC) on a collective goal of keeping global average warming well below 2°C compared to pre-industrial levels;
- National governments agreed in the context of the Rio+20 United Nations Conference on a set of Sustainable Development Goals (SDGs); among which the SDG7 requires the international community to *"ensure access to affordable, reliable, sustainable and modern energy for all"*; the SDG11 requires to *"make cities and human settlements inclusive, safe, resilient and sustainable" and the SDG13 requires to "take urgent action to combat climate change and its impacts";*
- The Sustainable Energy for All initiative, launched by the UN Secretary-General in 2011, focuses on achieving the following three interlinked objectives by 2030: "*ensuring universal access to modern energy services", "doubling the global rate of improvement in energy efficiency"* and *"doubling the share of renewable energy in the global energy mix"*;
- The European Commission (EC) launched the Covenant of Mayors in 2008 and, as a key action of the EU strategy on adaptation to climate change (EC, 2013), the Mayors Adapt initiative in 2014 to engage and support local authorities in taking action to respectively mitigate and adapt to climate change;
- Since its inception, the Covenant of Mayors has been recognised as a key EU instrument, which was notably acknowledged in the Energy Union strategy (EC, 2015) and the European Energy Security strategy (EC, 2014), to accelerate the energy transition and improve the security of energy supplies;
- The EU adopted in October 2014 the 2030 climate and energy policy framework setting new climate and energy targets: at least 40% domestic reduction in greenhouse gas emissions, at least 27% of the energy consumed in the EU from renewable sources, at least 27% of energy savings;

Covenant of Mayors for Climate & Energy EUROPE

- The European Commission adopted in 2011 the "2050 Roadmap for moving to a competitive low-carbon economy" aiming at reducing EU greenhouse gas emissions by 80-95% by 2050 compared to 1990 – initiative also welcomed by the European Parliament and the Council of the European Union.

- The EU Committee of the Regions (CoR) stresses its reinforced commitment to further supporting the Covenant of Mayors, e.g. through a dedicated platform within the CoR and other tools, as outlined in its Opinion on the Future of the Covenant (ENVE-VI-006).

Covenant of Mayors for Climate & Energy EUROPE

# ANNEX III
# GLOSSARY

- **Adaptation:** actions undertaken to anticipate the adverse effects of climate change, prevent or minimise the damage they can cause, or take advantage of opportunities that may arise.
- **Climate change:** any change in climate over time, whether due to natural variability or as a result of human activity.
- **Emissions Inventory:** quantification of the amount of greenhouse gases ($CO_2$ or $CO_2$ equivalent) emitted due to energy consumption in the territory of a Covenant of Mayors signatory during a specific year – it allows identifying the principal sources of emissions and their respective reduction potentials.
- **Mitigation:** actions undertaken to reduce concentrations of greenhouse gases released in the atmosphere.
- **Monitoring Report:** document that Covenant of Mayors signatories commit to submitting every two years after the submission of their SECAP, which outlines the interim results of its implementation – the aim of this report is to track the achievements of the foreseen objectives.
- **No-regret (adaptation) options:** activities providing immediate economic and environmental benefits. They are worthwhile under all plausible climate scenarios.
- **Prosumers:** Proactive consumers, consumers who in addition to consuming energy also assume the responsibility for producing it.
- **Resilience:** ability of a social or ecological system to absorb disturbances while retaining the same basic ways of functioning, and a capacity to adapt to stress and (climate) change.
- **Risk and Vulnerability Assessment:** an analysis that determines the nature and extent of risk by analysing potential hazards and assessing vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend – it allows the identification of areas of critical concern and therefore provides information for decision-making. The assessment could address risks related to floods, extreme temperatures and heat waves, droughts and water scarcity, storms and other extreme weather events, increased forest fires, sea level rise and coastal erosion (if applicable).
- **Risk:** probability of harmful consequences or losses in social, economic or environmental terms (e.g. lives, health status, livelihoods, assets and services) which could occur to a particular community or a society affected by vulnerable conditions over some specified future time period.

Covenant of Mayors for Climate & Energy EUROPE

- **Sustainable Energy and Climate Action Plan (SECAP):** key document in which a Covenant of Mayors signatory outlines how it intends to reach its commitments. It defines mitigation and adaptation actions to achieve the targets, together with time frames and assigned responsibilities.
- **Vulnerability:** degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes (the opposite of resilience).

This page is intentionally left blank

Annex B

I, **[Name of the Mayor (or other equivalent representative)]**, **[Mayor (or Job title)]** of **[Name of the local authority]** have been mandated by the **[Municipal Council (or equivalent decision-making body)]** on **[date]** to sign up to the **Covenant of Mayors for Climate and Energy**, in full knowledge of the commitments set out in the official Commitment Document and summarised below.

Therefore, my local authority principally commits to:

- Reducing $CO_2$ (and possibly other greenhouse gas) emissions on its territory by at least 40% by 2030, namely through improved energy efficiency and greater use of renewable energy sources;
- Increasing its resilience by adapting to the impacts of climate change.

In order to translate these commitments into action, my local authority undertakes to fulfil the following step-by-step approach:

- Carry out a **Baseline Emissions Inventory** and a **Climate Change Risk and Vulnerability Assessment**;
- Submit a **Sustainable Energy and Climate Action Plan** within two years following the above date of the municipal council decision;
- **Report progress** at least every second year following the submission of the Sustainable Energy and Climate Action Plan for evaluation, monitoring and verification purposes.

I accept that my local authority shall be suspended from the initiative – subject to prior notice in writing by the Covenant of Mayors Office – in case of non-submission of the above-mentioned documents (i.e. Sustainable Energy and Climate Action Plan and Progress Reports) within the established deadlines.

**[Name and complete address of the local authority]**

**[Name, e-mail and phone number of the contact person]**

**SIGNATURE**

This page is intentionally left blank

**Climate Change Policy and Scrutiny Committee** **16 December 2019**

Report of the Assistant Director – Legal & Governance

## Corporate Review of Poverty in York

### Summary

1. This report presents the Climate Change Policy and Scrutiny Committee with a request by the Customer and Corporate Services Scrutiny Management Committee (CSMC) to undertake a review into elements of poverty in the City which fall within the Climate Change Policy and Scrutiny Committee's remit, as part of a corporate review of poverty in York.

### Background

2. At the beginning of this municipal year, CSMC agreed to undertake a scrutiny review into food poverty with the aim of understanding the issues around the apparent increasing levels of food poverty in York.

3. An Ad-Hoc Scrutiny Sub-Committee established to carry out the review took advice from experts in this field and it soon became apparent that food poverty, quite simply, correlates to poverty.

4. The sub-committee was reminded that we did not see the notion of food poverty in York before 2010 and there were no food banks in the city at that time. However, food poverty is now a key issue in local communities and stemming potentially from the £30 billion cuts in working age social security since 2010 that are still being rolled out.

5. The roll-out of Universal Credit with delays in payments, cuts in housing benefits, reductions in child tax credit and the working-age benefits freeze are having an impact on many families, including those with working parents. Social security payments are an important safeguard for an increasing number of working family members who are finding that employment does not always provide enough income to support their

families. The increasing cost of living, low and insecure pay, low hours and zero hours contracts could also be contributory factors, as are the cost of Council Tax and cuts in that support

6. It was noted that whilst living/minimum wage regulations were useful, their effect was diminishing with in-work poverty increasing. The expectation should be, that any form of employment would result in more financial security than no employment, however the loss of in-work benefits means that this is no longer necessarily the case.

7. The Council plays a significant role in the city by providing services which help to alleviate poverty. These are either directly or commissioned services. For City of York Council, the services that help alleviate poverty include:

   - Promotion of the take up of statutory benefits (for example Council Tax Benefit)
   - Provision and promotion of discretionary benefits and grant for households in crisis (for example Discretionary Housing Payments and the York Financial Assistance Scheme)
   - Promotion of the take up of Free School Meals
   - Promotion of the take up of early years places for 2 and 3 year olds (many of which offer meals as part of the entitlement)
   - Promotion and provision of training and education to increase skills, increase employment and support individuals to secure higher paid work
   - Support to advice providers to support individuals to maximise household income and access crisis support

8. In the UK 7% of people are in persistent poverty – 4.6 million people. The highest rate of persistent poverty is among lone-parent families.

9. Since work began on the Food Poverty Scrutiny Review the Economy and Place Policy and Scrutiny Committee (E&P PSC) has started to investigate in-work poverty as part of an ongoing exercise to further develop the committee's work programme for the year.

10. In the UK there are now almost four million workers in poverty, a rise of over half a million compared with five years ago and the highest number on record. The employment rate is also at a record high, but this has not delivered lower poverty. Since 2004/05, the number of workers in poverty

has increased at a faster rate than the total number of people in employment, resulting in workers being increasingly likely to find themselves in poverty.

11. Latterly the rise in in-work poverty has been driven almost entirely by the increase in the poverty rate of working parents, which has grown over the past five years. A working parent is now over one-and-a-half times more likely to be in poverty than a working non-parent as most single people and childless couples, however low their wages, earn enough to live above the poverty threshold.

12. In many cases the cause of in-work poverty are long-term changes in the labour market with more self-employment, part-time employment, zero-hours contracts and sporadic employment. The minimum wage is not yet high enough to lift a full-time employed family with one earner above the poverty threshold.

13. CSMC agreed at its November meeting that rather than individual scrutiny committees independently picking up individual aspects of poverty, it makes sense to look at poverty as a whole, with each scrutiny committee focusing on a separate element of poverty to feed into a final corporate report to be drafted by CSMC.

14. The Housing and Community Safety Policy and Scrutiny Committee agreed it would like to take a deeper dive into the delivery of affordable homes on new developments and this work could complement a corporate review into poverty as a whole. Rising housing costs have been largely driven by increasing numbers of low-income families with children living in the private rented sector, due to reduced access to social housing. It is acknowledged that more affordable and social housing could improve the situation for many of York's poorer families.

15. The Children, Education and Communities Policy and Scrutiny Committee has also agreed to take part in a Corporate Review and an informal Task Group was asked to consider a review remit. It this informal Task Group has suggested work to identify the link between socio-economic backgrounds and poverty of opportunity in York.

**Consultation**

16. There has been no consultation in the preparation of this report. However, the ongoing Ad-Hoc Scrutiny Sub-Committee has been advised by experts including an Emeritus Professor of Social Policy at the University of York and from the Joseph Rowntree Foundation while the E&P PSC met with representatives from the University of York,

Joseph Rowntree Foundation, Yorkshire TUC and a major York retailer.

**Analysis**

17. The rationale behind such a corporate review is that while York may appear to be a rich city with a booming tourist industry and relatively low unemployment, poverty is real, and growing, in a climate where food prices and rents continue to rise.

18. Given the link between changes in the benefits system and a rise in poverty in its various forms it is likely that further increases in poverty will be seen in forthcoming years. Department of Work and Pensions intend to transition remaining benefits claimants to Universal Credit between November 2020 and December 2023. In York an estimated 5,600 individuals claiming housing benefit, approximately 3,500 with children, are due to transition. This period of 'managed migration' has potential to have a significant effect on poverty levels within the city.

19. Living in poverty affects every aspect of people's lives and contributes to poorer physical health and being more likely to have poorer mental health issues. According to the Joseph Rowntree Foundation over a quarter of working-age people in the poorest fifth of the population experience depression or anxiety.

20. Nationwide nearly half of children in lone parent families live in poverty. Over the last five years, poverty rates for children in lone-parent families have risen by around twice as much as those for children in couple families.

21. Four million workers live in poverty, a rise of over half a million over five years. In‑work poverty has been rising even faster than employment, driven almost entirely by increasing poverty among working parents.

22. Changes to the UK's housing market have created problems in affording a home for many families and this appears to be the case in York. The impact of these changes can be particularly stark for low-income families with children. For families with children, the proportion of housing costs has grown much faster for those on lower income than for those who are on higher incomes. Rising housing costs have been driven largely by changes in the proportions of families living in different housing tenures. In particular, the fall in home-ownership and expansion of the private rented sector appears to have a greater bearing on low-income families.

## Options

23. Members can agree to undertake a review into poverty elements which fall within the remit of this committee to feed into a corporate review of poverty in York. Members can also agree their own remit for this Committee's review and CSMC suggests the areas the individual scrutiny committees might want to look at could be:

    - **CSMC** – Food poverty
    - **Housing** – Housing poverty including the effects of high rents in the city.
    - **Children, education and communities** – child poverty
    - **Economy and place** – in-work poverty
    - **Health** – the effects of poverty on the health and wellbeing of residents, including mental health
    - **Climate change** – zero carbon as a means of addressing fuel poverty by saving money on energy bills or sustainable travel to improve accessibility to jobs / city centre.

## Council Plan

24. A Corporate Review into poverty in York would take in several priorities already identified in the Council Plan 2019 -2023 including Well-Paid Jobs and An Inclusive Economy; A Greener and Cleaner City; Getting Around Sustainability; Creating Homes and World-class Infrastructure; Good Health and Wellbeing; A Better Start for Children and Young People; An Open and Effective Council and Safe Communities and Culture for All. A copy of these priorities is attached to this report, at Annex A. It is suggested that, wherever possible, the work of Scrutiny Committees should 'dovetail' into those existing priorities, enabling the Council to prioritise its objectives and work collectively to shape and develop them to begin to address the various effects of poverty within the city.

**Implications**

25. There are no Financial, Human Resources, Equalities, Legal, Crime and Disorder, Information Technology, Property or other implications associated with the recommendation in this report.

**Risk Management**

26. There are no risks associated with the recommendation in this report.

**Recommendations**

27. Having considered the information provided in this report Members are asked to consider the priorities for this Committee in contributing to the agreed corporate review on 'poverty' in York and to identify an appropriate remit.

    Reason: To provide a corporate, cross-party response to poverty in the city.

**Contact Details**


| **Author:** | **Chief Officer Responsible for the report:** |
|---|---|
| Steve Entwistle | Suzan Harrington |
| Scrutiny Officer | Interim Assistant Director, Legal & Governance |
| Tel: 01904 554279 | Tel: 01904 55 |
| steven.entwistle@york.gov.uk | suzan.harringtonl@york.gov.uk |


**Report Approved** ✓ **Date** 06/12/2019

**Wards Affected:** **All** ✓

**For further information please contact the author of the report**

**Annexes**

**Annex A** – Council Plan 2019-23

# City of York Council Plan 2019-2023

CITY OF YORK COUNCIL

Working together…

## Well-paid jobs and an inclusive economy

- Deliver a New Economic Strategy
- Review approach to Financial Inclusion
- Align with Make it York on Economic Strategy
- Create a community business representative role
- Develop sustainable and ethical procurement policies
- Align the Adult Skills agenda with the new Economic Strategy
- Promote vocational education in sustainable building
- Work across the region to secure devolution
- Identify options for a Tourist Levy
- Create new commercial spaces

## A Greener and Cleaner City

- A new climate change committee and strategy
- A road map to zero carbon by 2030
- Prioritise street level and environmental services
- Review waste collection options
- Align strategies to protect the environment
- Supplementary Planning Guidance on zero carbon building
- Review single use plastic
- Mitigate and adapt to extreme weather events

## Getting Around Sustainably

- Review city-wide sustainable public transport options
- Lobby for investment in rail connectivity
- Identify options to move fleet to low/zero carbon
- Expand York's electric vehicle charging point network
- Work in partnership to deliver low/zero carbon transport
- Use digital technology to enhance transport systems
- An interchange as part of York Rail Station frontage project
- Implement York's first Clean Air Zone
- Enhanced resident parking and pay-on exit at CYC car parks
- Review potential to extend operation of Park and Ride sites
- identify opportunities to make bus travel more convenient

## Creating Homes and World-class Infrastructure

- Deliver the Local Plan
- Progress the Community Stadium, York Central, Castle Gateway, Guildhall, and Housing Delivery Programme
- Deliver a greater number of affordable homes
- Use the new Design Manual 'Building Better Places'
- Ongoing programme of improvements to Council homes
- Deliver housing to meet the needs of older residents
- Review HMO licensing
- Prioritise support for rough sleepers
- Progress Digital York and enhance connectivity in the city
- Work with York Central Partnership to get the best for York

## Our City Outcomes

Supporting a good quality of life for everybody

## Good Health and Wellbeing

- Contribute to MH, LD and H&WB Strategies
- Improve mental health support and People Helping People
- Support individuals' independence in their own homes
- Continue the older people's accommodation programme
- Support substance misuse services
- Invest in social prescribing, Local Area Coordinators and Talking Points
- Open spaces available to all for sports and physical activity
- Make York an 'Autism friendly' city
- Embed 'Good Help' principles in services
- Safeguarding a priority in all services

## A Better Start for Children and Young People

- Strengthen work to build family resilience
- Continue the improvement of children's social care
- Prioritise improved outcomes for our most disadvantaged
- Work across sectors to improve apprenticeships and in-work progression
- Tackle rise in Mental Health issues
- Focus on Early Years and its impacts
- Give young people access to a full culture and arts offer
- Increase the number of foster carers and adopters
- Improve play and sports provision for young people
- Develop a York Citizenship offer

## An Open and Effective Council

- Ensure strong financial planning and management
- Undertake an Organisational Development programme
- Continued emphasis on absence management and wellbeing
- Deliver the Council's digital programme
- Maintain commitment to apprenticeship programme and real Living Wage
- Design processes around needs to residents, businesses and communities
- Prioritise the delivery of schemes at a ward level
- Use procurement approaches to address climate emergency and secure social value
- Review the Council's current governance structures

## Safe Communities and Culture for All

- Enable communities to take ownership of improving their local area
- Expand the 'People Helping People Scheme'
- Explore social prescribing at a local level to tackle loneliness
- Use MyCityCentre to define for an improved city centre
- Develop the cultural and sporting offer
- Deliver an inclusive cultural strategy
- Support investment in our cultural assets
- Work with the Police and others to make York safer
- Review the Council's approach to equalities

And make a difference

To improve…

# City of York Council Plan 2019-2023

## Key Performance Indicators

These indicators will be used to show us how we are progressing towards the outcomes as a city

| | |
|---|---|
| Good Health and Wellbeing | Adults that are physically active for 150+ moderate intensity minutes per week |
| | % of children in Reception recorded as being obese |
| | Overall satisfaction of people who use services with their care and support |
| | Healthy Life expectancy at birth - Female / Male (slope Index). |
| | Proportion of adults in contact with secondary MENTAL health services living independently |
| | Adult Social Care - attributable Delayed Transfers of Care |
| Well-paid jobs and an inclusive economy | Median earnings of residents - Gross Weekly Pay |
| | Business rates - rateable Value |
| | % of working age population in employment (16-64) |
| | New jobs created |
| | % of vacant city centre shops compared to other cities |
| | % of working age population qualified - to at least L4 and above |
| | % of working age population qualified - to at least L2 and above* |
| | GVA (Gross Value Added) per head (£) |
| Getting around sustainably | P&R Passenger Journeys / Local bus passenger journeys |
| | Area Wide Traffic Levels (07:00 -19:00) (Excluding A64) |
| | Index of cycling activity (12 hour) / % of residents actively cycling and national comparisons |
| | Index of pedestrians walking to and from the City Centre (12 hour in and out combined) |
| | % of customers arriving at York Station by sustainable modes of transport |
| | % of ROAD and pathway network that are grade 4 and below (poor and below) - Roadways / Pathways |
| A Better Start for Children and Young People | %pt gap between disadvantaged pupils (eligible for FSM in the last 6 years, looked after and adopted from care) and their peers achieving 9-4 in English & Maths at KS4 |
| | % of 16-18 year olds who are NEET who do not have L2 qualification |
| | Secondary school persistent absence rate |
| | Voice of the Child - 2 Indicators (Service usage / Life opportunities) |
| | % of children who have achieved a Good level of Development (GLD) at Foundation Stage |
| | GCSE Results ("% of pupils achieving 9-4 in English and Maths at KS4) |
| | Education Progression (Average Progress 8 score from KS2 to KS4) |

| | |
|---|---|
| A Greener and Cleaner City | % of Talkabout panel who think that the council are doing well at improving green spaces |
| | No of trees planted (City and Council level Indicator) |
| | % of Household waste that is sent for reuse, recycling or composting |
| | Residual (non-Recyclable) household waste (kg per HH) |
| | Incidents - Flytipping / Rubbish / Cleansing (includes dog fouling, litter) / Graffiti - On Public/Private Land |
| | Citywide KPI on air quality |
| | Carbon emissions across the city |
| | Level of CO2 emissions from council buildings and operations (Net emissions) |
| | Flood Risk properties assesed at lower level than 2019 baseline |
| Creating homes and World-class infrastructure | Average number of days to re-let empty Council properties (excluding temporary accommodation) |
| | Net Additional Homes Provided |
| | Net Housing Consents |
| | Number of new affordable homes delivered in York |
| | Superfast broadband availability / Average Broadband Download speed (Mb/s) |
| | Energy efficiency: Average SAP rating for all Council Homes |
| | Number of homeless households with dependent children in temporary accommodation |
| Safe Communities and culture for all | Number of Incidents of ASB within the city centre (ARZ) |
| | % of Talkabout panel satisfied with their local area as a place to live |
| | % of Talkabout panel who agree that they can influence decisions in their local area |
| | % of Talkabout panel who give unpaid help to any group, club or organisation |
| | All Crime per 1000 population |
| | Visits - All Libraries / YMT |
| | Parliament Street Footfall & Secondary Centre Footfall |
| An open and effective Council | Forecast Budget Outturn (£000s Overspent / -Underspent) |
| | Average Sickness Days per FTE - CYC (Excluding Schools) |
| | Number of days to process Benefit claims (currently Housing benefit) |
| | Customer Services Waiting Times (Phone / Footfall / Webchat / Satisafction etc) |
| | % of complaints responded to within timescales |
| | CYC Apprenticeships |
| | FOI & EIR - % In time |

**Climate Change Policy and Scrutiny Committee** **16 December 2019**

Report of the Assistant Director – Legal & Governance

## Carbon Budgeting

### Summary

1. This report introduces a discussion on the challenges and opportunities of Carbon Budgeting. This agenda item will look to explore the nature of Carbon Budgeting and the committee will be assessing the impact of what this would look like in York. Experts from the Stockholm Environment Institute, Anthesis and City of York Council will be in attendance to facilitate discussion.

### Background

2. This agenda item has been mentioned in previous meetings of the Climate Change Policy and Scrutiny Committee and was originally planned for the November meeting. In order to give this topic the time and attention that the committee desired, it was decided that it would instead come to this meeting of the committee.

3. For this agenda item, the committee will be joined by Debbie Mitchell (Corporate Finance and Commercial Procurement Manager, CYC), Sara Telahoun (Anthesis) and Jon Green (Stockholm Environment Institute).

4. To further assist the committee in their discussion and to help provide some background information, the Carbon Management Plans for the cities of Manchester, Leeds, Bristol and Copenhagen are attached to this report. Furthermore, the Tyndall Centre's Report on Setting Climate Commitments for York has also been attached for information.

### Consultation

5. No consultation was necessary in the production of this report.

## Options

6. Members can decide whether they would like to take forward into their work plan, any items or issues that come out of their discussion with colleagues during this session.

## Analysis

7. There was no analysis necessary in this report.

## Council Plan

8. The issues that will be discussed in this session are linked to the Council Plan themes of 'A Greener and Cleaner City' and 'Getting Around Sustainably', as set out in the Council Plan 2019-23.

## Risks and Implications

9. There are no risks or implications arising from the recommendations in this report.

## Recommendation

10. The Committee is asked to reflect on discussions held during this session and decide whether they would like to take forward any related items into their work plan.

    Reason: To continue the work and engagement with organisations to better understand the challenges of achieving a zero-carbon City by 2030.

## Contact Details

**Author:**
Chris Elliott
Scrutiny Officer
Tel: 01904 553631
christopher.elliott@york.gov.uk

**Chief Officer Responsible for the report:**
Dawn Steel
Head of Civic, Democratic and Scrutiny Services
Tel: 01904 551030

| | | | |
|---|---|---|---|
| **Report Approved** | ✓ | **Date** | 06/12/2019 |
| **Wards Affected:** | | **All** | ✓ |

## For further information please contact the author of the report

## Annexes

Annex A – Quantifying the Implications of the Paris Agreement – City of Manchester

Annex B – Leeds Climate Commission – Carbon Roadmap

Annex C – Carbon Management Plan 2013-20 – Bristol

Annex D – Copenhagen - Carbon Neutral by 2025

Annex E – Setting Climate Commitments for York – Tyndall Centre

This page is intentionally left blank

TyndallManchester
Climate Change Research

# Quantifying the implications of the Paris Agreement for the city of Manchester

**Client:** Manchester Climate Change Agency
**Document Reference:** MCCA Final
**Version:** 1
**Date:** **July 2018**
**Prepared by:** Dr Jaise Kuriakose, Prof Kevin Anderson, Dr John Broderick & Dr Carly McLachlan

**NB**: All views contained with this report are attributable solely to the authors and do not necessarily reflect those of researchers within the wider Tyndall Centre.

# 1 KEY MESSAGES

The development of post-2017 carbon budget ranges and carbon emissions pathways for Manchester City builds on detailed research (e.g. Anderson and Bows (1)), transposing the 2°C temperature target and equity commitments set by the Paris Agreement to the UK level. The carbon budgets presented apply to carbon dioxide emissions from the energy system only excluding Land Use, Land Use Change and Forestry (LULUCF), aviation and shipping. This report does not address the still more challenging commitment to "*pursue efforts to limit the temperature increase to 1.5°C.*" Based on our analysis, for Manchester to make its 'fair' contribution towards the 2°C commitment enshrined in the Paris Agreement, Manchester would need to:

**1) Hold cumulative carbon dioxide emissions at under 15 million tonnes (range of 8 to 24 $MtCO_2$) from 2018 onwards**. To give a sense of the scale of the challenge, at current (2015) $CO_2$ emission levels[1], **Manchester would use its entire budget within 4 to 10 years**.

**2) Initiate an immediate programme of mitigation delivering an annual average of 13% (range of 8% to 20%) cuts in emissions in order to remain within its fair 2°C carbon budget**. The 13% annual average reduction in emissions combines both national and local action and would be part of wider collaboration with Greater Manchester Combined Authority (GMCA) on meeting its emissions reductions goals. The recommended pathway, 13% per annum reductions, is similar to the annual rates of reduction achieved by Manchester in 2014 (18.8%) which was primarily driven by a change in the fuel mix for electricity (2); it is important to note that this reduction occurred over a single year only.

**3) Manchester needs to begin a rapid programme of reducing emissions from Land Use, Land Use Change and Forestry (LULUCF).** $CO_2$-only emissions from this sector should be tracked and aligned with Greater Manchester's carbon neutrality ambition and should ensure that, from 2018-2100, the net level of sequestration is equivalent to both Manchester's early LULUCF emissions and longer term non-$CO_2$ emissions.

# 2 Introduction

The UK Climate Change Act 2008 has enshrined a commitment to at least an 80 percent reduction in greenhouse gas emissions by 2050 from 1990 levels, with five yearly carbon budgets to act as stepping stones (3). The SCATTER project commissioned by GMCA developed a methodology for Local Authorities to set carbon emissions targets that are consistent with United Nations Paris Climate Agreement. The report "Quantifying the implications of the Paris Agreement for Greater Manchester" (4) from the SCATTER project recommended a carbon budget of 71 $MtCO_2$ for GM from 2018 onwards. This report complements the SCATTER report by downscaling global carbon budgets to Manchester.

[1] Based on Manchester's 2015 $CO_2$ emissions (excluding aviation, shipping, process $CO_2$ emissions from cement production and those from LULUCF).

## 2.1 Apportioning the UK budgets to Manchester City

Three apportionment regimes (Grandfathering, Population and Gross Value Added), as detailed in the SCATTER report, are used here to allocate the UK ("well below 2°C") energy-only $CO_2$ emissions budget (post-2017) to Manchester. Based on these apportionment regimes, the subsequent $CO_2$ emission budgets and illustrative mitigation rates are provided in Table 1. The recommended carbon budget for Manchester (final row in Table 1) is the mean of all the allocation regimes. The budgets are valid for 2°C provided aviation and shipping emissions are also reduced at the levels outlined by the allocations detailed in the SCATTER report (4). Any failure to hold aviation and shipping emissions within the SCATTER budgets will reduce emissions to the UK's regions, including GMCA and Manchester.

**Table 1**: Apportionment regime[2], $CO_2$ budgets and annual mitigation rates for Manchester City, 2018-2100

| **Apportionment regime (bracket term is Manchester's proportion of the UK)** | **UK mid-value budget[3] ($MtCO_2$)** | **Manchester mid value budget ($MtCO_2$)** | **Average annual mitigation rate (%)** |
|---|---|---|---|
| Grandfathered to Manchester from UK UK $CO_2$ based on population split of OECD (0.6%) **GF-Pop** | 2463 | 15 | 12.1% |
| Population split to Manchester from UK *UK $CO_2$ based on population split of OECD* (0.8%) **Pop-Pop** | 2463 | 20 | 9.5% |
| GVA split to Manchester from UK UK $CO_2$ based on population split of OECD (1.0%) **GVA-Pop** | 2463 | 24 | 7.8% |
| Grandfathered to Manchester from UK UK $CO_2$ grandfathered from OECD (0.6%) **GF-GF** | 1350 | 8 | 20.1% |
| Population split to Manchester from UK *UK $CO_2$ grandfathered from OECD* (0.8%) **Pop-GF** | 1350 | 11 | 16.0% |
| GVA split to Manchester from UK *UK $CO_2$ grandfathered from OECD* (1.0%) **GVA-GF** | 1350 | 13 | 13.4% |
| **Recommended carbon budget for Manchester** | | **15** | **13.2%** |

The family of emission pathways for Manchester premised on the carbon budgets shown in Table 1 are illustrated in Figure 1a & 1b and Table 2. The recommended carbon budgets represent 21.4% of the GM budget.

[2] The UK mid-value budgets used here are taken from the report "Quantifying the implications of the Paris Agreement: what role for the UK's energy system?" Anderson (2017).
[3] Assumes a peak in non-OECD emissions between 2022 and 2023 (6). After deducting an emissions budget for aviation, shipping and military transport of 1537 $MtCO_2$.

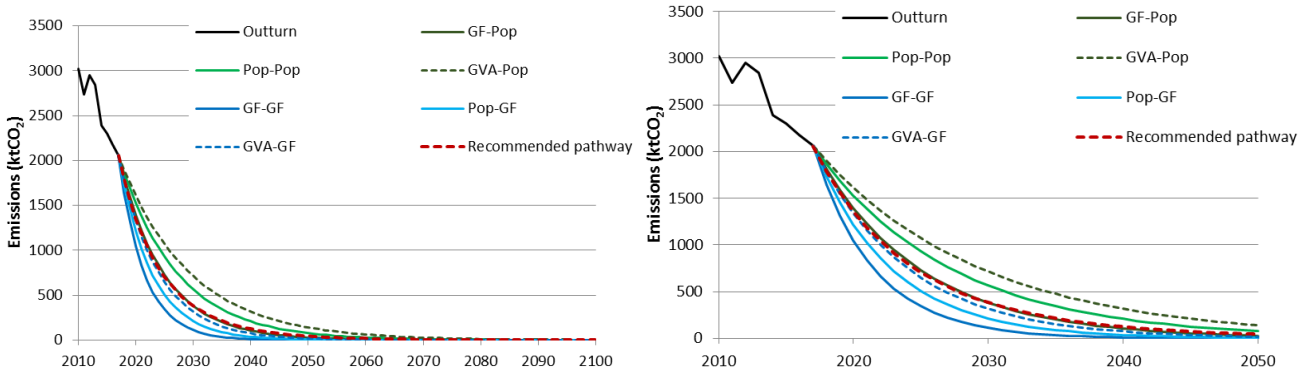



**Figure 1a (left)**: Fossil fuel $CO_2$ only emissions pathways (**2010-2100**) for Manchester City premised on carbon budgets shown in Table 1. **Figure 1b (right)**: Fossil fuel $CO_2$ only emissions pathways (**2010-2050**) for Manchester City premised on carbon budgets shown in Table 1.

**Table 2**: Periodic carbon budgets from 2018 under various regimes for Manchester City

| | | GF-Pop | Pop-Pop | GVA-Pop | GF-GF | Pop-GF | GVA-GF | Recommended Manchester $CO_2$ budget |
|---|---|---|---|---|---|---|---|---|
| Carbon budget period | 2018-2022 | 7.1 | 7.7 | 8.1 | 5.5 | 6.3 | 6.8 | 6.9 |
| | 2023-2027 | 3.8 | 4.7 | 5.4 | 1.8 | 2.6 | 3.3 | 3.6 |
| | 2028-2032 | 2.0 | 2.9 | 3.6 | 0.6 | 1.1 | 1.6 | 2.0 |
| | 2033-2037 | 1.0 | 1.7 | 2.4 | 0.2 | 0.5 | 0.8 | 1.1 |
| | 2038-2042 | 0.5 | 1.1 | 1.6 | 0.1 | 0.2 | 0.4 | 0.6 |
| | 2043-2047 | 0.3 | 0.6 | 1.1 | 0.0 | 0.1 | 0.2 | 0.4 |
| | 2048-2100 | 0.3 | 1.0 | 2.1 | 0.0 | 0.1 | 0.2 | 0.6 |

## 2.2 Allocating a carbon budget for the LULUCF sector

Land Use, Land Use Change and Forestry (LULUCF) consist of both emissions and removals of $CO_2$ from land and forests. The $CO_2$-only emissions from LULUCF in 2015 were about 0.1% (~1.5 $ktCO_2$) of Manchester's total $CO_2$ emissions (5). The Manchester city budgets and pathways for LULUCF $CO_2$-only emissions are tracked separately to, but consistent with, the Manchester energy only five-year carbon budgets (Figure 2). The detailed methodology for considering emissions from the LULUCF sector is outlined in the SCATTER report, where the cumulative emissions from 2018 to 2038 (area A) is compensated with carbon removals from 2039 to 2100 (area B). The current trend in emissions reduction (a mean of 7.7% for 2010-2015) is also shown.

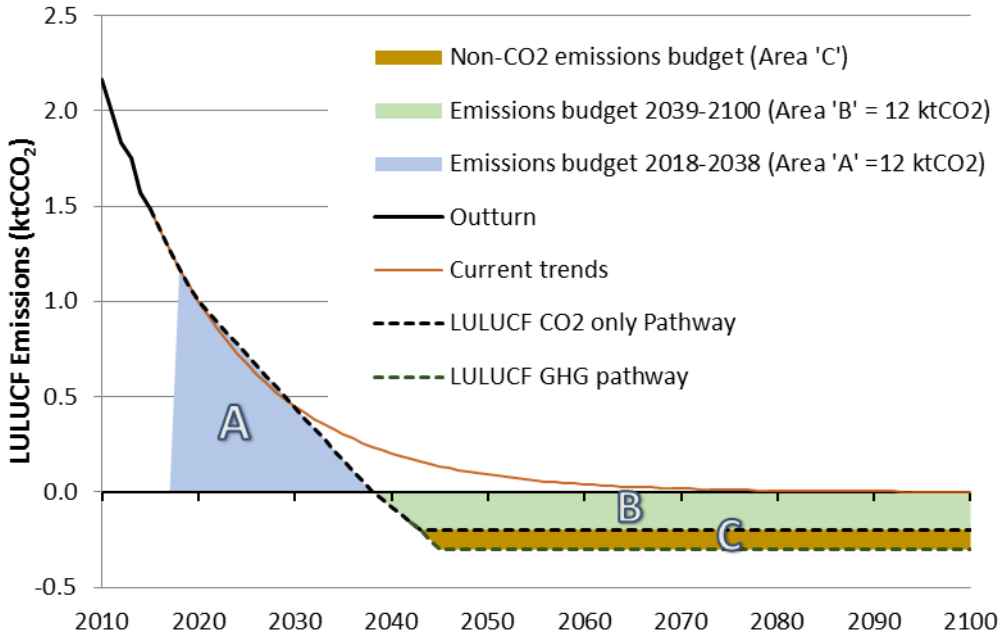



Figure 2: Cumulative emissions budget for LULUCF sector within Manchester City

## 3 Non-$CO_2$ emissions for Manchester

The Department of Business Energy and Industrial Strategy's Local Authority emissions statistics do not provide non-$CO_2$ emissions data at the regional level. Given the absence of robust non-$CO_2$ emissions data, we recommend the LULUCF pathway shown in Figure 2 should be adopted so as to include sequestration equivalent to area C in order to help compensate for any cumulative non-$CO_2$ emissions within the Manchester boundary. The pathway for non-$CO_2$ emissions is illustrative as the requisite data is not available.

## 4 Conclusion

The pathways demonstrate that if Manchester is to make its 'fair' contribution to delivering on the Paris 2°C temperature commitment then it needs to begin an immediate and rapid programme of decarbonisation to remain within the necessary carbon budget range of 8 to 24 $MtCO_2$ (for the period from 2018 onwards). To give a sense of the scale of the challenge, at current (2015) $CO_2$ emission levels[4], Manchester will use its entire budget within 4 to 10 years. However, existing trends and policies have led Manchester $CO_2$ emissions to reduce at an average rate of 8.8% per annum since 2012, similar to the lowest emissions reduction objective presented here, but still over 4% lower than our recommended mitigation rate of 13% per annum.

To provide a smooth transition in line with the above budgets, average annual mitigation rates of $CO_2$ from energy need to be between 8% and 20%, with our recommended approach requiring 13% p.a.; all of these begin from the start of 2018. Some of the annual mitigation rates for Manchester are slightly lower than those for the GM as a whole; this is because Manchester starts from lower per capita emissions (4.3 $tCO_2$, compared with the 5.5 $tCO_2$ for GM[5]). The percentage reduction of

[4] Based on GM's 2015 $CO_2$ emissions (excluding aviation, shipping, process $CO_2$ emissions from cement production and those from LULUCF).
[5] These values are for 2015 and exclude aviation, shipping, process $CO_2$ emissions from cement production and those from LULUCF. Emissions from Manchester account about 18% of the GM emissions.

emissions for the years 2020, 2030, 2040 and 2050 under each of the scenarios compared to 2015 are shown in Table 3.

**Table 3**: Percentage reduction of emissions for the $CO_2$-only scenarios out to 2050 in relation to 2015

| | GF-Pop | Pop-Pop | GVA-Pop | GF-GF | Pop-GF | GVA-GF | **Recommended pathway** | **LULUCF** |
|---|---|---|---|---|---|---|---|---|
| **2020** | 39% | 34% | 30% | 54% | 47% | 42% | **41%** | 33% |
| **2030** | 83% | 75% | 69% | 95% | 91% | 86% | **83%** | 70% |
| **2040** | 95% | 91% | 86% | 99% | 98% | 97% | **95%** | 105% |
| **2050** | 99% | 97% | 94% | 100% | 100% | 99% | **98%** | 113% |

A separate regional LULUCF $CO_2$-only emissions budget of 12 $ktCO_2$ from 2018 to 2038 is also provided aligning with the GM LULUCF sector pathway. The LULUCF emissions should reach zero by 2038 with net sequestration thereafter to compensate the cumulative LULUCF emissions from 2018 to 2038 by the end of the century.

**In summary, we recommend Manchester initiate an immediate, rapid and deep reduction in its annual carbon dioxide emissions of 13% p.a.** If instead it chooses a lower rate, then to make its fair contribution to Paris, we recommend this rate be rapidly ramped up to a minimum of 13% p.a. At the same time Manchester must maintain ongoing progress in reducing its non-$CO_2$ emissions for several decades to come.

## 5 Reference List


1. Anderson K, Bows A. Beyond “dangerous” climate change: emission scenarios for a new world. Philos Trans A Math Phys Eng Sci. 2011;369(1934):20–44.
2. Department for Business E& IS. Final UK greenhouse gas emissions national statistics: 1990-2016 [Internet]. London; 2018 [cited 2018 Feb 12]. Available from: https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2016
3. HM Government. Climate Change Act 2008 [Internet]. Vol. 27, Climate Change Act 2008 (c.27). London: The Stationery Office; 2008. p. 1–108. Available from: http://www.opsi.gov.uk/acts/acts2008/ukpga_20080027_en_1
4. Kuriakose J, Anderson K, Broderick J, McLachlan C. Quantifying the implications of the Paris Agreement for Greater Manchester [Internet]. Manchester; 2018. Available from: http://www.mace.manchester.ac.uk/media/eps/schoolofmechanicalaerospaceandcivilengineering/research/centres/tyndall/pdf/Tyndall-Quantifying-Paris-for-Manchester-Report-FINAL-PUBLISHED.pdf
5. Jones L, Joanna M, Pearson B, Tsagatakis I. Local and regional carbon dioxide emissions estimates for 2005–2015 for the UK [Internet]. Department for Business, Energy and Industrial Strategy. London; 2017. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/623020/2005_to_2015_UK_local_and_regional_CO2_emissions_technical_report.pdf
6. Anderson K, Broderick J. Natural gas and climate change [Internet]. Manchester; 2017. Available from: https://www.research.manchester.ac.uk/portal/files/60994617/Natural_Gas_and_Climate_Change_Anderson_Broderick_FOR_DISTRIBUTION.pdf

Leeds Climate Commission



**"Enabling climate action in a can-do city"**

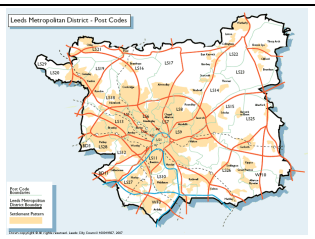
# A SCIENCE-BASED CARBON BUDGET, CARBON TARGETS AND CARBON-ROADMAP FOR LEEDS

**Context**

- A landmark 2018 report from the United Nations Intergovernmental Panel on Climate Change (IPCC) has warned of the multiple risks of climate change, and the need to restrict global warming to 1.5˚C[1] above pre-industrial levels.
- The risks of climate change include the increased frequency and intensity of extreme weather events such as storms, floods, heatwaves and droughts, rising sea levels, significant disruption to food and water systems, loss of habitats and growing numbers of species extinctions.
- These risks and impacts are forecast to increase significantly as levels of warming increase – with scientists particularly concerned about the potential for natural feedback loops, for example where thawing permafrost releases currently locked-in stores of CO2 and methane (a potent greenhouse gas) that will then lead to further climate change (so-called runaway climate change).
- The science clearly shows that these risks can be significantly reduced if levels of warming are limited. For example, limiting average global surface temperature increases to 1.5˚C rather than 2˚C would mean sea levels increasing by 10cm less by the end of the century, with key habitats and biodiversity hotspots such as coral reefs avoiding destruction. Restricting warming to 1.5˚C rather than 2˚C would also see the Arctic Ocean likely to be free of ice once per century rather than once per decade.
- The UN IPPC has warned that restricting global warming to 1.5˚C above pre-industrial levels will require "rapid and unprecedented changes in all aspects of society".
- Deep transitions or transformations in energy generation and in the ways in which energy is used in houses, public and commercial buildings, transport and industry are required, especially in cities where more than half of the world's population now lives.
- Urgent action is required. The opportunity to limit warming average global temperature increases to 1.5 °C will not last long. Given existing emissions trajectories, the UN IPCC report warns that the window to limit world temperature increases to under 1.5 °C and avoid the worst climate change impacts could close within the next 12 years.

[1] As measured by global average surface temperature increases.

**What Leeds Should Do**

| | | | |
|---|---|---|---|
|  | **GLOBAL CARBON BUDGET[2]**<br><br>**420 giga (billion) tonnes CO2e[3]** |  | **LEEDS CARBON BUDGET[4]**<br><br>**42 mega (million) tonnes CO2e** |

- To restrict increases in global average surface temperatures to no more than 1.5°C, it is estimated that the world can emit no more than approximately 420 giga (i.e. billion) tonnes of greenhouse gases (GHGs) between 2018 and 2050.
- Leeds's share of this (on a per capita basis) is estimated at approximately 42 mega (i.e. million) tonnes. This is the city's overall science-based 'carbon-budget' between 2018 and 2050.
- Leeds's annual GHG emissions in 2005 were about 6.8 million tonnes CO2e. In 2018, Leeds' emitted an estimated at 3.95 million tonnes CO2e. This means Leeds' emissions have fallen by 43% in the last 14 years.
- A significant proportion of the emissions cuts realised so far have come from the decarbonisation of the electricity that Leeds consumes. Structural changes in our economy and gradual improvements in the energy efficiency of Leeds' homes, buildings and industry and in the fuel efficiency of vehicles in the city have also contributed.
- Looking forward, we can expect further reductions in the carbon intensity of electricity supplied through the national grid. If trends in energy and fuel efficiency within the city also continue, we forecast that Leeds' emissions will fall by 59% by 2050 when compared to 2005. This means that without further action Leeds will continue to emit 41% of its 2005 level of emissions in 2050.
- A science-based carbon budget for Leeds suggests that much deeper and faster emissions cuts are needed. The science-based targets – expressed as 5-yearly carbon budgets – are set out below.

| **Science Based Carbon Reduction Targets for Leeds (relative to 2005 levels)** |
|---|
| • 2025 – 70% cut<br>• 2030 – 85% cut<br>• 2035 – 95% cut<br>• 2040 – 97% cut<br>• 2045 – 99% cut<br>• 2050 – 100% cut |

- Changes in national policy – especially in the form of continued reductions in the carbon intensity of electricity - will not be enough to deliver on these targets. Significant extra effort within Leeds will also be needed.
- The level of the challenge is especially pressing in the next decade – with the current 43% reduction on 2005 levels of emissions needing to increase to 70% by 2025 and 85% by 2030.
- Without this extra effort within the city, we forecast that Leeds will use its total carbon budget to 2050 within 9 years.

[2] The total amount of GHGs that can be emitted if global average surface temperatures are to have a good chance of being limited to 1.5 °C.
[3] A measure for all GHGs expressed as an equivalent of CO2.
[4] Leeds' per capita share of the global carbon budget that can be emitted if global average surface temperatures are to have a good chance of being limited to 1.5 °C.

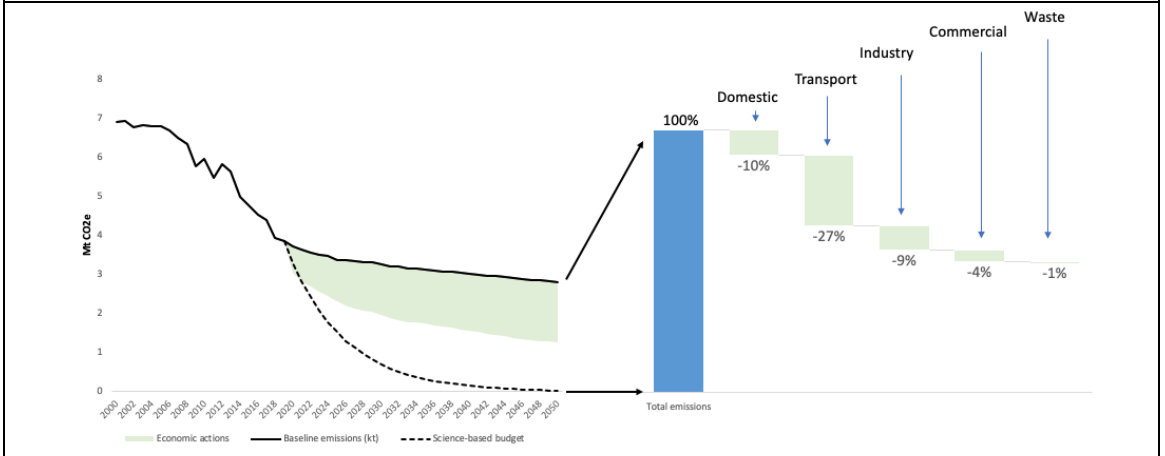
**Can We Meet these Carbon Targets and Become a 'Carbon Neutral' City?**

- The Leeds Climate Commission had already evaluated all of the existing, available options for reducing the city's GHG emissions as part of its 'mini-Stern' report.
- This report assessed the carbon saving potential of familiar options such as better insulation, more efficient heating and appliances, more efficient or electric vehicles and solar panels that could be adopted across the city.
- The analysis also shows that although these existing options can make a significant contribution to reducing emissions, they will not deliver all of the reductions in GHG emissions required in the targets set out above. For the purposes of this roadmap, we therefore identified and assessed some more innovative options, including some behavioural measures that could contribute to global carbon cuts outside of the city.
- Below we summarise the contribution that can be made by the four categories of options: economically viable options, technically viable options, selected innovative options and behavioural options that make a global contribution.
- We base our analysis on the extent to which each category of options could contribute to closing the gap between our existing emissions levels, and the level of emissions we need to reach in order to stay within our carbon budget through to 2050.

**Economically Viable Actions**

- Economically viable options are those energy and fuel efficiency measures and small-scale renewable options that would pay for themselves over their lifetime, with the savings being captured and reinvested in further low carbon measures to the point where all of the investments break even.
- In total, adopting all of the cost-effective options across the city would close the gap between current emissions and carbon neutrality by 51%.
- Adopting all of these measures in transport across the city would close the gap by 27%, adopting them in homes by 10%, in public and commercial buildings by 4%, in industry by 9% and in waste by 1%.
- Adopting these options could see Leeds reduce its total energy bill by £277m per year. Households in Leeds could save £81m per year; schools, hospitals, offices and other buildings could save £31m a year and industry in the city could cut its costs by £13.8m a year. All of this would create 4,200 years of extra employment in the city.

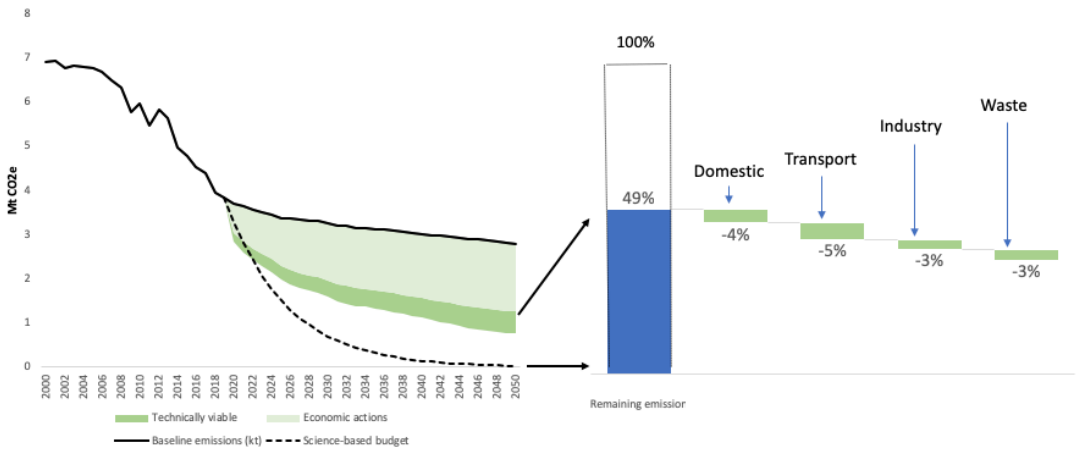
**The contribution of economically viable actions to closing the gap**



**Technically Viable Actions**

- Technically viable options are those energy and fuel efficiency options and small-scale renewable options that are technically viable but that would not cover their costs through the direct energy savings that they could generate, even though they could generate significant indirect benefits such as improved public health or better air quality.
- In total, adopting all of the technically viable options across the city would close the gap between current emissions and carbon neutrality by 15%.
- Adopting all of these measures in transport across the city would close the gap by 5%, in homes by 4% and in industry and the waste sector by 3% each.
- The carbon reductions from these technically viable options would be in addition to those that could be realised through the adoption of the economically viable options. This means that we could close the gap between current emissions levels and carbon neutrality by 66% by adopting all economically and technically viable options.

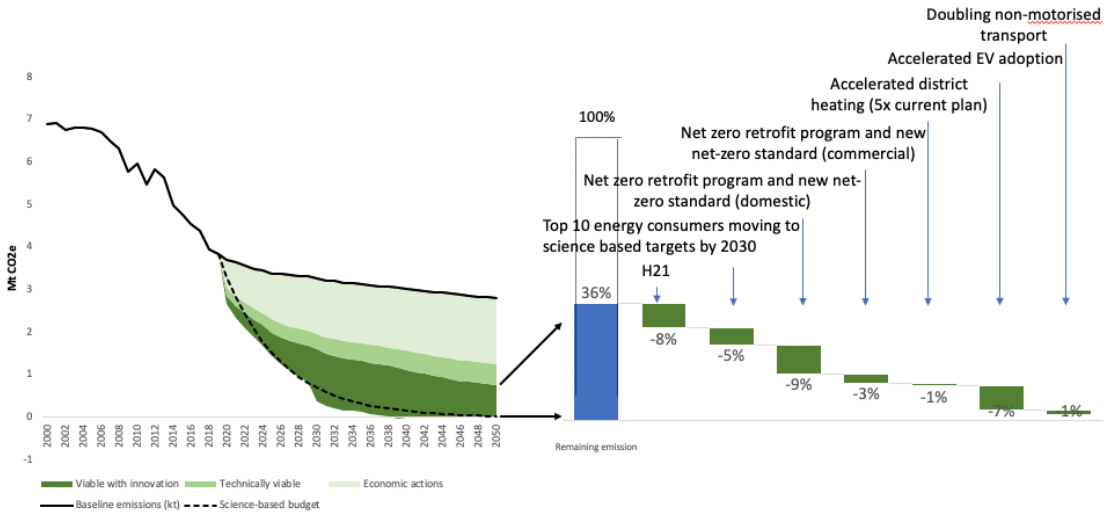
**The contribution of technically viable actions to closing the gap**



**Innovative Actions**

- There are many innovative options that could help to close the gap between current emissions levels and carbon neutrality.
- The innovative options selected for assessment here include switching the heating network to decarbonised hydrogen rather than natural gas, working with the largest energy consumers to deliver significant improvements, pursuing deep retrofit of domestic and public/commercial buildings and ensuring that all new buildings are essentially carbon neutral, accelerating role out of district heating and electric vehicles and promoting ambitious levels of active travel such as walking or cycling.
- Analysis shows that adopting all of these options through the 2020s would close the gap between the emissions levels that could be realised if all economically and technically viable options were adopted and carbon neutrality completely.
- Deep retrofit of domestic buildings and a requirement for carbon neutral new homes would close the total gap between current emissions levels and carbon neutrality by 9%, switching to hydrogen heating by 8%, accelerated adoption of electric vehicles by 7% and working with the top ten energy consumers so that they also adopt science-based targets by 5%.
- Adopting these innovative options could require policy support from national government as well as new capacities, significant investment and wide-spread buy-in across the city.

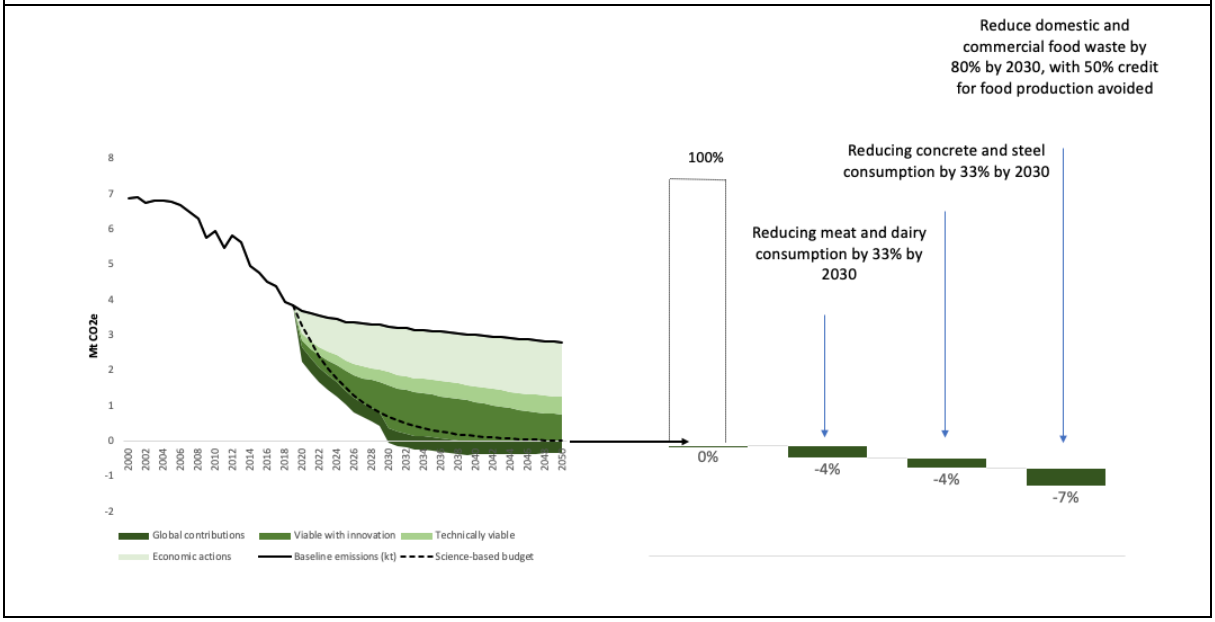
**The contribution of selected innovative actions to closing the gap**



**Behavioural Actions that Make a Global Contribution**

- Leeds' carbon footprint is normally assessed based on the fuel and electricity that is consumed with the city. These emissions are sometimes referred to as 'territorial emissions'.
- However, the city's carbon footprint also includes the emissions that occur outside of its boundaries as a result of the demand for goods and services that are consumed within the city. These emissions are sometimes referred to as embedded or 'consumption-based emissions'.
- This consumption-based carbon footprint of the city is significantly higher than its territorial emissions – and Leeds can therefore make a broader contribution to reducing global emissions by changing its consumption patterns.
- These changes could come in many forms, but here we focus on the potential contribution of reducing consumption of steel and concrete by 33% by 2030, reducing consumption of meat and dairy products by 33% by 2030, and reducing food consumption by reducing food waste by 80% by 2030.
- If the city takes 50% of the carbon credit for all of these measures, then the gap between current levels of emissions and carbon neutrality could be reduced by 7% by reducing food consumption by tackling food waste and 3% each by reducing concrete and steel consumption and meat and dairy consumption.

**The contribution of behavioural actions to closing the gap**



**What We Need to Do Next**

- If in 2005 we had proposed that we needed to cut the city's carbon emissions by 43% within 15 years that would have seemed ambitious. However, this level of reduction in emissions has been delivered, through a combination of national and local action.
- Nonetheless, the most recent IPCC report clearly shows that further and more rapid reductions in carbon emissions are now needed.
- The analysis presented in this report shows that technically and to a large extent also economically it is entirely possible for Leeds to become a carbon neutral city and to meet ambitious science-based carbon reduction targets.
- However, we should not under-estimate the broader challenges that need to be overcome if Leeds is to make the transition from where it is now to where it needs to be if it is to become a carbon neutral city.
- Delivering the further changes needed to meet ambitious targets – especially in the coming decade when fast and deep carbon cuts are required - will depend on transformative action in all parts of the city.
- It will require political, social and business support within the city, and support from central government, investors and organisations who influence life in the city.
- Leeds City Council formally signing up to the science-based budgets and the 5-yearly carbon targets set out above is a critically important first step – not least in signalling political support for the transition.
- Other organisations – especially the largest organisations and energy users in the city – should also be encouraged follow suit.
- A key challenge is to ensure that the transition is a just and inclusive one – with steps being taken to ensure that people and places are not left behind and that all social groups and economic sectors participate in and benefit from the transition.
- A crucial next step is to establish a city wide 'conversation' to raise awareness, review and refine the options and to start to build public, business and political support for transformative action.
- Moving forward, support has to be maintained, capacities have to be built, ideas need to be developed, finances need to be secured, changes need to be delivered, progress needs to be tracked and learning needs to be accelerated.
- Leeds Climate Commission can play an active role in all of these areas – but transformations are required across the whole city.

Annex C

## The University of the West of England, Bristol

# Carbon Management Plan 2013–2020

**Date: 21/03/2017**

**Version: 03 (Mid-Plan Review)**

# Pro-Vice-Chancellor's Introduction

Our updated Carbon Management Plan 2013-2020 demonstrates the commitment and ambition that UWE Bristol has for reducing our impact on the environment.

This Plan sets out the journey we must take to ensure the Carbon Management targets set in the Sustainability Plan 2013–2020 are achieved. Meeting these targets is not only important for our staff and students, but the local and global communities that we live in.

This is reflected in the UWE Bristol Strategy 2020 which explores how to provide our graduates and staff with promising futures in a sustainable learning environment. A key measure of our success in achieving this is through improving our per capita carbon footprint, as well as estate usage and efficiency.

We believe that UWE Bristol is in a unique position to make a dramatic difference to carbon reductions, not only within our own estate, but through our research in energy and water management; our partnerships wider businesses; and, through inspiring our students to become responsible global citizens.

This updated Carbon Management Plan for 2017 represents our latest performance against the targets, additional targets and post-2020 vision, as part of a mid-plan review.

I am proud to give my support for this Plan, as it demonstrates clear, robust, challenging, yet achievable targets. Even as the UWE Bristol estate continues to expand over the next few years, we are committed to reducing carbon emissions, and this Plan demonstrates how.

**William Marshall**
**Pro Vice-Chancellor (Commercial Director and Corporation Secretary)**
**March 2017**

# Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for Universities - it's all about getting your own house in order and leading by example. The UK government has identified the Public sector as key to delivering carbon reduction across the UK in line with the Climate Change Act targets, and the Carbon Management process is designed in response to this. It assists Universities in saving money on energy and putting it to better use elsewhere, whilst also helping to mitigate the economic and social risks from dangerous climate change.

The University of the West of England partnered with the Carbon Trust on this ambitious programme in 2013 in order to realise substantial carbon and cost savings. This Carbon Management Plan commits the university to an absolute target of reducing $CO_2$ by 22.5% by 2020 and underpins potential financial savings to the institution of nearly £2.78m in 2020. .

There are those that can and those that do. Universities can contribute significantly to reducing $CO_2$ emissions. The Carbon Trust is very proud to support the University of the West of England in their ongoing implementation of carbon management.

CARBON TRUST

**Tim Pryce**
**Head of Public Sector**
**July 2014.**

# Foreword from the Energy Manager

This plan has been developed with the help of many staff and academics within UWE. In particular, the professional engineers, surveyors and project managers within the UWE Estates Team provided expert advice to ensure that the projects identified to meet the targets are realistic and deliverable. This plan has also been developed with the support of many academics and students across the faculties, who provided cutting-edge thinking to our approach to the Carbon Management Plan.

I would particularly like to thank the Carbon Trust who have provided support to UWE Bristol from when we were one of the first universities to pilot the Carbon Management Plan in 2005, to today's plan. And finally, to Carbon Credentials, who provided valuable insight into the vital role of engagement and communication of the plan. The 2016 revision of the plan represents further work that has been carried out with Carbon Credentials to validate our carbon emissions and set out a detailed methodology.

We will report annually on our progress against the targets in this plan, and provide an update in our Annual Report. This plan will be continually updated and revised to ensure that UWE Bristol is on track for meeting the ambitious targets, and to ensure we remain innovative and agile in the ever-changing area of carbon management.

**Fabia Jeddere-Fisher,**
**Energy Manager**
**March 2017**

# Our core purpose is reducing our energy and cost wastage to enable us to deliver world class teaching facilities

**This Carbon Management Plan sets out how we will achieve the reductions in carbon related activities needed to meet our 2020 targets**

With rising energy costs[1], CRC costs[2], and the planned growth of the UWE campuses[3], our costs related to Scope 1&2 emissions[4] are set to rise dramatically over the life of this plan.

## Our ambition

- **Achieve carbon reduction** goals within the growing university estate – a 22.5% reduction in absolute carbon emissions[5] between 2005[6] and 2020.
- Empower our **students and staff** with the knowledge and skills to reduce environmental impact in their homes and local communities.
- Connect with **local and national businesses** to advance knowledge in delivering sustainable development.

A reduction of 29% over our 2015/16 emissions need to be made to meet our 2020/21 targets.

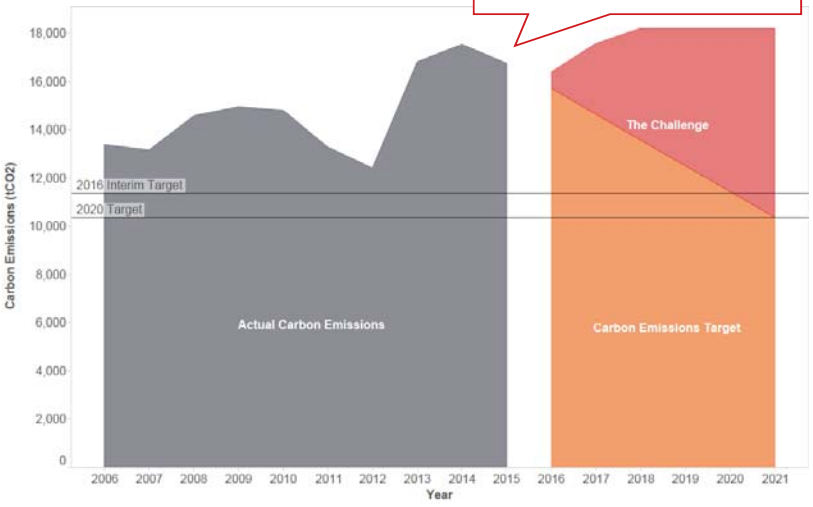



**Figure 1** shows UWE's carbon emissions progress to date (in grey), the reductions required if the 2020 target is to be met (in orange) and the scale of the challenge (in red).

[1] A conservative 4.0% increase has been assumed in this plan, however greater increases have been estimated by experts.
[2] Carbon Reduction Commitment (CRC) costs have increased from £12/$TCO_2$ to £16/$TCO_2$ from 2014/15.
[3] UWE New Campus Masterplan details here: http://www1.uwe.ac.uk/aboutus/visionandmission/uwenewcampus/uwenewcampusmasterplan.aspx
[4] Scope 1&2 are the direct emissions (natural gas burnt in UWE facilities, any refrigerants released to atmosphere, and emissions from UWE-owned vehicles) and indirect emissions related to energy-imports such as grid electricity.
[5] An 'absolute' figure has not been adjusted for the size of the university either through number of students, or floor area of buildings.
[6] HEFCE Baseline Year

# Our priorities for action:

- **Focus on 'Good Housekeeping':** Maintain good working systems throughout the estate, reducing failure costs, and increasing longevity of the infrastructure.
- **Reduce energy demand:** prioritise fabric improvements to improve thermal efficiency of the estate.
- **Supply energy efficiently:** ensure all elements of the heating, cooling, ventilation and power systems are maximised for efficiency.
- **Design for low carbon buildings:** consider the environmental impact of new buildings at the concept design stage.
- **Maximise opportunities for renewables:** Identify opportunities for installing renewables on existing and new buildings.
- **Measure, monitor and reduce all our emissions:** including in-direct emissions such as travel, waste, procurement and water (i.e. Scope 3 emissions[7]).

**"Energy management is a continuous process that develops over time. You are unlikely to tackle everything at once, so it's vital to prioritise. Dealing with the fundamentals first will provide the foundations for longer-term success"**

**Carbon Trust Guide to Energy Management, CTG054**

Scope 3 emissions are much more difficult to calculate than Scope 1&2. For this plan, we are reporting Scope 3, but not including them in the baseline, or project list.

# Our approach

UWE Bristol has a variety of types, age and location of buildings across Bristol, and we recognise that tackling carbon reductions will be different for each one. **This Carbon Management Plan sets out a 'Road Map' for carbon reductions on each of our major campuses:**

- **Frenchay,**
- **Glenside**
- **Bower Ashton**

as well as addressing:

- **UWE-Wide, organisational-level, projects.**

This plan is also aligned with our academic offering, as UWE Bristol run the energy managers education course of the Energy Institute and have a dedicated courses on climate change, energy management and carbon management. This Carbon Management Plan, and the implementation of the plan, will be used as a real-life education tool for the students.

Our Sustainability Plan 2013-2020 sets the targets as well as additional **post-2020 ambitions** for Carbon Management, as follows:

**Each Faculty and Service operates to a Carbon Budget.**

**To be on track to be "Off-grid capable" by 2040.**[8]

These are aspirational targets that demonstrate our longer term ambition, past 2020.

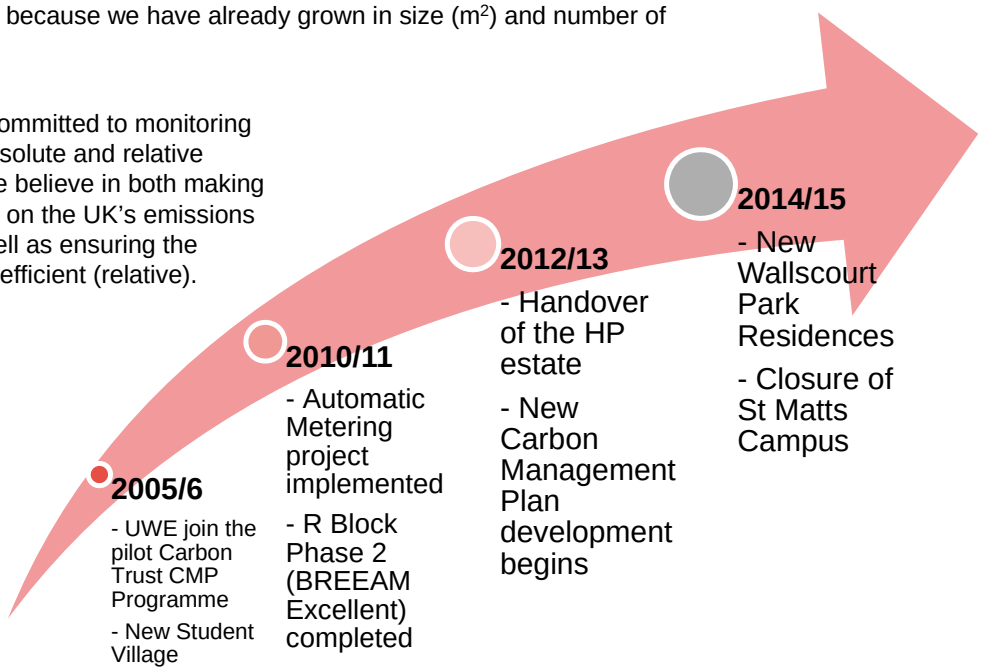
[7] Scope 3 emissions are other indirect emissions, related to travel (excl UWE owned fleet), waste, procurement and water.
[8] By 2040, for UWE campuses to be "Off-grid capable" from the electricity grid, using onsite generation, demand control technologies and battery storage

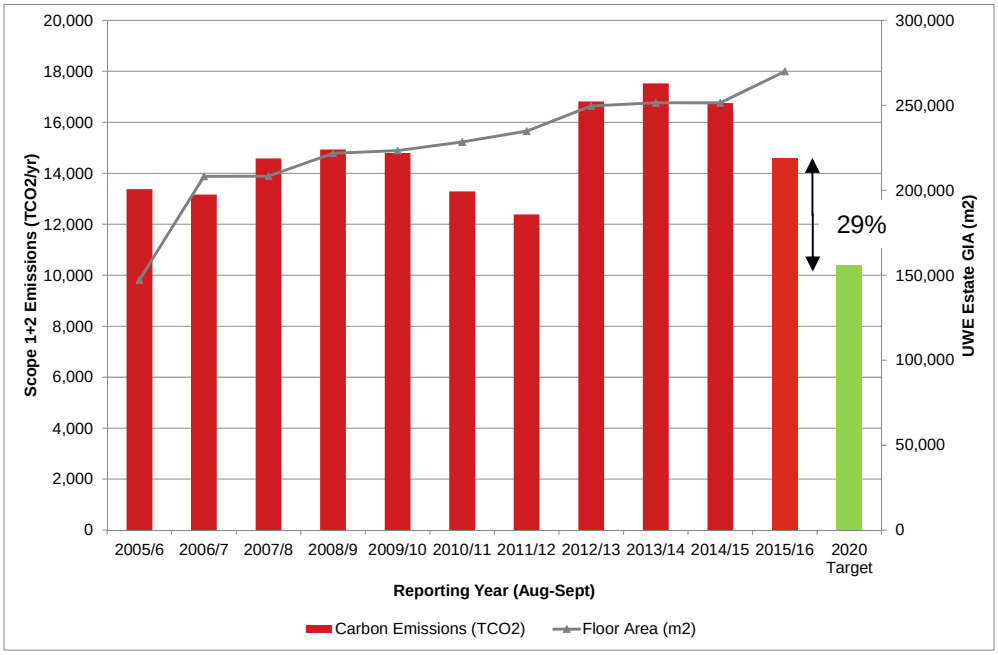
# The journey so far

In response to the UK Climate Change Act, UWE Bristol set a target with HEFCE to achieve an absolute reduction of our 2005 Scope 1&2[9] emissions by 22.5% by 2020. Considering the level of reductions already made before 2005, and plans to expand the campus, this was, and still is, a very challenging target.

For 2015/16, a 22.5% reduction over our 2005/06 emissions is equivalent to 29% of our emissions because we have already grown in size ($m^2$) and number of students.

UWE Bristol is committed to monitoring and reporting absolute and relative emissions, as we believe in both making an actual impact on the UK's emissions (absolute), as well as ensuring the estate we run is efficient (relative).




[9] Scope 1&2 are the direct emissions (natural gas burnt in UWE facilities, any refrigerants released to atmosphere, and emissions from UWE-owned vehicles) and indirect emissions related to energy-imports such as grid electricity.

# Scope 1 & 2 Baseline and Targets

UWE Bristol is dedicated to reducing its impact on the environment and has set targets which are challenging, yet realistic.

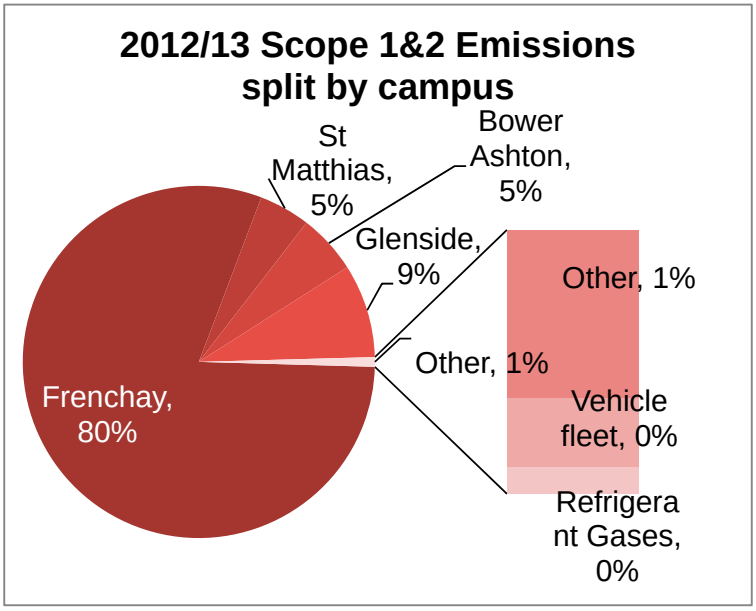
## Current Baseline

Our current baseline for this Carbon Management Plan is the 2012/13 reporting year.

**The total Scope 1 and 2 baseline for 2012/13 is 16,814TCO₂.**

We currently spend approximately £3.6m on our Scope 1 and 2 emissions and this is set to rise with increasing electricity prices.

**Our predicted energy costs in 2020 without implementing the carbon reduction projects will be £6.5m**




## 2020 Targets

The Sustainability Plan 2013-2020 renewed the targets previously set for carbon reductions, set against our baseline 2005/6. It also included targets for the campus development to ensure new buildings are low impact.

### Sustainability Plan 2013-2020 Carbon Management Targets:

**"Absolute reduction from 2005/6 – 2020/21:**

- **22.5% total reduction** by 2020/21
- 1.5% annual reduction
- 2016 interim target: 16.5% total reduction

**Relative reduction from 2005/6 - 2020/21:**

- **50% relative reduction** (based on kg $CO_2$ per $m^2$ and average weather)
- 2016 interim target: 38% relative reduction

**Low and Zero Carbon (LZC) Technology Target:**

- **10%, and 20%** of the University's electricity and heat consumption respectively, to be generated from on, or near, site low or zero carbon technologies by 2020/21. "

### Sustainability Plan 2013-2020 Campus Development Targets:

- Completed projects to exceed by 5% Building Regulations Part L2A targets for carbon emissions
- By the end of the Post Occupancy Evaluation period new buildings to perform to within 20% of energy efficiency of design prediction. CIBSE TM54/ 39 guides to be utilised to produce design stage predicted energy use model to enable comparison during post-occupancy period.

# Scope 3 Baseline and Targets

In addition to the Scope 1 and 2 reporting, UWE are making progress in reporting the Scope 3 emissions. This year (2014-15) is one of the first comprehensive breakdowns of the Scope 3 emissions with further plans to improve the methodology for future years, and take into account the more difficult to calculate aspects, such as international student commuting before/end of term.

## Scope 3 Baseline

Our baseline for the Scope 3 is the 2014/15 reporting year which represents the most complete year of data, based on data reported as part of the HESA annual returns.

**The total Scope 3 baseline for 2014/15 is 39,388$TCO_2$ (including construction) and 23,523$TCO_2$ (excluding construction).**

The Scope 3 total is comprised of the following contributions:-

- Procurement[10] = 38,381 $TCO_2$/yr with construction (excluding construction 22,945 $TCO_2$/yr)
- Water = 111 $TCO_2$/yr
- Sewage (wastewater) = 218 $TCO_2$/yr
- Waste = 69 $TCO_2$/yr
- Student Commuting = (26.1 (bus) +37.9 (car) + 0.1 (motorbike)) = 64 $TCO_2$/yr
- Staff Commuting = (1.2 (rail) +5.7 (bus) + 107.8 (car) + 1.3 (motorbike)) = 116 $TCO_2$/yr

**This gives a total Scope 1, 2 & 3 emissions in 2014/15 of 56,141 $TCO_2$/yr (including construction).**

## Per Student Total Scope Baseline

For the 2014/15 FTE student and staff population this is 2.02 $TCO_2$/yr per capita

## Scope 3 2020 Targets

The Sustainability Plan 2013-2020 set the following targets for Scope 3. This updated Plan sets the baseline, and updated targets from the mid-plan review.

**Sustainability Plan 2013-2020 Carbon Management Targets:**

**Scope 3 Target 2014/15 - 2020/21:**

- By 2018/19 to have developed a specific Scope 3 reduction strategy identifying projects to reduce scope 3.
- 10% absolute reduction (including construction) over 2014/15 baseline by 2020/21
- 5% relative reduction (excluding construction) over 2014/15 baseline by 2020/21 (based on kg CO2 per FTE student)

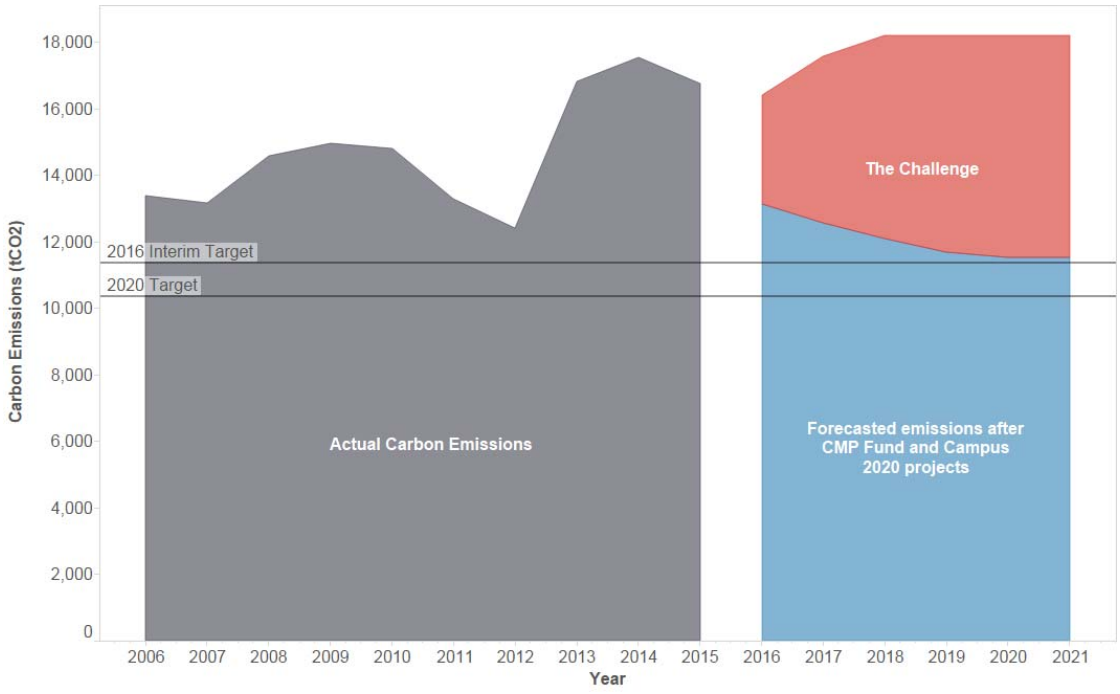
[10] Procurement emissions are calculated using the Southern Universities Purchasing Consortium (SUPC) methodology and include: Supplies and services (Audio Visual, Library, Catering, Medical, Janitorial), Furnishings, Business Travel etc.

# Road to 2020

UWE Bristol believes that the pathway to successful implementation of a Carbon Management Plan is in clear target setting; creating a culture of behaviour change; strong governance; and genuine financial and resource commitment.

## Setting the Target

The chart below shows our carbon emissions as the UWE Bristol campus grows (red area: "The Challenge"), against our targets. This includes completion of new buildings as part of the Masterplan. The blue area ("Forecast emissions after CMP Projects") presents forecasted emissions to 2020, demonstrating that 85% of the required reductions to meet 2020 targets have been identified despite significant increases in portfolio size. The remaining reductions will come from identifying further projects and technologies over the next four years, and grid decarbonisation.

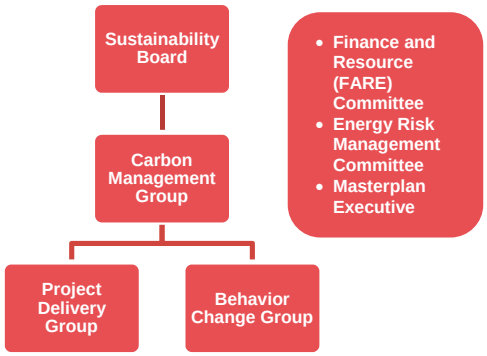



## Governance and project delivery

The Chair of the Sustainability Board, holds overall responsibility for the plan, with the lead Energy Manager holding responsibility for the implementation.

To support delivery, three new groups will be set up:

- **Carbon Management Group** with the key managers responsible for each area of carbon emissions: Buildings, Travel, Waste and Procurement.
- **Project Delivery Group(s)** with the engineers and projects managers; responsible for project implementation.
- **Behaviour Change group** with our Sustainability team; responsible for broader student, staff and visitor engagement.




We will report annually on our progress against the targets in this plan, and provide an update in our UWE Bristol Annual Report. The Annex 1 Chapter 6 provides more detail on the governance structure.

# Funding the plan

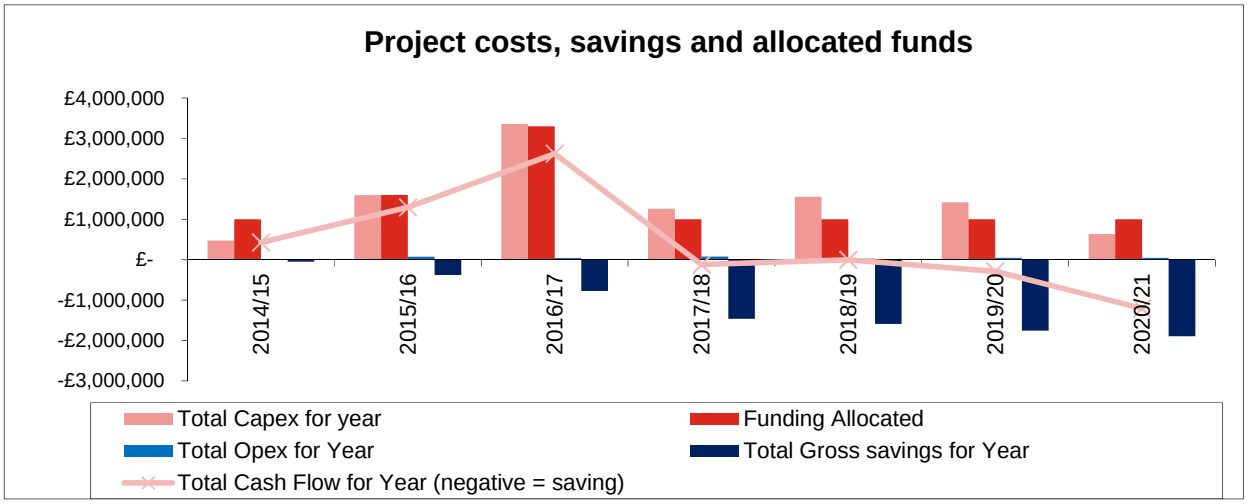
The 'Value at Stake' of not implementing these projects is £11.5m across the lifetime of the plan. However to avoid these costs, there will be significant financial and resource required from UWE Bristol to deliver this plan. This section shows the level of commitment required and how projects will be financially evaluated.

**Key Points:**

- To implement the projects defined in this plan it will **cost £10.2m** across the seven years of the plan.
- UWE Bristol have allocated **£1m funding for each year** of the plan including funding from Campus 2020 Board for specific masterplanning projects such as the District Heating for Frenchay.
- When all these projects are implemented it will result in **estimated annual financial savings of £2.8m/yr** in 2020 which will continue past the life of this plan.
- The overall payback period of all the projects in this plan is **6 years.**

## Financing the plan

The plan is expected to pay back its costs in full by 2020, and make ongoing savings to the university thereafter. Annex 1 includes the detail of the project funding required. Here is a summary of the year on year project costs, savings and allocated funds.




## Sources of funding

The funding for these projects will be from two principle sources:

- **UWE Carbon Management Project (CMP) Fund: circa £1m per year.**
- **UWE Masterplanning projects: Project specific funding.**

## Evaluation Criteria for project funding

Each project needs to meet the certain criteria, such as simple payback, cost of carbon and net present cost. The criteria is set out in Annex 1 and agreed with the finance executive.

## Measurement and Verification

Each project will be expected to provide a Measurement and Verification (M&V) Plan[11] along with the business case, and carry out post-project review to validate savings at 6-, 12- and 24-months post project completion.

[11] Guidance on preparing an M&V plan can be found at the Efficiency Valuation Organization (EVO) website, which publishes the International Performance Measurement and Verification Protocol (IPMVP)

# Carbon Road Map: Frenchay

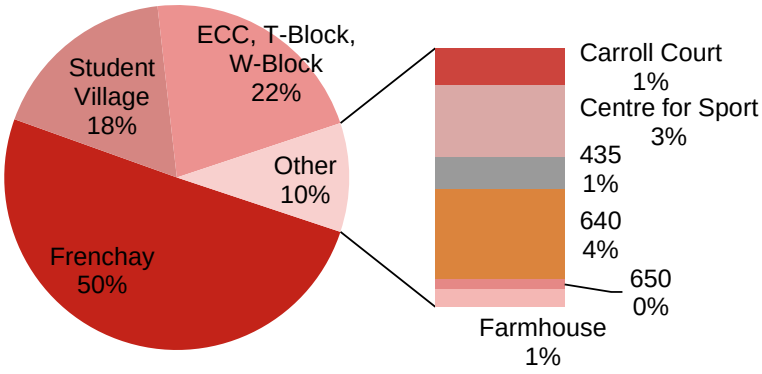
The Frenchay campus was originally built in the 1970's and has expanded year on year with further major buildings to be completed in the next few years. Frenchay campus, and associated buildings, are responsible for 80% of our Scope 1&2 emissions.

## Campus Summary

Frenchay campus accounts for a huge proportion of UWE Bristol's Scope 1 and 2 emissions and this is predominantly from three major facilities on the campus:

- Academic space of circa 90,000m$^2$;
- Student Village for approx 2,000 students; and,
- The former-HP buildings (now Bristol Robotics Laboratory and the Exhibition and Conference Centre).

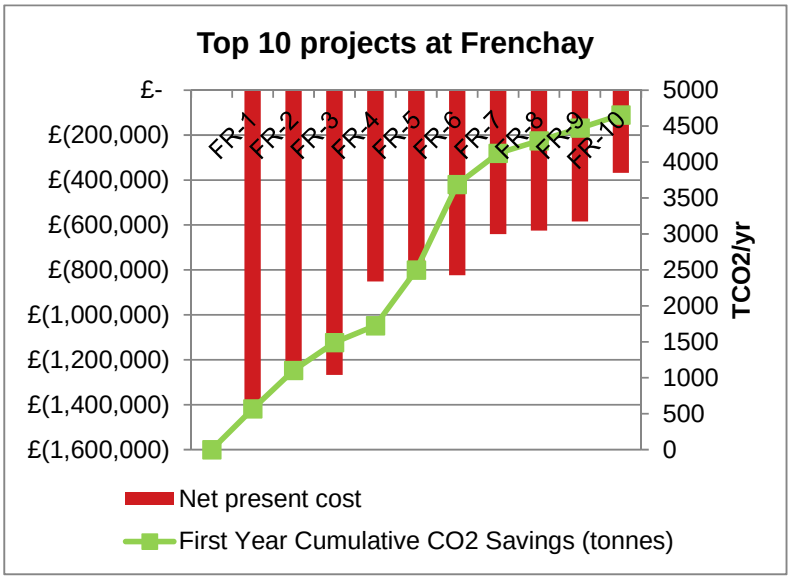
**Frenchay Scope 1 & 2 emissions split by building**




## Key Carbon Reduction Projects

- Significant savings in the former-HP buildings related to BMS controls, lighting upgrades, roof insulation, solar photovoltaics and heating controls. (Ref FR-1,2,3,4 and 8)
- District Heating Opportunities at the masterplan site and within the E and G blocks. (Ref FR-5 and 6)
- Demand reduction heating controls at Student Village (Ref FR-7)
- Solar Photovoltaics on the flat roofs of the main campus (Ref FR-9)
- Boiler Improvements (Ref FR-10)

Full list of projects are included in the Annex 1.




**The total project portfolio for the Frenchay projects are capable of delivering 65% of our 2020 absolute target.**

# Carbon Road Map: Glenside

Glenside campus is the newest addition to UWE Bristol's estate, having been opened in 1996, however it is the oldest and is Grade II listed. This makes the campus a gem of the estate to be preserved and celebrated, but comes with real challenges in terms of reducing carbon emissions.

## Campus Summary

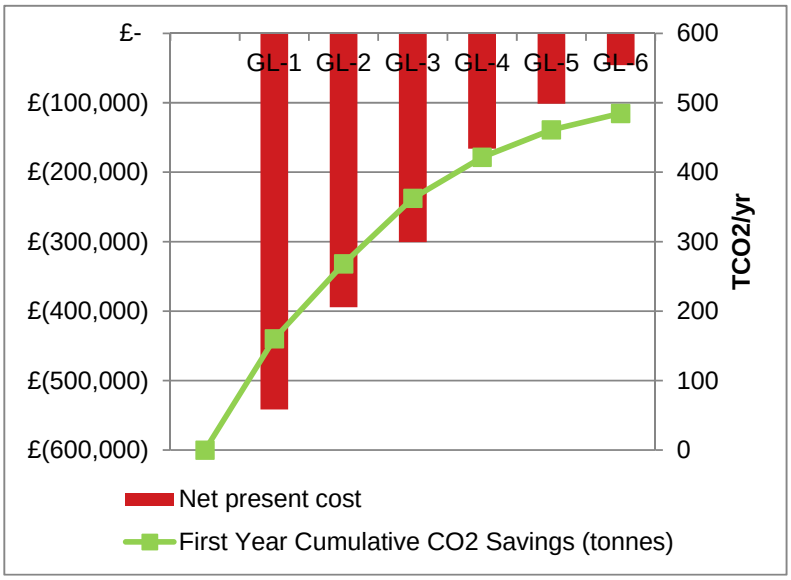
Glenside Campus is home to the Health, Nursing and Midwifery courses. It accounts for 9% of our 2012 Baseline and 11% of our estate. UWE Bristol has a number of refurbishment projects programmed for Glenside including a new lecture theatre in the old laundry area, and an area of G Block is due to be converted to a Child Nursing Simulation Suite.

## Key Carbon Reduction Projects

- Lighting upgrades to LED where suitable (Ref GL-1)
- Heating upgrades and improved controls on boilers (Ref GL-2)
- Extend the BMS and Metering systems to include Glenside, improving controllability of the heating, cooling and ventilation as well as analysis of energy use (Ref GL-3 and 4)
- Improve fabric such as draughtproofing for windows and roof insulation (Ref GL-5 and 6)

Detail of projects are included in the Annex 1.

**The total project portfolio for the Glenside projects are capable of delivering 8% of our 2020 absolute target.**



# Carbon Road Map: Bower Ashton

Bower Ashton campus is located in Bristol, close to the picturesque Ashton Court Estate. The majority of the campus is 1970 buildings, with newer buildings F-Block (2008) and the A-Block Courtyard Infill project (due for completion September 2014).

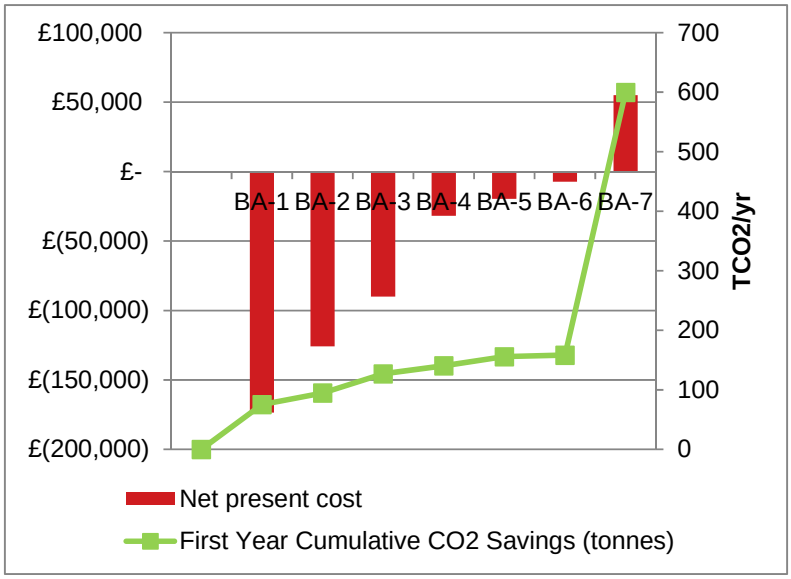

## Campus Summary

Bower Ashton is home to the Arts, Creative Industries courses, and with the move of Drama courses from St Matthias campus to Bower Ashton in Summer 2014, Bower Ashton is set to be a busy and bustling campus.

## Key Carbon Reduction Projects

- Expand the BMS systems at Bower Ashton, improving controllability of the heating, cooling and ventilation (Ref BA-1)
- Solar Photovoltaics on the flat roofs of the campus (Ref BA-2)
- Heating upgrades and improved controls on boilers (Ref BA-3)
- Lighting upgrades to LED where suitable (Ref BA-4)
- Improve fabric such as cavity wall insulation and roof insulation (Ref BA-5 and 6)
- Install Biomass Boiler to supply the campus with renewable heat (Ref BA-7)

Detail of projects are included in the Annex 1.




**The total project portfolio for the Bower Ashton projects are capable of delivering 7% of our 2020 absolute target.**

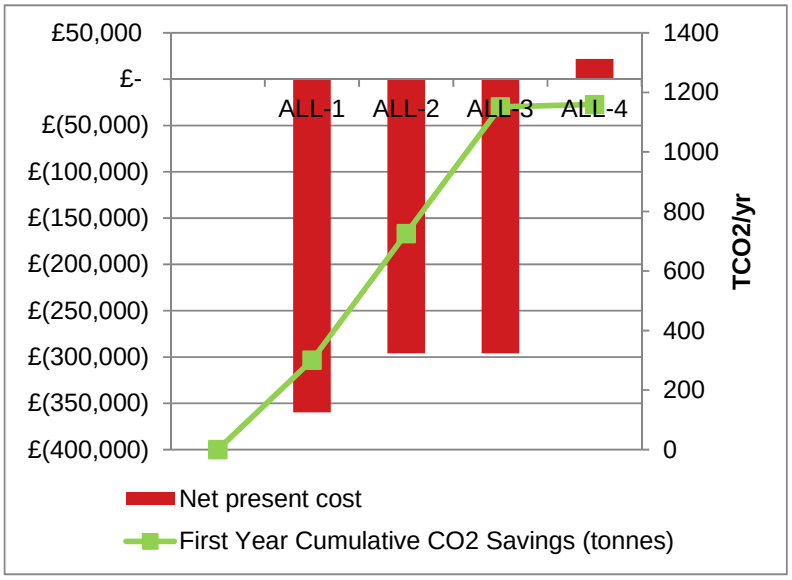
# Carbon Road Map: University wide

Across the university we have many organisational systems and procedures that contribute to our carbon emissions, from IT services, to room timetabling. This Road Map looks at the organisational projects that could make either significant reductions in carbon emissions, or be the 'enablers' for other carbon reduction projects.

## Key Carbon Reduction Projects

- Maintain 'good housekeeping' on all aspects of energy including ongoing engagement projects and revisiting projects completed to measure actual performance (Ref ALL-1)
- Increase resourcing for the energy and BMS teams to enable successful project delivery (Ref ALL-2 and 3)
- ITS software to switch-off PCs and Printers when not in use (Ref ALL-4)

**The total project portfolio for the University-wide projects are capable of delivering 14% of our 2020 absolute target.**




## Further Carbon Reduction Projects being investigated

UWE Bristol has the potential to provide further savings to space utilisation as well as carbon, with the following projects:

- Staff and Student Engagement projects and 'energy challenges'.
- Central PC Hub for out of hours access to key software packages.
- Central Academic Hub for out-of-hours bookings for events and social committees.
- Faculty-level carbon budgeting to enable faculties to measure and monitor their improvements against activities.
- For all new projects, implement the principles of Soft Landings[12] and utilise an independent commissioning agent.

[12] BSRIA Soft Landings Framework https://www.bsria.co.uk/services/design/soft-landings/

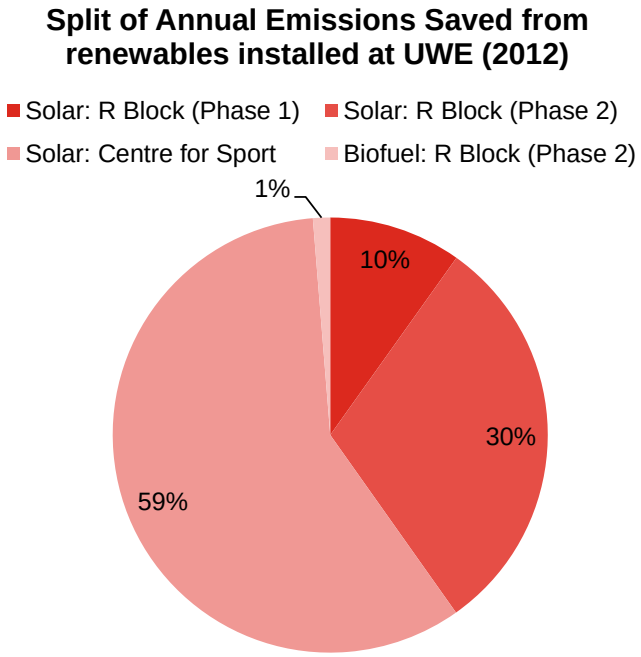
# Low and Zero Carbon Technologies Road Map

To support South Gloucestershire's renewable targets, the University has set a target of 10%, and 20% of the University's electricity and heat consumption respectively, to be generated from on, or near, site low or zero carbon technologies by 2020/21.

## Existing Systems

UWE Bristol has already invested in the renewable technologies at the Frenchay campus including the largest roof mounted array in the UK HE sector installed summer 2016. Therefore, UWE have over 500kWp of solar photovoltaics and a biofuel boiler run on recycled cooking oil from our kitchens.

**The total carbon emissions saved from renewables in 2012/13 is 27TCO$_2$**

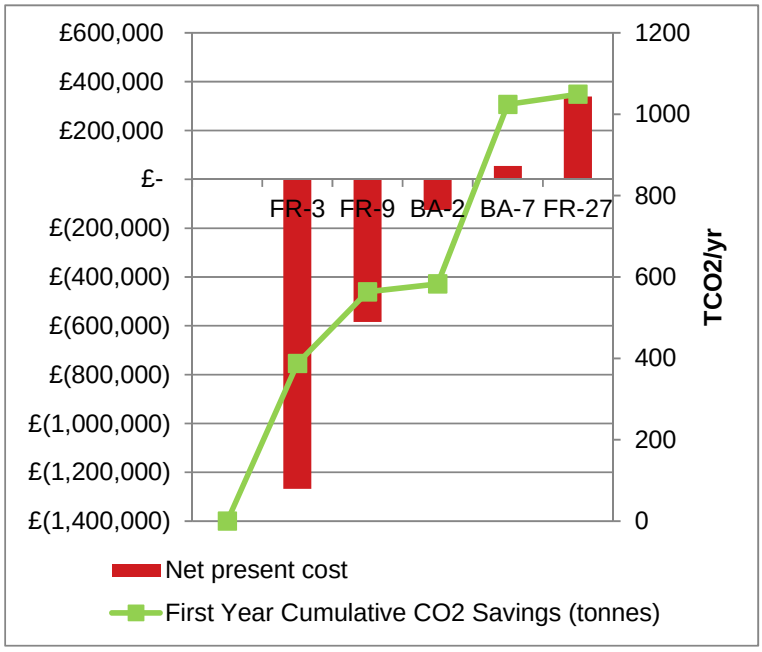



## Key Carbon Reduction Projects

Opportunities for onsite renewable technologies have been identified across the Bower and Frenchay campuses. The following projects would enable us to meet our 2020 Renewables Target:

- Solar Photovoltaics at T-Block, ECC, Frenchay main campus and Bower Ashton (Ref FR-3,-9 and BA-2)
- Biomass Boiler at Bower Ashton supplied by Local Wood Chip (Ref BA-7)
- Solar Thermal providing hot water at the Frenchay Student Village (Ref FR-27)

**The total project portfolio for renewable energy projects are capable of *exceeding* our 2020 renewables target delivering 12% and 7% of our electricity and gas consumption.**



# Electricity Grid Demand reduction

To support the UK aims to decarbonise the grid, the University recognises the need to reduce peak demands as much as possible. This can be achieved using demand management technology, battery storage, and behaviour change.

## Grid Decarbonisation

The UK National Grid peak hours of demand are between 4-7pm, particularly during heating season (Nov – Feb). Therefore, if UWE Bristol can reduce, or move, electricity consumption away from these periods, then UWE are not only supporting the national targets, but also making significant financial savings from the peak charges.

**Mid-Plan review targets:**

**Maximum Grid Electricity Demand Strategy:**

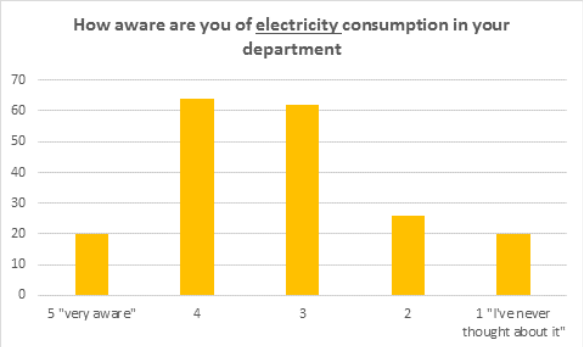
- By Spring 2018, to have developed a strategy for managing maximum grid electricity demand, based on assessment of historic usage patterns, and utilising on site generation, to minimise strains on the national grid and support its decarbonisation.

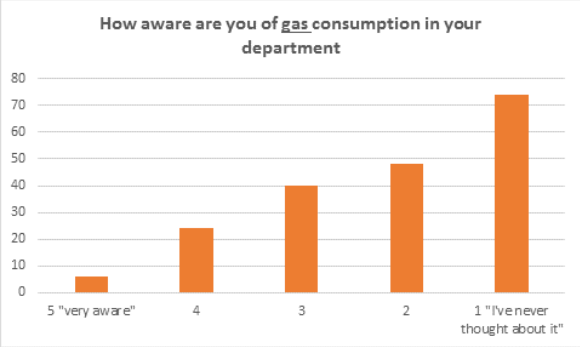
# Improved energy and carbon awareness

UWE Bristol are committed to being a responsible educator, not only for the students but staff as well. Therefore, as part of the mid-plan review, an additional target of measuring energy and carbon awareness has been included.

## 2016 survey results

The baseline of staff awareness from a survey in 2016 for the pilot areas of the Carbon Action Project (HAS, SU, UWE Exec, Accommodation and Sport) is shown below:




**Mid-Plan review targets:**

**Improved energy and carbon awareness:**

- By 2020 to have over 50% of the responses either ‘aware’ or ‘very aware’ to questions on electricity and gas awareness.

# How to get involved

- If you see energy and water wastage let us know by contacting the 222 Helpdesk or emailing **energyteam@uwe.ac.uk**
- Communicate with others on saving energy and reducing waste; join student Green Leaders and the UWE sustainability supporters network – email **sustainability@uwe.ac.uk**
- Switch off lights PCs and projectors and take part in student and staff energy saving campaigns e.g. UWE Student Switch off.
- Print only when really needed (double sided) to save energy paper and ink
- Shorten your showers in the Student Village to reduce energy and water consumption
- Come along to our winter evening Green mingles and energy watches email **sustainability@uwe.ac.uk**

# How to find out more

- Go to our Sustainability and Energy webpages **http://www1.uwe.ac.uk/aboutus/visionandmission/sustainability.aspx**
- Explore our policies and strategies webpages **http://www1.uwe.ac.uk/aboutus/visionandmission/sustainability/facilitiesandoperations/energyandwater.aspx**
- Expand your understanding of carbon management with the Carbon Trust guides webpages **www.carbontrust.com**
- See what UWE Bristol are doing for the Bristol Green Capital 2014 webpages **bristolgreencapital.org**
- Follow us on Twitter **@UWEEnergyTeam**

## Contact Details

**Energy Team:**

**Fabia Jeddere-Fisher, Energy Manager** Fabia.Jeddere-Fisher@uwe.ac.uk
**Melissa Clarke, Energy Projects Officer** Melissa2.Clarke@uwe.ac.uk
**Kirsti Norris, Carbon Budgets Manager** Kirsti.Norris@uwe.ac.uk
**Elaine Williams, Energy Administrator** Elaine.Williams@uwe.ac.uk

**Carbon Reduction Project Leads:**

**UWE-Wide: Nicholas Loughlin, Head of Estates**
**Frenchay: Robert Hill / Steve Denning**
**Glenside: Vaughan Castell**
**Bower Ashton: Sarah Cole**

Annex D

Copenhagen
Carbon Neutral
by 2025

# CPH 2025 CLIMATE PLAN

## A GREEN, SMART AND CARBON NEUTRAL CITY

# CPH 2025

**“WITH THE CLIMATE PLAN, WE ARE INVESTING IN GROWTH AND QUALITY OF LIFE; COPENHAGENERS WILL HAVE A BETTER DAILY LIFE. THE INVESTMENTS ARE ENSURING JOBS NOW - AND THE NEW SOLUTIONS ARE PROVIDING THE FOUNDATION FOR A STRONG GREEN SECTOR.“**

Lord Mayor of Copenhagen, Frank Jensen

**”A CARBON NEUTRAL CAPITAL WILL ONLY BECOME A REALITY WITH SUPPORT AND COMMITMENT FROM COPENHAGENERS. WE MUST CHANGE OUR DAILY LIVES AND OUR HABITS. THE REWARD WILL APPEAR IN THE FORM OF A NUMBER OF ENVIRONMENTAL BENEFITS SUCH AS CLEAN AIR, LESS NOISE AND GREATER QUALITY OF LIFE.”**

Mayor of the Technical and Environment Administration, Ayfer Baykal

# COPENHAGEN – CARBON NEUTRAL BY 2025

## CPH 2025 CLIMATE PLAN: A HOLISTIC PLAN

THE CPH 2025 CLIMATE PLAN IS A HOLISTIC PLAN AS WELL AS A COLLECTION OF SPECIFIC GOALS AND INITIATIVES WITHIN FOUR AREAS - ENERGY CONSUMPTION, ENERGY PRODUCTION, GREEN MOBILITY AND THE CITY ADMINISTRATION. WORK IN THE FOUR AREAS MUST BE SET IN MOTION IMMEDIATELY FOR COPENHAGEN TO BECOME THE WORLD'S FIRST CARBON NEUTRAL CITY.

THE CPH 2025 CLIMATE PLAN DESCRIBES HOW OUR AMBITIONS FOR CARBON NEUTRALITY SHOULD BE USED AS LEVERAGE FOR A BETTER QUALITY OF LIFE, INNOVATION, JOB CREATION AND INVESTMENT IN GREEN TECHNOLOGIES, AND HOW THE GOAL OF CARBON NEUTRALITY CAN BE ACHIEVED BY 2025 THROUGH CLOSE COOPERATION BETWEEN PUBLIC AUTHORITIES, BUSINESSES, KNOWLEDGE INSTITUTIONS AND COPENHAGENERS.

## COPENHAGEN – CARBON NEUTRAL BY 2025

As a metropolis and capital, Copenhagen can and must take its share of the responsibility for climate change. At the same time, we must show that it is possible to combine growth, development and increased quality of life with the reduction of $CO_2$ emissions, so that by 2025 we will be able to call ourselves the world's first carbon neutral capital. It is about finding solutions that are smarter, greener, healthier and more profitable: solutions that do not make it more expensive to be a Copenhagener, yet promote green growth and enhance the quality of life for the individual citizen.

Work done to become the world's first carbon neutral city is not only a gain for the climate and environment. The initiatives will have positive effects on Copenhageners' lives generally as well as on an everyday basis. Copenhagen is now internationally recognized and designated as one of the world's best cities to live in. It's safe, inspiring and diverse, with a mixture of old and new buildings, green spaces where you can fill your lungs with fresh air and people who actively use its urban spaces.  And it must continue to be so in 2025, when we can expect up to 110,000 more Copenhageners.

A population growth of 20 % requires major infrastructural change in Copenhagen. At the same time, these changes will give the city the opportunity both to become carbon neutral and create green growth. Since 1990, carbon emissions have been reduced by more than 40 %, while over the same period there has been a real growth of around 50 %. Copenhagen and the Capital Region are now the front runners in the green Danish economy. This position will accelerate and expand in the years ahead and our ambition is to make Copenhagen an international centre for cleantech companies. With a carbon neutral Copenhagen, Danish companies will have a unified platform to demonstrate and showcase green, Danish technologies.  This will not be the case just for embryonic projects and demonstration facilities on a smaller scale, but in a full-scale metropolis, where technologies are in a symbiosis with solutions, showing their strength both separately and together at the same time.

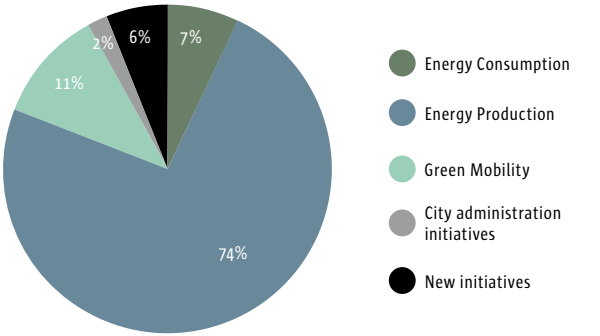
Copenhagen is ready to make the city available as a green laboratory and, with the CPH 2025 Climate Plan, is prepared to meet the climate challenge and take the step towards a carbon neutral Copenhagen by 2025.

## CARBON EMISSIONS MUST BE REDUCED BY 1.2 MILLION TONS

Climate action has been in full swing in Copenhagen since 2009, when the Copenhagen Climate Plan up to 2015 was adopted. The initiatives which were launched have contributed to substantial $CO_2$ reductions. The goal of a 20 % reduction by 2015 was already achieved by 2011, when $CO_2$ emissions were reduced by 21 % compared to 2005.

Today, Copenhagen emits 1.9 million tons of $CO_2$. By 2025, this will have fallen to 1.2 million tons due solely to a number of planned activities, such as switching from coal to biomass in combined heat and power plants in the Capital Region and because of the conditions in the existing legislation on energy and transport.

In order to become carbon neutral by 2025, the city must use less energy than it does today and at the same time divert energy production to green energy. In addition, a surplus of green energy must be produced to offset the emissions that will continue to be generated from for example transport.




//Distribution of the $CO_2$ reduction in 2025 caused by the initiatives in the climate plan.

# ENERGY CONSUMPTION

MAJOR GOALS FOR 2025

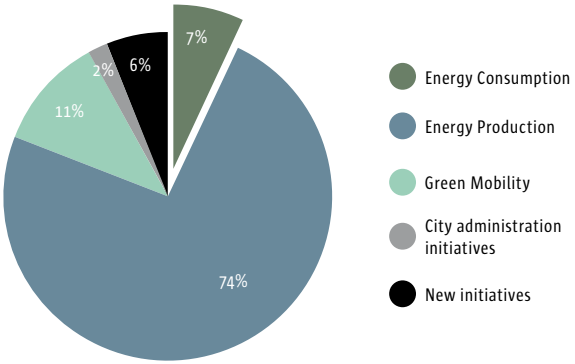
// 20 % REDUCTION IN HEAT CONSUMPTION, COMPARED TO 2010.
// 20 % REDUCTION OF ELECTRICITY CONSUMPTION IN COMMERCIAL AND SERVICE COMPANIES, COMPARED TO 2010.
// 10 % REDUCTION OF ELECTRICITY CONSUMPTION IN HOUSEHOLDS, COMPARED TO 2010.
// INSTALLATION OF SOLAR CELLS CORRESPONDING TO 1 % OF ELECTRICITY CONSUMPTION IN 2025.

# THERE IS GREAT POTENTIAL TO MAKE EXISTING BUILDINGS MORE ENERGY EFFICIENT IN COPENHAGEN, SINCE 70% OF BUILDINGS WERE BUILT BEFORE THE FIRST BUILDING REGULATIONS WERE PASSED.

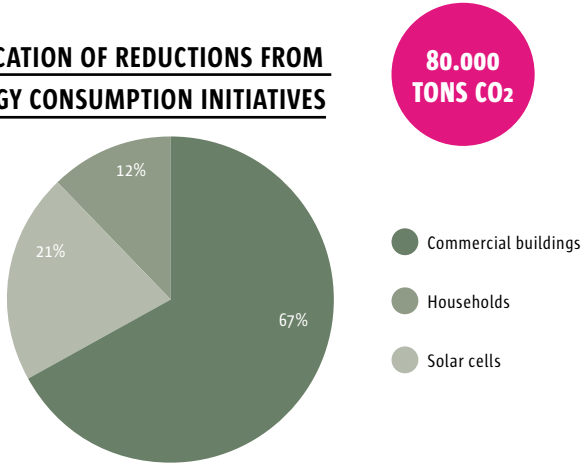
In 2010, heat and electricity consumption in Copenhagen caused the equivalent of 75 % of the total $CO_2$ emissions in Copenhagen. In the expectation that Copenhagen will grow by nearly 110,000 residents by 2025 and provide space for 20,000 new jobs, there is a pressing need to ensure that the city and those people using its facilities act as efficiently as possible with the resources.

To ensure that resources are used as efficiently as possible, the CPH 2025 Climate Plan will pave the way for significant energy reductions in both residential and commercial construction. The initiative will be comprehensive and cover all sectors in Copenhagen.

## SHARE OF TOTAL CARBON REDUCTION




## ALLOCATION OF REDUCTIONS FROM ENERGY CONSUMPTION INITIATIVES



COPENHAGEN MUST BE DEVELOPED INTO A SMART CITY WITH IMPROVED OPPORTUNITIES FOR FLEXIBLE ENERGY CONSUMPTION

## MAIN INITIATIVES

- Improvement of building structures and conditions, including the development and testing of a new financial model for the implementation of energy savings as well as continuing to work to change legislation towards an increased level of energy efficiency
- Energy efficient buildings in Copenhagen. Procedures and guidelines must be established, as well as funds targeted for increased climate retrofitting. Regulation of heat and domestic water supplies must be secured. A model for energy savings in commercial and service companies must be developed, tested and implemented.
- Motivate and support the dissemination of solar cells.
- Establish an organization of interested stakeholders to ensure that accumulated knowledge and experience in energy efficient building is collected at an appropriate point in time and disseminated to interested parties.
- The City of Copenhagen wants to create lighthouse projects both in new low energy constructions and energy retrofitting. A green growth partnership needs to be set up to contribute to the construction of private lighthouse buildings.
- Copenhagen must be developed into a SMART city. A digital infrastructure must be laid down for public data for electricity and heat consumption, the opportunities for flexible energy consumption must be improved, the concept of the smart building must be disseminated and the framework for the use of on shore electricity for cruise ships must be improved.

## ECONOMY

When coal is phased out in favour of biomass in the future of district heating in Copenhagen, heating will become more expensive, seen from an economic point of view. So, major economic benefits can be gained by reducing energy consumption in buildings. This also means that investment in new energy production can be minimised.

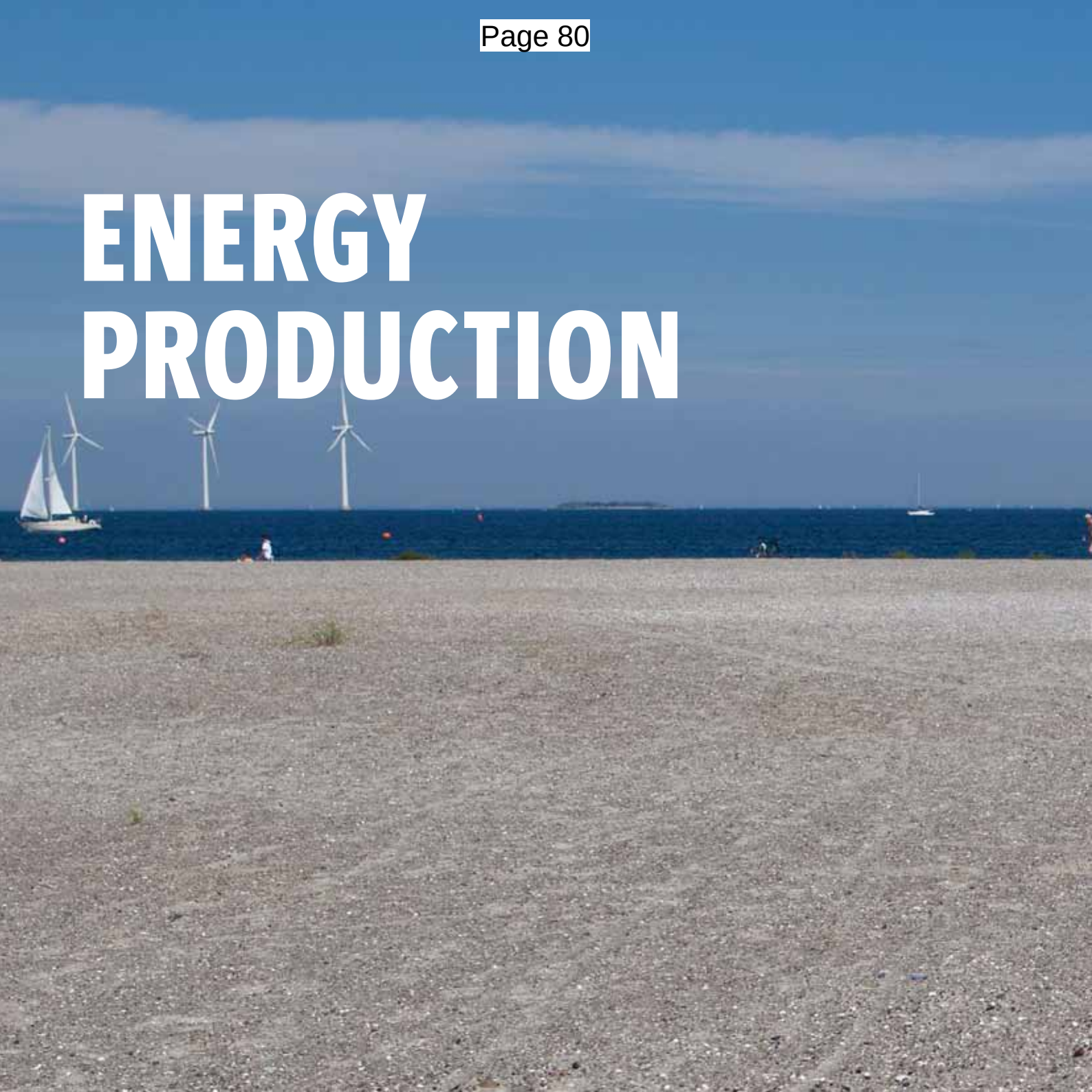
The City of Copenhagen's total cost for implementing the initiatives that will form the basis of the reduction of energy consumption in buildings in Copenhagen is expected to be at least DKK 170 million up to the year 2025. This implies amongst other things, concept and model development as well as funds for demonstration projects.

There will be a total economic saving of about DKK 1.6 bn by reducing heat consumption by 20 % and electricity consumption by 20 % respectively in companies and 10 % in households. An average household will save about DKK 350 per month when these goals are achieved.

The total investment in new construction and retrofitting of existing buildings will require investments of up to DKK 180 bn up to 2025. From now up to 2025, it is expected that 6.8 million sq meters of new buildings will be constructed in Copenhagen, which will mean an investment of around DKK 130 bn. When new building are constructed today to meet the highest specifications in building regulations, costs may increase by up to 5 %, corresponding to a total additional cost of up to 6 bn. The cost of low energy buildings is expected to adapt rapidly to the current level.

At the current rate of retrofitting , the equivalent of 11.3 million sq meters will be retrofitted up to 2025. This will mean an investment of around DKK 40 bn. If the rate of retrofitting is increased by half a percentage point, which is the Climate Plan's goal, a total of 13.7 million sq meters will be retrofitted This will entail additional investments of around DKK 8 bn. Of these, investment in extra energy retrofitting represent DKK 3.6 bn.

The total investment in solar cells in the private sector is estimated to be at least DKK 425 million up to 2025.



# ENERGY PRODUCTION

MAJOR GOALS FOR 2025

// DISTRICT HEATING IN COPENHAGEN IS CARBON NEUTRAL.
// ELECTRICITY PRODUCTION IS BASED ON WIND AND BIOMASS AND EXCEEDS TOTAL ELECTRICITY CONSUMPTION IN COPENHAGEN.
// PLASTIC WASTE FROM HOUSEHOLDS AND BUSINESSES IS SEPARATED.
// BIOGASIFICATION OF ORGANIC WASTE.

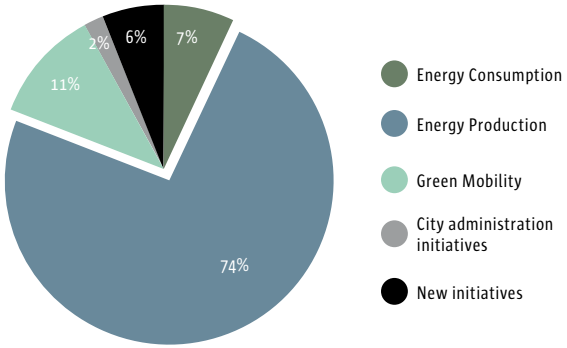
# COPENHAGEN MUST ENSURE THAT ELECTRICITY PRODUCTION BASED ON WIND, BIOMASS, GEOTHERMAL ENERGY AND WASTE, EXCEEDS IN TOTAL THE CITY'S ELECTRICITY CONSUMPTION.

By 2025, Copenhagen's production of electricity and heating will be mainly based on wind, biomass, geothermal energy and waste. The goal is to make district heating for Copenhageners carbon neutral by 2025. Additionally, Copenhagen will establish electricity generation based on renewable energy which in total exceeds the city's electricity consumption.

Energy production combining several different renewable energy sources ensures flexibility in the energy system, making it possible to meet the varying energy needs Copenhageners and the city's businesses have throughout a twenty-four hour period. In this way, energy resources are best utilised and the reliance on the individual sources of energy is reduced .

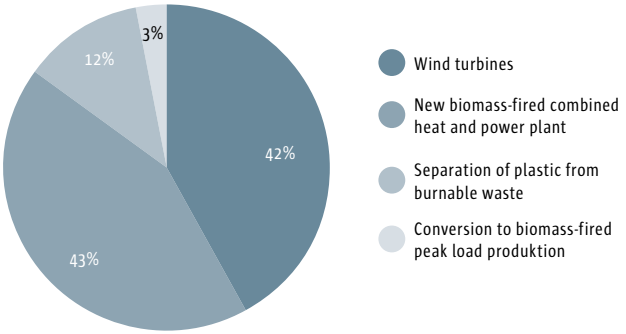
As well as benefitting the climate and the environment globally and locally, the switch over of energy production offers opportunities for green jobs. Partly in relation to the conversion to already developed energy technologies, partly in relation to the development and demonstration of future green energy solutions in the world's major cities.

## SHARE OF TOTAL CARBON REDUCTION




## ALLOCATION OF REDUCTIONS FROM ENERGY PRODUCTION INITIATIVES

**855.000 TONS $CO_2$**



## MAIN INITIATIVES

### 100 WIND TURBINES BEFORE 2025

More than 100 wind turbines are scheduled to be installed by 2025, with a total capacity of 360 MW. The work includes the installation of wind turbines both inside and outside the municipal boundary as well as onshore and offshore:

- Seven wind turbines will be built on Prøvestenen and Kalvebod Syd in 2012/13. The City of Copenhagen attaches great importance to anchoring activities and initiatives in the local community as well as involving the citizens. For this reason, Copenhageners will be given the opportunity to buy shares in wind turbines - initially in wind turbines in Copenhagen. An investigation will also be carried out as to how businesses in Copenhagen can have an opportunity to contribute actively to the development of renewable energy.
- Copenhagen Energy will find suitable locations in other municipalities and negotiate with the owners of the sites.
- Coastal offshore wind turbines near the coast will also be built in the Sound (Øresund). This includes a series of development projects as well as an agreed accounting model at national level.
- Copenhagen Energy has been mandated to participate in joint ventures which can make tenders for wind turbines at sea at national level for example, Kriegers Flak.

### HEAT GENERATION AND BIOMASS

The City of Copenhagen wants an energy system to be set up with multiple sources of energy that can supplement each other, so the city will have a flexible electricity and heat supply. This means that biomass-fired combined heat and power plants will need to adjust their energy production even more when the wind is not blowing and the turbines are generating less energy.

- By 2025, Copenhagen must have a carbon neutral heating supply, based primarily on biomass, waste and geothermal energy. The power stations at Amager and Avedøre will be converted to biomass, and a new biomass-fired combined heat and power plant capacity will be established in Copenhagen.
- Production of peak loads will be based on carbon neutral fuels.
- Within the coming years, a final decision must be taken about the role of geothermal energy in the energy production in Copenhagen; this includes any possible role Copenhagen Energy may play in a possible production.

### WASTE AS A RESSOURCE

There is a strong correlation between initiatives in waste incineration and district heating supply in the Copenhagen area. This applies both in relation to incineration capacity and to the new methods of treatment in waste management, as well as in relation to sorting and recycling.

- A new, high-tech waste treatment centre must be set up which would eventually include the sorting of waste, preparation for recycling, biogasification and incineration.
- Prevention, separation and recycling of plastics will be done by establishing three new collection streams to ensure that the hard plastic, metal and small electronics are sorted for recycling
- The possibilities for collecting and processing organic waste for biogasification should be charted. This would include estimating the economy and functionality in the REnescience plant.

## ECONOMY

Construction costs for 360 MW of wind turbines are estimated to be DKK 5.5 bn. The City of Copenhagen will stand guarantor for Copenhagen Energy borrowing money for wind turbine projects, at the same speed as each project develops.

Investment in electricity and heat generation will be partly funded by energy companies and partly funded by district heating charges. However, the City of Copenhagen may decide to make loan guarantees for:

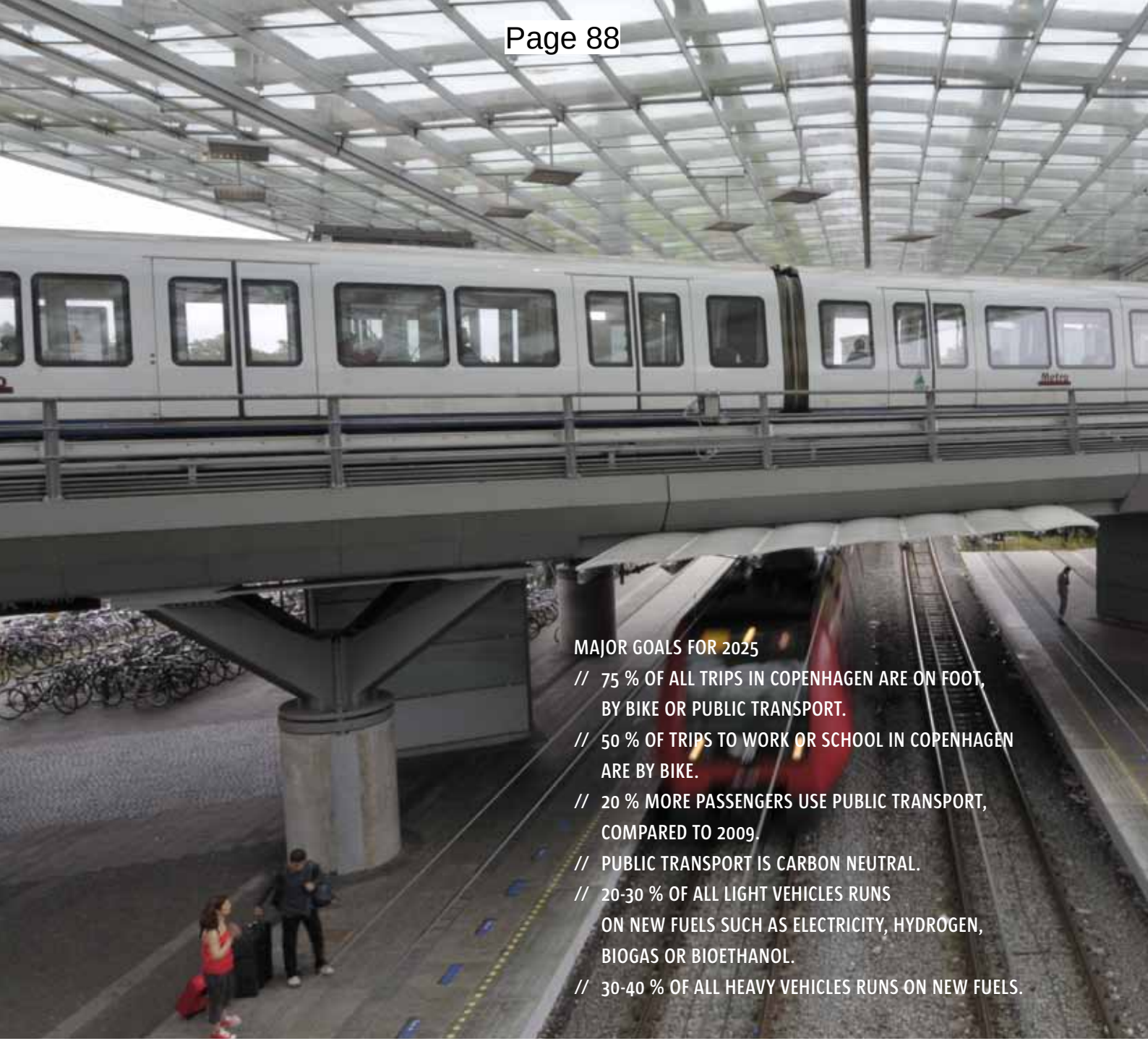
- A wood-fired combined heat and power plant of 115-350 MW, representing an investment of DKK 1.5-4 bn
- A geothermal plant (65 MW), representing an investment of about DKK 1 bn
- A heat storage tank (capacity 200 MW), representing an investment of DKK 0.2 bn

Initiatives in the area of waste management are rate funded. It is estimated that a REnescience plant with a capacity of 80,000 tons of waste per year costs DKK 0.8 bn in capital expenditure, while a biogas plant with a capacity of 50,000 tons of waste per year is estimated to cost DKK 120-150 million in capital expenditure.

**MORE THAN 100 WIND TURBINES ARE SCHEDULED TO BE INSTALLED BY 2025 - INSIDE AS WELL AS OUTSIDE THE MUNICIPAL BOUNDARY**

# GREEN MOBILITY


5A Sundbyvester Plads
movia
6495
HOTEL



MAJOR GOALS FOR 2025

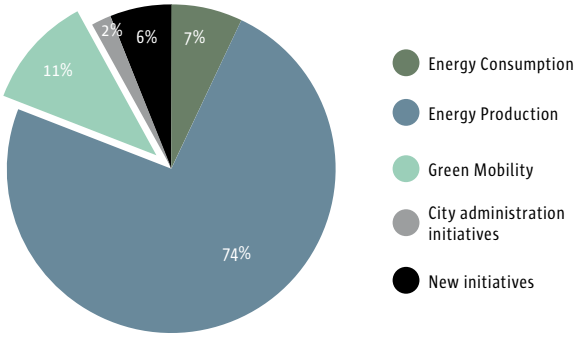
// 75 % OF ALL TRIPS IN COPENHAGEN ARE ON FOOT, BY BIKE OR PUBLIC TRANSPORT.
// 50 % OF TRIPS TO WORK OR SCHOOL IN COPENHAGEN ARE BY BIKE.
// 20 % MORE PASSENGERS USE PUBLIC TRANSPORT, COMPARED TO 2009.
// PUBLIC TRANSPORT IS CARBON NEUTRAL.
// 20-30 % OF ALL LIGHT VEHICLES RUNS ON NEW FUELS SUCH AS ELECTRICITY, HYDROGEN, BIOGAS OR BIOETHANOL.
// 30-40 % OF ALL HEAVY VEHICLES RUNS ON NEW FUELS.

# TAKING THE BUS OR GOING BY BIKE MUST BE MADE EVEN MORE ATTRACTIVE.

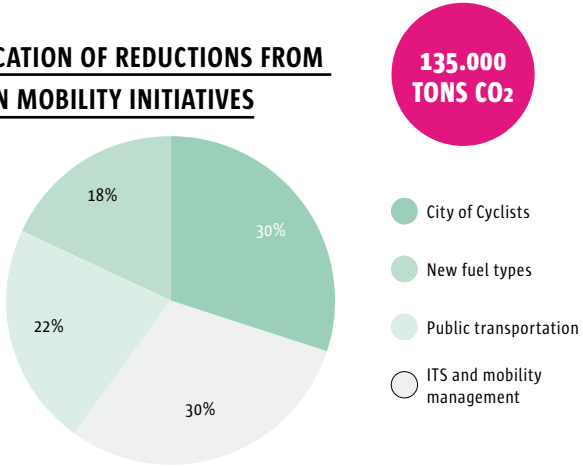
Copenhageners must either go by bike, walk or take public transport when they are getting around in the city. Transport causes a large proportion of the total carbon emissions. In 2010, transport in Copenhagen alone caused 22 % of the total volume of carbon discharged. So, Copenhagen has set a goal that by 2025, at least 75 % of all trips must be done on foot, by bike or public transport. If Copenhageners do go by car, the aim is that as many as possible use electric, or hybride and hydrogen cars, while heavier vehicles should run on new fuels such as biogas.

With an expected 100,000 more Copenhageners and 20,000 new jobs, there must also be focus on how easy it is for people to reach their destination. In a growing city, it is crucial that mobility remains high and that the limited room in the urban space is used optimally, so the city can develop in a green, smarter and healthier direction as 2025 approaches.

## SHARE OF TOTAL CARBON REDUCTION




## ALLOCATION OF REDUCTIONS FROM GREEN MOBILITY INITIATIVES



## MAIN INITIATIVES

### ON THE WAY TO BEING THE WORLD'S BEST CITY FOR CYCLISTS

Copenhagen is already a world class city for cyclists. But the potential and our ambition are greater, and new initiatives are needed to get even more people to cycle. The goal is that at least 50 % of all trips to work or educational institutions will be by bike.

- Bicycle connections to and from Copenhagen should be developed. Among other things, most of the PLUSnet should have cycle tracks with three lanes.
- Development of partnerships supporting innovation of cyclism solutions.
- Copenhagen business life must become involved in relation to spreading the use of electrical bikes for long rides in the Copenhagen area.
- Development of a concept on improved conditions for cyclists in order to promote the use of bicycles at workplaces.

### CARS ON ELECTRICITY, HYDROGEN AND BIO FUELS

Copenhagen will work to increase the use of electric vehicles, hydrogen-electric vehicles and heavy vehicles running on biofuels. 96 % of all car trips in Denmark are shorter than 50 km, so there is a basis for a large market in electric cars. A nationwide and differentiated infrastructure will allow electric cars to cover the less common driving needs for longer journeys.

- Through demonstration projects, the City of Copenhagen will contribute to the development and wider use of new fuels in transport.
- Electric charging points and hydrogen filling stations will be set up and the possibilities for a secure infrastructure for biofuels will be explored.
- Collaboration with industry and other public authorities will promote the purchase of vehicles operating on the new electricity, hydrogen and biofuels.

### PUBLIC TRANSPORT MUST BE USED MORE

Public transport is very visible in the Copenhagen cityscape, and in Copenhagen there are about 750,000 users of the bus, Metro or S-trains (suburban) daily. The goals is that 20 % more people will use public transport which will be carbon neutral by 2025. This transformation will also contribute to less noise and air pollution.

- Experiments with electricity and biofuels as a propellant in large buses will be initiated. This will be done through operational trials with Movia.
- The public transport system must be improved, which includes improving conditions at nodal points, as well as taking measures to make it easier for road users to get to their destination and to provide better traffic information.
- Efficient use of energy in the metro and commuter trains.

### INTELLIGENT TRAFFIC MANAGEMENT IMPROVES TRAFFIC FLOW

Technology has been developing very rapidly in recent years, creating new opportunities for traffic planning and traffic management which can improve traffic flow and reduce carbon emissions. In the coming years, the City of Copenhagen will create the conditions for these opportunities to be realised.

- Through traffic planning and traffic management, the City of Copenhagen will reduce carbon emissions from traffic by optimising conditions for bicycles, busses and cars. Travelling time on busses will be cut by 10 % and their regularity improved by 20 %.

### MOBILITY PLANNING

The demand for green modes of transport must be increased. The large investment in public transport, cycle tracks and technologies for new vehicles will in itself make carbon neutral transport more attractive to use, but the public's knowledge of the various modes of transport needs to be increased through information and campaigns.

- A business network will be set up which will help companies to make transport plans.
- Collaboration with local groups about direct offers and information to citizens about transport opportunities.
- The travelling habits of Copenhageners must be changed through campaigns to provide information and change behaviour.

## ECONOMY

The City of Copenhagen expects that initiatives connected with the City of Cyclists will require investments of around DKK 600 million between now and 2025. Of these, DKK 520 million will go to PLUSnet. Besides the actions associated with CPH 2025 Climate Plan, it will cost the City of Copenhagen about DKK 1 bn to develop the cycling city further.

The annual cost of bus operations in and through Copenhagen is now DKK 930 million. Of this, the City of Copenhagen contributes with DKK 400 million. In the light of the Danish Energy Agency's latest report on alternative fuels, it has been estimated that the municipality needs to designate a total of about DKK 290 million to carbon neutral public transport and bus infrastructure from now until 2025.

The municipality's total investment in intelligent traffic management is expected to be about DKK 300 million for the period 2013-2025. This does not include the establishment of a traffic management system.

The total investment for the mobility program and long-term attitude change up until 2025 is expected to reach DKK 50 million.

# CITY ADMINISTRATION INITIATIVES

MAJOR GOALS FOR 2025

// REDUCE ENERGY CONSUMPTION IN MUNICIPAL BUILDINGS BY 40 %, COMPARED TO 2010.
// MUNICIPAL NEW BUILD UP TO 2015 MEETS THE REQUIREMENTS OF THE 2015 CLASSIFICATION AND UP TO 2020 NEW BUILD MEETS THE REQUIREMENTS OF THE 2020 CLASSIFICATION.
// THE CITY OF COPENHAGEN'S VEHICLES RUN ON ELECTRICITY, HYDROGEN OR BIOFUELS.
// THE ENERGY CONSUMPTION FOR STREET LIGHTING IN COPENHAGEN IS HALVED, COMPARED TO 2010.
// A TOTAL OF 60,000 SQ M SOLAR PANELS ON EXISTING MUNICIPAL BUILDINGS AND MUNICIPAL NEW BUILD IS INSTALLED.

# THE CITY OF COPENHAGEN MUST RAISE THE BAR FOR WHAT CAN BE ACHIEVED THROUGH ENERGY OPTIMIZATION AND CARBON REDUCTION.

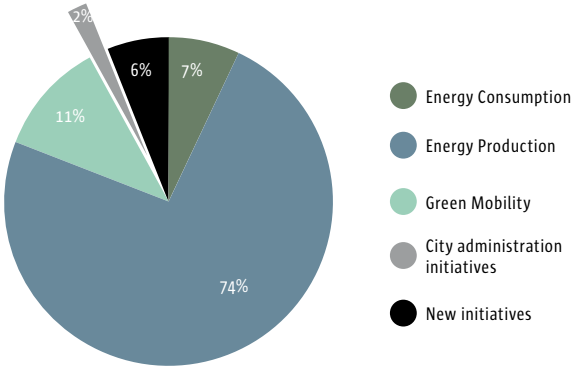
The City administration will set ambitious climate and environmental requirements for its own operations and for those of suppliers. There are excellent opportunities as a purchaser to move the market in a climate friendly direction, while as a developer and property owner, it is possible to build low energy and climate-adapted buildings.

The City of Copenhagen will collaborate with knowledge institutions and private and public players to create and disseminate new knowledge as well as gathering experience of the particular building processes, solutions for energy retrofitting, climate adapted new build and user behaviour.

This collaboration will ensure green growth through the development of new technology, services and competences in the environment and climate sector.

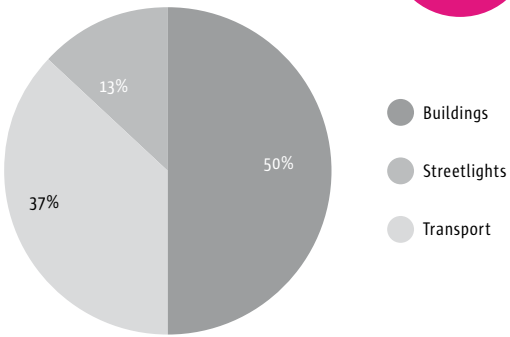
Through communication, education and behavioural campaigns, the municipality will also inspire its 45,000 employees to climate-friendly actions - both at work and in their private lives.

## SHARE OF TOTAL CARBON REDUCTION




## ALLOCATION OF REDUCTIONS FROM CITY ADMINISTRATION INITIATIVES

20.000 TONS $CO_2$



## MAIN INITIATIVES

### ENERGY CONSUMPTION IN MUNICIPAL BUILDINGS MUST BE REDUCED

Running the municipal buildings accounts for the vast majority of energy consumption, and thus of carbon emissions, in the City of Copenhagen. A reduction of 40 % in energy consumption is ambitious, but achievable with a concentrated effort:

- Systematic charting and recording of energy consumption as well as energy management and environmentally correct operation
- Long-term energy saving measures and climate adaptation must be included in major retrofitting and refurbishment.
- Municipal new build until 2015 must follow the requirements of the 2015 classification and up to 2020 must follow the 2020 classification. Amongst other actions, pilot projects will be carried out for climate retrofitting and for climate adapted low energy new buildings.
- In total 60,000 sq meters of solar panels will be installed on both existing municipal buildings and on municipal new build.

THE CITY OF COPENHAGEN HAS A GOOD OPPORTUNITY TO MOVE THE MARKET IN A MORE ENVIRONMENTALLY CONSCIOUS DIRECTION THROUGH THE VOLUME OF ITS PURCHASING POWER

### THE CITY ADMINISTRATION MUST DRIVE GREEN

Copenhagen is taking the lead by switching over to electric and hydrogen powered cars, thus showing that the ambitious targets are being backed by actions.

- The municipality's passenger cars must be electric and hydrogen powered; an infrastructure is being developed for charging stations for electric and hydrogen vehicles.
- Larger vehicles must use new fuels such as biogas. Copenhagen will be part of a pilot and demonstration phase for alternative fuel technologies for heavy vehicles.
- All external suppliers will be required to use electricity, hydrogen or biofuels when driving for the City of Copenhagen.

### CLIMATE AND ENVIRONMENTAL REQUIREMENTS WILL ENSURE GREEN PROCUREMENT

Through the size and volume of its purchasing power, the city administration has a good opportunity to move the market in a more climate and environmentally conscious direction.

- Climate and environmental requirements must be introduced in more areas of procurement than today. This must include the implementation of procurement strategies, focusing on transport, energy consuming products and the area of buildings and plant.

### STREET LIGHTING

A large part of the city administration's reduction in carbon emissions can be found by changing the street lighting

- In the period 2011-2014, about 11,000 mercury fittings will be replaced.
- From 2014 over the following three to four years, about 20,000 fluorescent lamps and sodium fitments will be replaced.

**CLIMATE TRAINED EMPLOYEES**

Employees in the city administration play a considerable role when it is a matter of creating a culture in which climate and the environment are in focus on a daily basis.

- Copenhagen encourages its employees' good climate behaviour and teaches its operating staff in procurement, transportation and energy efficient operation and consumption. All new employees in the municipality are introduced to the municipality's carbon goals and climate-friendly habits and routines.

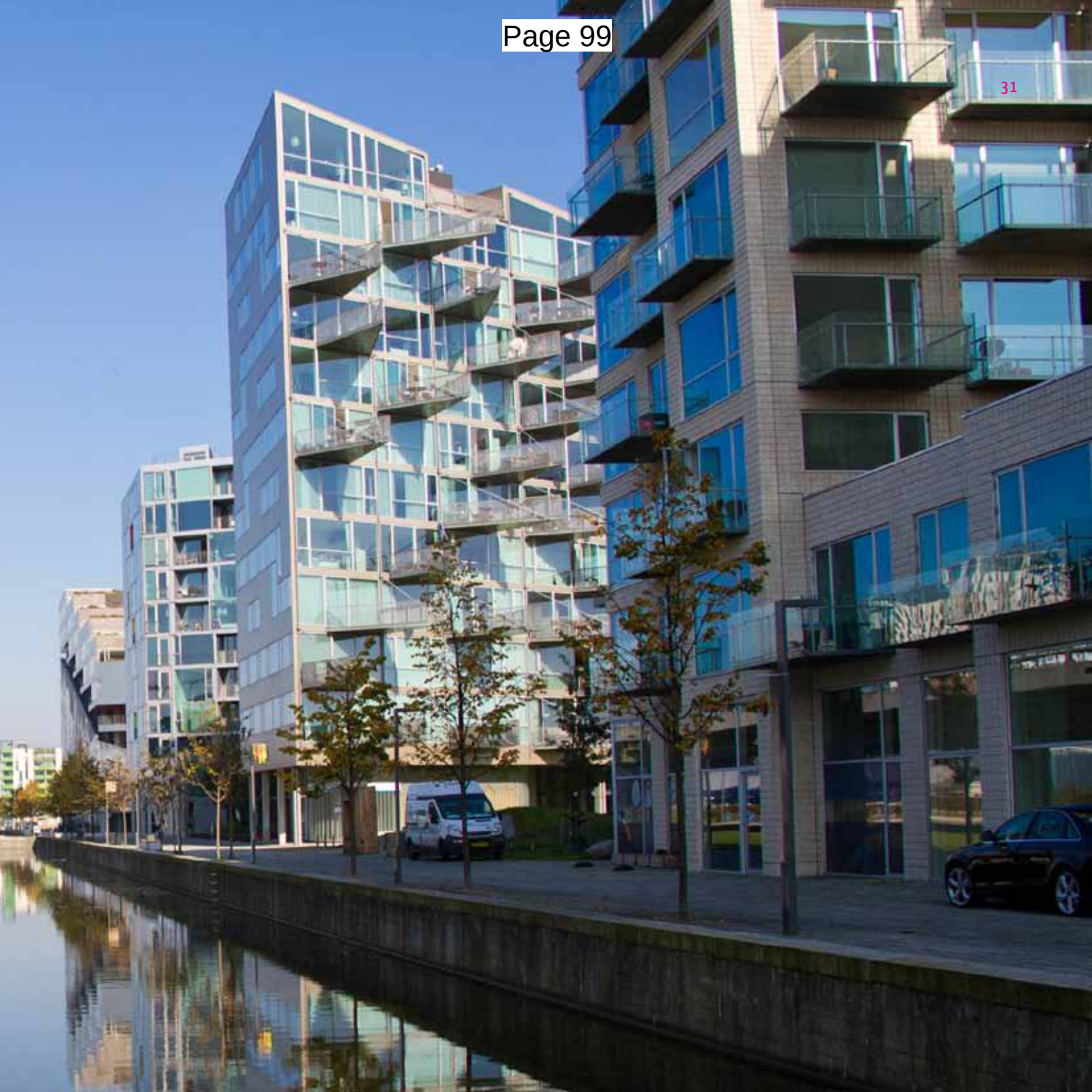
## ECONOMY

The combined investment in the City of Copenhagen as a climate organisation will be in the region of DKK 1 bn up to 2025 after energy savings and other lower operational expenses have been deducted.

The two major items are climate retrofitting and climate adaptation of municipal buildings together with replacement of street lighting. The cost of climate retrofitting and adaptation by 2025 will amount to a total of about DKK 1.4 bn, resulting in operational savings of about DKK 0.6 bn over this period. The cost of converting the street lights to LED totals about DKK 270 million, giving an overall saving on electricity bills during the period of about DKK 140 million.

Most initiatives will result in economic savings as early as 2014 but the full savings will not be achieved until the measures are fully implemented.

# ECONOMY AND INVESTMENTS



# THE CPH 2025 CLIMATE PLAN GIVES A POSITIVE ECONOMIC PICTURE AND THE INVESTMENTS IN THE PLAN RESULT IN APPROXIMATELY 30.000 FULL-TIME EQUIVALENTS (FTE).

In the period up to 2025, a range of investments will be made independently of the climate plan, in those areas which the CPH 2025 Climate Plan covers. New buildings will be erected, existing buildings will be retrofitted, investment will be made in new energy production plants, new cars will be bought and so on.

It is expected that around DKK 200-250 bn will be invested in the fields of energy consumption, energy production and mobility up until 2025. The CPH 2025 Climate Plan's initiatives mean that there will be an additional investment of around DKK 20-25 bn. These amounts should be considered in conjunction with the municipal investment, which is expected to be around DKK 2.7 bn up to 2025.

The positive economic picture associated with a carbon neutral Copenhagen is primarily due to the expected rise in price of conventional energy sources like coal, oil and gas. This makes green transformation a good investment in the light of what the alternative cost would be if Copenhagen still met most of its energy needs with fossil fuels. In addition, the reduction of greenhouse gas emissions generally makes for a better economy in a city like Copenhagen than in the country as a whole. The reason is that many climate measures also help to increase Copenhageners' health and quality of life by reducing congestion, noise and particle pollution. These benefits are far greater in a city like Copenhagen, where actions have an effect on many people simultaneously compared with other cities in Denmark.

Costs are also kept down by using the following principles in the preparation of the CPH 2025 Climate Plan:

- The transformation takes place gradually and over a long time.
- Sound financial initiatives are set in motion as soon as possible.
- The shift to green transport, which is relatively expensive, starts with development projects in most cases.
- As well as reducing carbon emissions, initiatives must, as far as possible, also create green growth and enhance the quality of life.

THE MANY CLIMATE MEASURES HELP TO INCREASE COPENHAGENERS' HEALTH AND QUALITY OF LIFE BY REDUCING CONGESTION, NOISE AND PARTICLE POLLUTION

THE INVESTMENTS IN THE CPH 2025 CLIMATE PLAN WILL RESULT IN JOBS EQUIVALENT TO APP. 30.000 MAN YEARS

**MORE PEOPLE WILL BE EMPLOYED IN THE GREEN SECTOR**

With its own effort up to 2025, the City of Copenhagen will be supporting both directly and indirectly massive investments in green growth. These investments will have a significant impact on employment in the green sector and provide opportunities for a number of innovation projects in Copenhagen in the period.

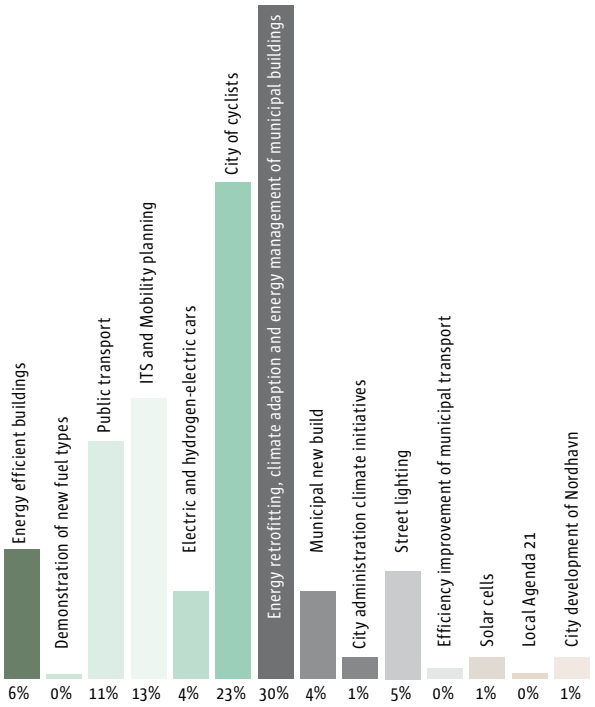
The extent to which investment creates new jobs will depend on general economic development; it will be possible to make an assessment for each project over a shorter period of time.

Based on the amount invested, a qualified estimate of the effect on employment of the initiatives over a longer period of time up to 2025 has been made.

**EFFECT ON EMPLOYMENT OF CPH 2025 CLIMATE PLAN**

| GREEN INVESTMENT | DKK MILLION | JOBS PR. MILLION INVESTED | EFFECT ON EMPLOYMENT (MAN YEARS) |
|---|---|---|---|
| Municipal investment | 2.700 | 1,3 | 3.000 |
| New build: Additional investment (private sector) | 6.000 | 1,3 | 8.000 |
| Retrofitting: New investment in energy retrofitting | 3.500 | 1,3 | 4.500 |
| Energy production | 10.000-15.000 | 1,3 | 13.000-19.500 |
| **TOTAL** | **22.000-27.000** | | **28.500-35.000** |

*Source: AE og 3F: Jf. "Environment, energy and employment – main report" ("Miljø, energi og beskæftigelse – Hovedrapport"), 3F and the Ecological Council, 2005 (3F og Det Økologiske Råd, 2005).*




// Combined municipal investments 2013-2025.

CITY OF COPENHAGEN
THE TECHNICAL AND ENVIRONMENTAL ADMINISTRATION
POSTBOX 457
1505 KØBENHAVN V
WWW.KK.DK/CLIMATE

SEPTEMBER 2012
LAYOUT // TMF GRAPHIC DESIGN
PHOTO // URSULA BACH, TOBIAS WENSIEN DINESEN,
KLAUS HJERRILD
PRINT // FORMULA

NORDISK MILJØMÆRKNING
TRYKSAG
541 510

Annex E

# Setting Climate Committments for York

## Quantifying the implications of the United Nations Paris Agreement for York

| | |
|---|---|
| **Date:** | October 2019 |
| **Prepared By:** | Dr Jaise Kuriakose, Dr Chris Jones, Prof Kevin Anderson, Dr John Broderick & Prof Carly McLachlan |

NB: All views contained in this report are solely attributable to the authors and do not necessarily reflect those of the researchers within the wider Tyndall Centre.

## Key Messages

This report presents climate change targets for York[i] that are derived from the commitments enshrined in the Paris Agreement [1], informed by the latest science on climate change [2] and defined in terms of science based carbon setting [3]. The report provides York 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 [1][ii]. The UK budget is then split between sub-national areas using different allocation regimes [4]. Aviation and shipping emissions remain within the national UK carbon budget and are not scaled down to sub-national budgets. Land Use, Land Use Change and Forestry (LULUCF) and non-$CO_2$ emissions are considered separately to the energy $CO_2$ budget in this report.

Based on our analysis, for York to make its 'fair' contribution towards the Paris Climate Change Agreement, the following recommendations should be adopted:

1. Stay within a maximum cumulative carbon dioxide emissions budget of 5.4 million tonnes ($MtCO_2$) for the period of 2020 to 2100. At 2017 $CO_2$ emission levels[iii], York would use this entire budget within 7 years from 2020.
2. Initiate an immediate programme of $CO_2$ mitigation to deliver cuts in emissions averaging a minimum of -13.0% per year to deliver a Paris aligned carbon budget. These annual reductions in emissions require national and local action, and could be part of a wider collaboration with other local authorities.
3. Reach zero or near zero carbon no later than 2042. This report provides an indicative $CO_2$ reduction pathway that stays within the recommended maximum carbon budget of 5.4 $MtCO_2$. At 2042 5% of the budget remains. This represents very low levels of residual $CO_2$ emissions by this time, or the Authority may opt to forgo these residual emissions and cut emissions to zero at this point. Earlier years for reaching zero $CO_2$ emissions are also within the recommended budget, provided that interim budgets with lower cumulative $CO_2$ emissions are also adopted.

# 1. Introduction

This report presents advisory climate change targets for York to make its fair contribution to meeting the objectives of the United Nations Paris Agreement on Climate Change. The latest scientific consensus on climate change in the Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5°C [2] is used as the starting point for setting sub-national carbon budgets [3, 4] that quantify the maximum carbon dioxide ($CO_2$) associated with energy use in York that can be emitted to meet this commitment. This report translates this commitment into;

1. a long-term carbon budget for York;
2. a sequence of recommended five-year carbon budgets;
3. a date of 'near zero'/zero carbon for the area.

The United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement commits the global community to take action to "hold the increase in global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C" [1]. Cumulative emissions of $CO_2$ from human activity are the principle driver of long-term global warming[iv]. It is the relationship between $CO_2$ and global temperatures which means that staying within a given temperature threshold requires that only a certain total quantity of $CO_2$ is released to the atmosphere. This is the global carbon budget.

In addition to setting global average temperature targets, the UNFCCC process also includes foundational principles of common but differentiated responsibility [1]. This informs the fair (equitable) distribution of global emissions between nations at different stages of economic development. Industrialised nations are expected to show leadership towards a low carbon future, while it is acknowledged that a greater total share of future emissions will be associated with other countries as they develop (though their emissions per capita will remain low). Any sub-division of the global carbon budget must therefore account for the development needs of what the Paris Agreement refers to as "developing country Parties" in setting a fair/equitable national or sub-national carbon budget.

The carbon budgets presented here apply to $CO_2$ emissions from the energy system only. Although all greenhouse gas (GHG) emissions, such as methane and other forcing agents, such as aircraft contrails, affect the rate of climate change, long term warming is mainly driven by $CO_2$ emissions [5]. Furthermore the physical or chemical properties of each GHG vary, with different life-times causing warming in different ways, and with subsequent, and often large, uncertainties in their accounting [6]. As such the global carbon budgets in the Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5°C (SR1.5) [2], relate to $CO_2$-only emissions. In this report we have discussed non-$CO_2$ emissions and $CO_2$ emissions associated with land use, land use change and forestry separately.

Ultimately staying within a global temperature threshold (e.g. "well below 2°C") requires limiting cumulative $CO_2$ emissions over the coming decades. Carbon budgets can be an effective way to understand the amount of $CO_2$ emissions that can be released into the atmosphere in order to do this. End point targets such as 'net zero' by 2050, with very clear assumptions, can be useful indicators of ambition, but it is ultimately the cumulative $CO_2$ released on the way to that target that is of primary significance to achieving climate change goals. Whereas end point focused targets can be met with varying levels of $CO_2$ emissions (and therefore varying global temperature with consequent climate impacts) depending on their reduction pathways, carbon budgets specify the limits to $CO_2$ emissions within

the period of the commitment. This is a reason why the Climate Change Act has legislated 5-year carbon budget periods, as well as a long term target, to keep $CO_2$ emissions consistent with the framing goal of the climate change commitment. It is also the reason why we recommend a carbon budget based approach.

### 1.2 Wider UK Policy Context

The UK Climate Change Act now legislates for a commitment to net zero greenhouse gas emissions by 2050[v], with five yearly carbon budgets to set actions and review progress [7]. The carbon budgets for this target were not available at the time of our analysis for direct comparison, however the recommended budget in this report will most likely be more stringent. This is primarily due to two key differences between our approach and the current recommendations of the UK Government's advisory body the Committee on Climate Change (CCC) that inform the revised UK net zero target:

1. The equity principles of the Paris Agreement and wider UNFCCC process are explicitly and quantitatively applied. Our approach allocates a smaller share of the global carbon budget to the 'developed country Parties', such as the UK, relative to 'developing country Parties'. Moreover the approach is also distinct in including global 'overheads' for land use, land use change and forests (LULUCF) and cement process emissions related to development.
2. Carbon dioxide removals via negative emissions technologies (NETs) and carbon offsets[vi] are not included. The UK Climate Change Act's 'net zero' framing means that the commitment is met when greenhouse gas emissions (debits) and removals (credits) from the UK's carbon 'account' balance at zero. Hence the 2050 target can be met using carbon dioxide removal technologies, including land use sequestrations, and potentially carbon offsetting. The CCC include a significant role for NETs such as bioenergy carbon capture and storage and direct air capture in their analysis supporting the net zero target. Doing so theoretically increases the size of a carbon budget, but increases the risk of failing to deliver on the Paris global temperature target. The UK Government has also rejected the CCC's advice to explicitly exclude international carbon offsetting as an approach to meeting the net zero target. Allowing for future carbon dioxide removal technologies and international carbon offsetting ostensibly increase the size of the UK's carbon budget. However carbon removal technologies are at a very early stage of development and whether they can be successfully deployed at sufficient scale is highly uncertain. While they are an important technology to develop, it is a major risk to prematurely adopt a carbon budget that allows for additional $CO_2$ on the basis that future generations will be in a position to deploy planetary-scale NETs. Similarly, as the CCC note in their advice, the efficacy of carbon offsetting as a contribution to meeting global climate change commitments is not robust enough to incorporate into recommended carbon budgets.

We regard our UK carbon budget to be at the upper end of the range that is aligned with the Paris Agreement's objectives. Early results from the latest Earth system models suggest that the climate may be more sensitive to greenhouse gases than previously thought implying a smaller global carbon budget is required [8]. In addition, assuming that developing countries will, on aggregate, implement rapid emissions reduction measures in line with a 2025 peak year is far from certain. Therefore, we recommend that these budgets are taken as reflective of the minimum commitment required to deliver on the Paris Agreement.

## 2. Method

The Setting City Area Targets and Trajectories for Emissions Reduction (SCATTER) project [4] funded by the Department for Business Energy and Industrial Strategy (BEIS) developed a methodology for Local Authorities to set carbon emissions targets that are consistent with United Nations Paris Climate Agreement. This report uses the SCATTER methodology with revised global carbon budgets, based on the latest IPCC Special Report on 1.5°C and updated $CO_2$ emissions datasets, to downscale global carbon budgets to York. This methodology has been successfully piloted with Greater Manchester Combined Authority and is being made available nationally to support all local authorities and groupings of local authorities.

**Step 1:** A global carbon budget of 900 $GtCO_2$ is taken from the Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5ºC [2]. This global carbon budget represents the latest IPCC estimate of the quantity of $CO_2$ that can be emitted and still be consistent with keeping global temperatures well below 2ºC with an outside chance of stabilising at 1.5 ºC. This budget assumes no reliance on carbon removal technologies.

**Step 2:** A 'global overhead' deduction is made for process emissions arising from cement production (60 $GtCO_2$) [9][vii]. Cement is assumed to be a necessity for development [5]. We also assume that there is no net deforestation at a global level (2020 to 2100) so none of the global carbon budget is allocated to this sector. This will require a significant global effort to rapidly reduce deforestation and significantly improve forestry management as well as increase rates of reforestation and potentially afforestation.

**Step 3:** A share of the global carbon budget is allocated to "developing country parties" assuming a trajectory for those countries from current emissions to a peak in 2025 then increasing mitigation towards zero emissions by around 2050. The remaining budget is allocated to "developed country parties" which includes the UK [10]. This approach of considering developing countries first, is guided by the stipulation of equity within the Paris Agreement (and its earlier forebears, from Kyoto onwards)[10].

**Step 4:** The UK is apportioned a share of the 'developed country Parties' budget after Step 3 to provide a UK national carbon budget. The apportionment is made according to "grandfathering"[viii] of emissions for the most recent period up to the Paris Agreement (2011 to 2016).

**Step 5:** Aviation and shipping emissions are deducted. Assumptions and estimates are made about the level of future emissions from aviation, shipping and military transport for the UK. These emissions are then deducted from the national budgets as a 'national overhead" to derive final UK energy only carbon budgets. Emissions from aviation including military aircraft are assumed to be static out to 2030, followed by a linear reduction to complete decarbonisation by 2075. The total $CO_2$ emissions of this path are >25% lower than Department for Transport central forecast followed by reduction to zero by 2075. Shipping emissions are based on Walsh et al [11] 'big world' scenario out to 2050 followed by full decarbonisation from this sector by 2075. These aviation and shipping emissions (1,518 $MtCO_2$) are then deducted as a 'national overhead' from the UK budget to derive the final carbon budgets for the UK, from which local authority budgets are subsequently derived [4]. The budgets provided are therefore aligned with "well below 2°C and pursuing 1.5°C" provided that aviation and shipping emissions do not exceed the pathway assumed in our analysis [4]. Failure to hold aviation and shipping emissions within the outlined allocation will reduce the carbon budget for UK regions, including for York.

**Step 6:** York is apportioned a part of the remaining UK budget. Our recommended budget is based on sub-national allocation through 'grandfathering'. A grandfathering approach allocates carbon budgets on the basis of recent emissions data. The most recent annual $CO_2$ emissions for York up to the Paris Agreement [12] (2011-2016) is averaged and compared to averaged data for the whole UK [13] over the same period. The carbon budget (2020-2100) for York is then apportioned based on York's average proportion of UK $CO_2$ emissions for the 2011-2016 period. $CO_2$ emissions in the carbon budget include emissions from fossil combustion within the region and a share of the emissions from national electricity generation (relative to the York area's end-use electricity demand).

**Step 7: Carbon emission pathways.** The carbon budgets for York are related to a set of illustrative emission pathways. These pathways show projected annual $CO_2$ emissions from energy use in York and how these emissions reduce over time to stay within the budget. The energy-only $CO_2$ emissions for 5-yearly interim carbon budget periods are calculated in line with the framework set out in the UK Climate Change Act. It is the cumulative carbon budget and the 5 year interim budgets that are of primary importance as opposed to a long term target date. The combination of a Paris-compliant carbon budget and the projected emissions pathways can however be used to derive an indicative near zero carbon target year for York. The near zero carbon year of 2042 is defined here as the point at which, on the consistent reduction rate curve, less than 5% of York's recommended budget remains. Annual $CO_2$ emissions at this point fall below 0.03 $MtCO_2$ ($CO_2$ levels >96% lower than in 2015 – a Paris Agreement reference year).

# 3. Results

## 3.1 Energy Only Budgets for York

Following the Method the recommended energy only $CO_2$ carbon budget for the York area for the period of 2020 to 2100 is 5.4 $MtCO_2$. To translate this into near to long term commitments a $CO_2$ reduction pathway within the 5.4 $MtCO_2$ is proposed here. A consistent emissions reduction rate of -13.0% out to the end of the century is applied. In 2042 95% of the recommended carbon budget is emitted and low level CO2 emissions continue at a diminishing level to 2100.

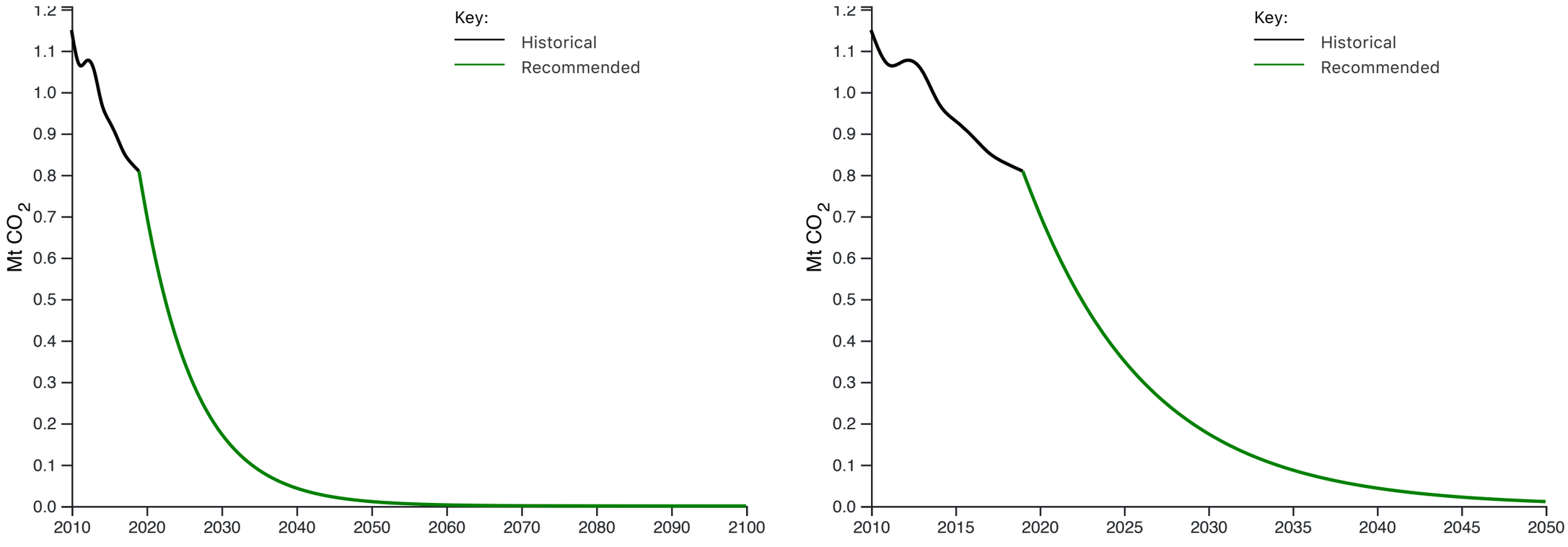



***Figure 1a (left):*** *Energy related $CO_2$ only emissions pathways (2010-2100) for York premised on the recommended carbon budget.* ***Figure 1b (right):*** *Energy $CO_2$ only emissions pathways (2010-2050) for York premised on the recommended carbon budget.* ***y-axis shows emissions in $MtCO_2$***

Table 1 presents the York energy $CO_2$ only budget in the format of the 5-year carbon budget periods in the UK Climate Change Act. To align the 2020 to 2100 carbon budget with the budget periods in the Climate Change Act we have included estimated $CO_2$ emissions for York for 2018 and 2019, based on BEIS provisional national emissions data for 2018 [14] and assuming the same year on year reduction rate applied to 2019. The combined carbon budget for 2018 to 2100 is therefore 7.0 $MtCO_2$.

***Table 1:*** *Periodic Carbon Budgets for 2018 for York.*

| **Carbon Budget Period** | **Recommended Carbon Budget (**Mt $CO_2$**)** |
|---|---|
| **2018 - 2022** | 3.5 |
| **2023 - 2027** | 1.8 |
| **2028 - 2032** | 0.9 |
| **2033 - 2037** | 0.4 |
| **2038 - 2042** | 0.2 |
| **2043 - 2047** | 0.1 |
| **2048 - 2100** | 0.1 |

The recommended budget is the maximum cumulative $CO_2$ amount we consider consistent with York's fair contribution to the Paris Agreement. A smaller carbon budget, with accelerated reduction rates and an earlier zero carbon year, is compatible with this approach. It is however important that for an alternative zero carbon year the

proposed 5 year budget periods are the same or lower than those specified in Figure 2. Furthermore meeting the budget must not rely on carbon offsets.

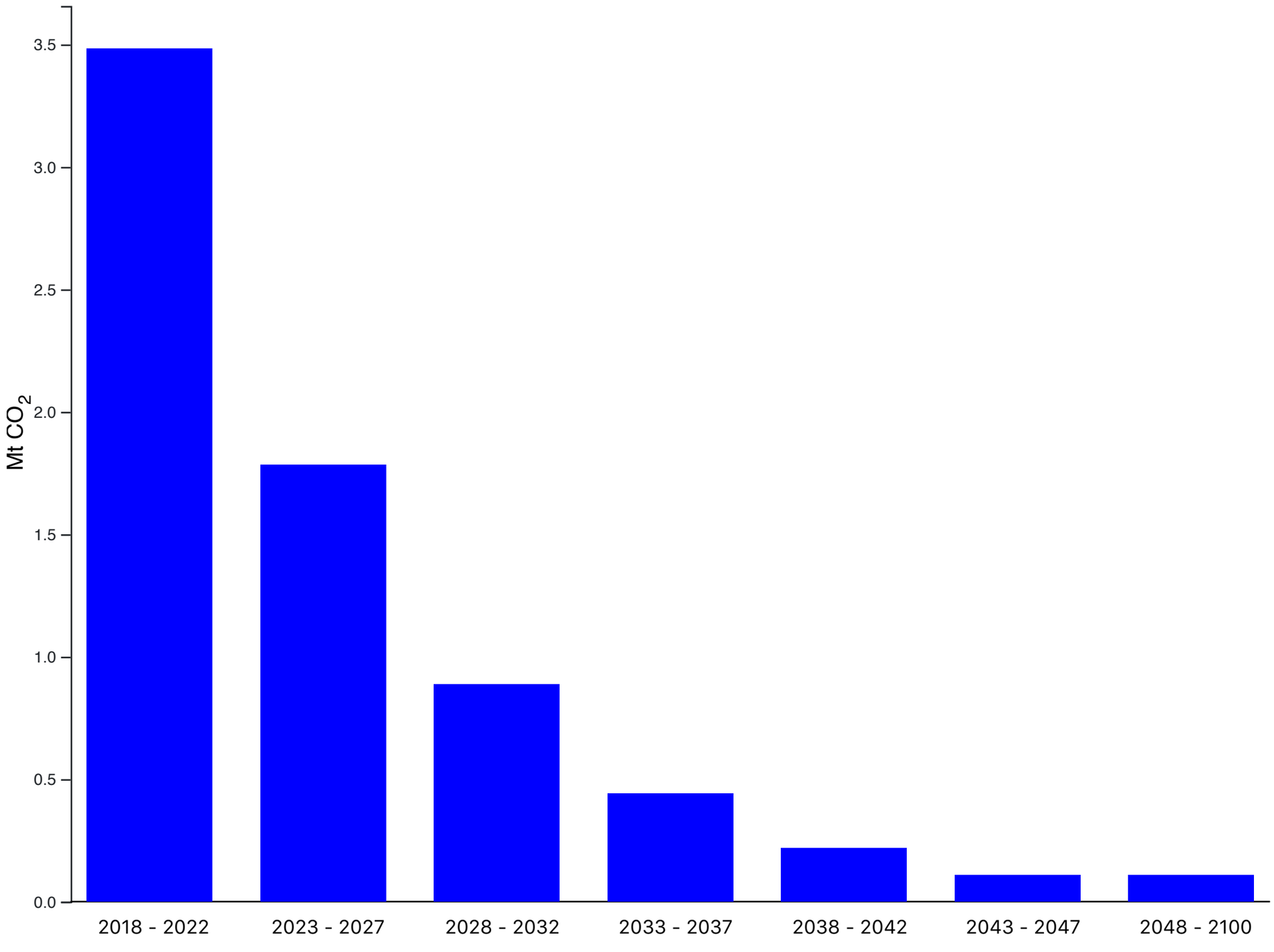



***Figure 2:*** *Cumulative $CO_2$ emissions for budget period (based on Table 1) from 2018 to 2100 for York*

### 3.2 Recommended Allocation Regime for Carbon Budget

The recommended carbon budget is based on a grandfathering allocation regime for sub-dividing the UK sub-national energy only carbon budget. There are three distinct allocation regimes that can be applied to determine sub-national budgets. We have opted to recommend one common approach for allocating carbon budgets that can be applied to all Local Authority areas. This enables straightforward compatibility between carbon budgets set at different administrative scales. For example this makes it easier for individual Local Authorities to calculate their own carbon budgets that are compatible with a budget set at Combined Authority scale. It also means that under the recommended carbon budgets, all Authorities are contributing to a common total UK carbon budget. If for example all Authorities selected the allocation regime that offered them largest carbon budget the combined UK budget would not comply with the objectives of the Paris Agreement. The common approach to allocation we recommend therefore further assures that the carbon budget adopted is Paris Agreement compatible.

We have chosen a grandfathering as our common allocation approach because, based on our analysis, it is the most appropriate and widely applicable regime within the UK.

Population and Gross Value Added[ix] (GVA) are alternative allocation regimes. Population shares the carbon budget equally across the UK on a per capita basis. In this allocation regime the UK population [15] is compared to that of York [16] from 2011 to 2016. The carbon budget (2020-2100) for York is then apportioned based on its average proportion of the UK population for the period 2011-2016. For regions where per capita energy demand deviates significantly from the average (e.g. a large energy intensive industry is currently located there) the budget allocated may not be equitable for all regions, therefore it is not recommended as the preferred allocation. GVA is used as an economic metric to apportion carbon budgets. For example, the UK total GVA [17] is compared to that of York [17] from 2011 to 2016. The carbon budget (2020-2100) for York is then apportioned based on York's average proportion of UK GVA for the period 2011-2016. GVA can be useful as a proxy for allocation on economic value,

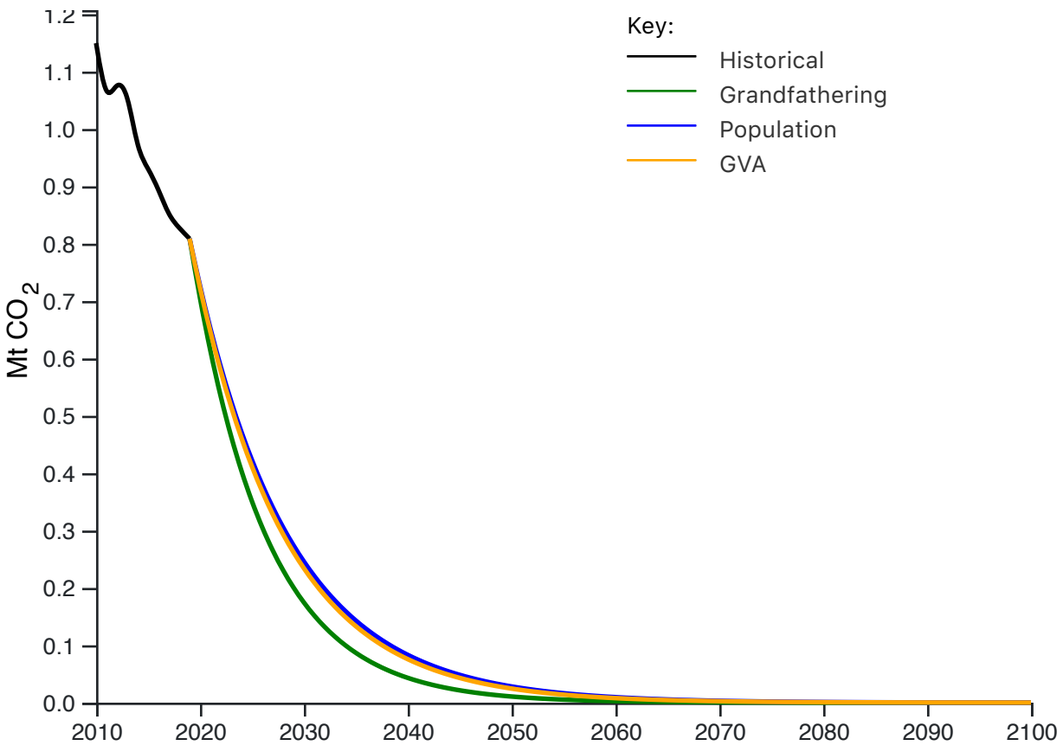
however without an adjustment for the type of economic activity undertaken, areas with high economic 'value' relative to energy use can get a relatively large budget, while the inverse is true for areas with energy intensive industries, and/or lower relative economic productivity. We would therefore not recommend GVA as an appropriate allocation regime for all regions.

Table 2 presents the result outcomes for alterative allocation regimes – population and gross value added (GVA).

***Table 2:*** *Energy only $CO_2$ budgets and annual mitigation rates for York (2020-2100) by allocation regime*

| **Allocation regime (% of UK Budget allocated to York** | **UK Budget[x] ($MtCO_2$)** | **York Budget ($MtCO_2$)** | **Average Annual Mitigation Rate (%)** |
|---|---|---|---|
| **Grandfathering to York from UK (0.2%)** | 2,239 | 5.4 | -13.0% |
| **Population split to York from UK (0.3%)** | 2,239 | 7.1 | -10.3% |
| **GVA split to York from UK (0.3%)** | 2,239 | 6.8 | -10.7% |

Pathway projections for the change in annual energy-only $CO_2$ emissions pathways for York based on the carbon budgets in Table 2 are illustrated in Figure 3a & 3b.



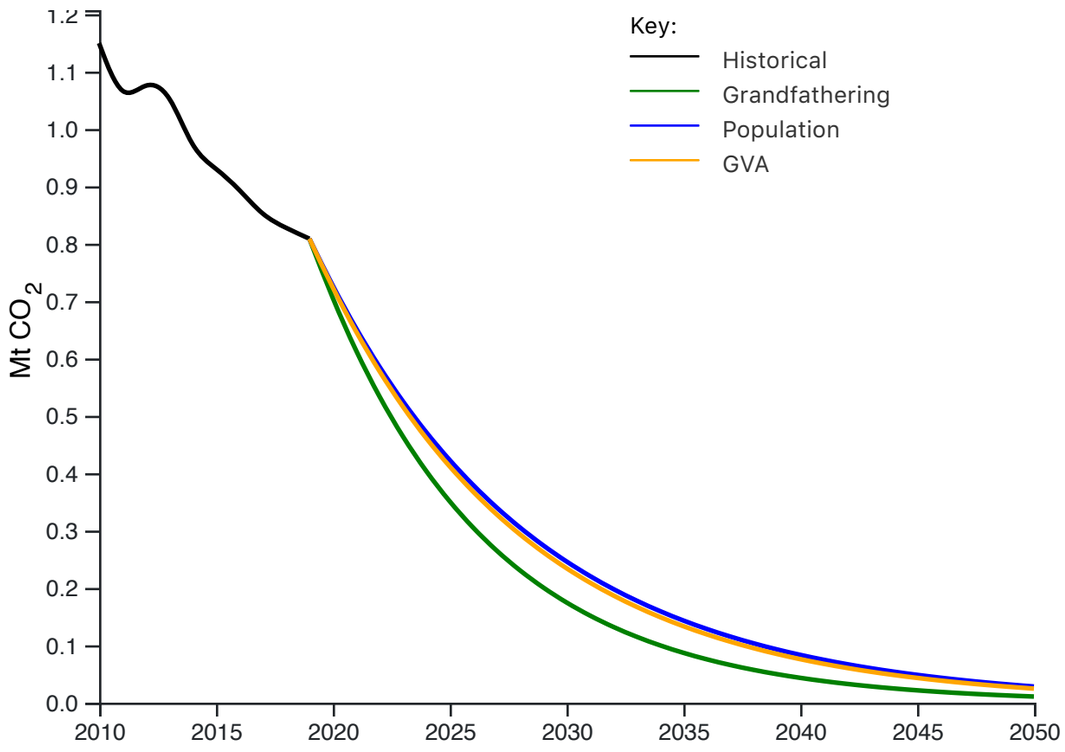




***Figure 3a (left):*** *Energy related $CO_2$ only emissions pathways (**2010-2100**) for York premised on carbon budgets shown in Table 2.* ***Figure 3b (right):*** *Energy related $CO_2$ only emissions pathways (**2010-2050**) for York premised on carbon budgets shown in Table 2.* ***y-axis shows emissions in $MtCO_2$***

### 3.3 Land Use, Land Use Change and Forestry emissions for York

Land Use, Land Use Change and Forestry (LULUCF) consist of both emissions and removals of $CO_2$ from land and forests. We recommend that $CO_2$ emissions and sequestration from LULUCF are monitored separately from the energy-only carbon budgets provided in this report. York should increase sequestration of $CO_2$ through LULUCF in the future, aligned with Committee on Climate Change's high level ambition of tree planting, forestry yield improvements and forestry management [18]. Where LULUCF is considered, we recommend it compensate for the effects of non-$CO_2$ greenhouse gas emissions (within the geographical area) that cannot be reduced to zero, such as non-$CO_2$ emissions from agriculture.

### 3.4 Non-$CO_2$ Emissions

The IPCC SR1.5 report identifies the importance of non-$CO_2$ climate forcers (for instance methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), sulphur dioxide ($SO_2$) and black carbon) in influencing the rate of climate change. However, a cumulative emission budget approach is not appropriate for all non-$CO_2$ greenhouse gases, as the physical and chemical properties of each leads to differing atmospheric lifetimes and warming effects [19]. There are also substantial relative uncertainties in the scale, timing and location of their effects.

We do not provide further analysis or a non-$CO_2$ emissions reduction pathway in this report. However the global carbon budget in the IPCC Special Report on 1.5°C, that our analysis is based on, assumes a significant reduction in rate of methane and other non-$CO_2$ emissions over time. Therefore to be consistent with carbon budgets York should continue to take action to reduce these emissions.

The Department of Business Energy and Industrial Strategy's Local Authority emissions statistics do not at this time provide non-$CO_2$ emissions data at the regional level. Given the absence of robust non-$CO_2$ emissions data, any non-$CO_2$ emissions inventory by other organisations at scope 1 and 2 for York may form the basis of monitoring and planning for these emissions. We recommend considering the adoption of a LULUCF pathway that includes $CO_2$ sequestration sufficient to help compensate for non-$CO_2$ emissions within York's administrative area.

## 4. Conclusions

The results in this report show that for York 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, then an immediate and rapid programme of decarbonisation is needed. At 2017 $CO_2$ emission levels[xi], York will exceed the recommended budget available within 7 years from 2020. **To stay within the recommended carbon budget York will, from 2020 onwards, need to achieve average mitigation rates of $CO_2$ from energy of around -13.0% per year**. This will require that York rapidly transitions away from unabated fossil fuel use. For context the relative change in $CO_2$ emissions from energy compared to a 2015 Paris Agreement reference year are shown in Table 3.

***Table 3:*** *Percentage reduction of annual emissions for the recommended $CO_2$-only pathway out to 2050 in relation to 2015*

| Year | Reduction in Annual Emissions (based on recommended pathway) |
|---|---|
| **2020** | 24.5% |
| **2025** | 62.4% |
| **2030** | 81.3% |
| **2035** | 90.7% |
| **2040** | 95.4% |
| **2045** | 97.7% |
| **2050** | 98.9% |

The carbon budgets recommended should be reviewed on a five yearly basis to reflect the most up-to-date science, any changes in global agreements on climate mitigation and progress on the successful deployment at scale of negative emissions technologies.

These budgets do not downscale aviation and shipping emissions from the UK national level. However if these emissions continue to increase as currently envisaged by Government, aviation and shipping will take an increasing share of the UK carbon budget, reducing the available budgets for combined and local authorities. **We recommend therefore that York seriously consider strategies for significantly limiting emissions growth from aviation and shipping.** This could include interactions with the UK Government or other local authority and local enterprise partnership discussions on aviation that reflect the need of the carbon budget to limit aviation and shipping emissions growth.

$CO_2$ emissions in the carbon budget related to electricity use from the National Grid in York are largely dependent upon national government policy and changes to power generation across the country. **It is recommended however that York promote the deployment of low carbon electricity generation within the region and where possible influence national policy on this issue**.

**We also recommend that the LULUCF sector should be managed to ensure $CO_2$ sequestration where possible. The management of LULUCF could also include action to increase wider social and environmental benefits.**.

## Endnotes



[i]Defined in terms of the administrative boundary of the York area.

[ii]We base our global carbon budget on the latest IPCC Special Report on 1.5ºC (IPCC SR1.5) findings on how carbon emissions relate to global temperatures. The budget value we have selected provides a ‘likely’ chance of staying below 2°C and offers an outside chance at holding temperatures to 1.5°C. As IPCC SR1.5, notes there are no emissions pathways for limiting warming to 1.5°C that do not rely upon significant carbon dioxide removal technology deployment [2]

[iii]Based on BEIS LA statistics 2017 $CO_2$ emissions York (excluding aviation, shipping, process CO2 emissions from cement production and those from LULUCF).

[iv]This is due to the near-linear relationship between cumulative CO2 emissions and temperature is the result of various feedback processes and logarithmic relationship between atmospheric CO2 concentrations and radiative forcing, as well as the changes in the airborne fraction of CO2 emissions [19].

[v]The 2019 amended UK Climate Change Act commits the UK to at least a 100% reduction in greenhouse gas emissions by 2050 from 1990 levels on the basis that the UK’s ‘carbon account’ is ‘net zero’ by this point. This is not the same as zero greenhouse gas emissions by 2050. In this framing residual greenhouse gas emissions are net zero on the provision that they are balanced by greenhouse gas removals in the UK's carbon account.

[vi]Carbon offsetting refers to the purchase of a tradeable unit, representing emissions rights or emissions reductions, to balance the climate impact of an organisation, activity or individual.

[vii]Based on IEA’s ambitious 2 degree scenario on process $CO_2$ for the period 2020-2050, subsequently extrapolating to zero by 2075

[viii]Grandfathering is based on the average proportion of $CO_2$ emissions from each Party in recent years.

[ix]Balanced approach at current basic prices

[x]After deducting an emissions budget for aviation, shipping and military transport of 1,518 $MtCO_2$

[xi]Based on York's 2016 CO2 emissions (excluding aviation, shipping, process $CO_2$ emissions from cement production and those from LULUCF).

## 5. Reference List


1. United Nations, Paris Agreement, U. Nations, Editor. 2015, United Nations: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.
2. Masson-Delmotte, V., et al., Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change,. 2018, IPCC: https://www.ipcc.ch/sr15/.
3. Anderson, K. and A. Bows, Beyond 'dangerous' climate change: emission scenarios for a new world. Philos Trans A Math Phys Eng Sci, 2011. 369(1934): p. 20-44.
4. Kuriakose, J., et al., Quantifying the implications of the Paris Agreement for Greater Manchester. 2018, Tyndall Centre for Climate Change Research: https://www.research.manchester.ac.uk/portal/en/publications/quantifying-the-implications-of-the-paris-agreement-for-greater-manchester(d2e50584-952e-472b-a2b0-1c7e7d1651e1).html.
5. IPCC, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, R.K. Pachauri and L.A. Meyer, Editors. 2014, IPCC: https://www.ipcc.ch/report/ar5/syr/. p. 151.
6. Davies, E., et al., Quantifying Greenhouse Gas Emissions 2017: https://www.theccc.org.uk/wp-content/uploads/2017/04/Quantifying-Greenhouse-Gas-Emissions-Committee-on-Climate-Change-April-2017.pdf.
7. Government, H., Climate Change Act 2008 (c.27). 2008: http://www.opsi.gov.uk/acts/acts2008/ukpga_20080027_en_1.
8. Belcher S, Boucher O, and Sutton R., Why results from the next generation of climate models matter. 2019, Carbon Brief: https://www.carbonbrief.org/guest-post-why-results-from-the-next-generation-of-climate-models-matter.
9. Fernandez Pales, A. and Leung Y., Technology Roadmap - Low-Carbon Transition in the Cement Industry. 2018, International Energy Agency: https://webstore.iea.org/technology-roadmap-low-carbon-transition-in-the-cement-industry.
10. Anderson K and Broderick J., Natural gas and climate change. 2017: https://www.research.manchester.ac.uk/portal/files/60994617/Natural_Gas_and_Climate_Change_Anderson_Brod
11. Walsh, C., S. Mander, and A. Larkin, Charting a low carbon future for shipping: A UK perspective. Marine Policy, 2017. 82: p. 32-40.
12. BEIS, UK local authority carbon dioxide emissions estimates 2017, E.a.I.S. Department for Business, Editor. 2019, Office of National Statistics: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017.
13. Department for Business Energy and Industrial Strategy, Final UK greenhouse gas emissions national statistics: 1990-2017. 2019: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776085/2017_report.pdf.
14. Department for Business Energy and Industrial Strategy, 2018 UK GREENHOUSE GAS EMISSIONS, PROVISIONAL FIGURES BEIS, Editor. 2019: file:///C:/Users/mbgnhcj2/AppData/Local/Temp/2018-provisional-emissions-statistics-report.pdf.
15. Park, N., United Kingdom population mid-year estimate, O.f.N. Statistics, Editor. 2018, Office for National Statistics: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/timeseries/
16. Nash, A., Population projections for local authorities: Table 2 O.f.N. Statistics, Editor. 2018, Office for National

Statistics: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/
17. Fenton, T., Regional economic activity by gross value added (balanced), UK: 1998 to 2017 O.f.N. Statistics, Editor. 2018, Office for National Statistics: https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedbalanceduk/1998to201
18. Brown, K., et al., Land use: Reducing emissions and preparing for climate change 2018, Committee on Climate Change: https://www.theccc.org.uk/publication/land-use-reducing-emissions-and-preparing-for-climate-change/.
19. IPCC, Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley Editor. 2013: https://www.ipcc.ch/report/ar5/wg1/.

This page is intentionally left blank

**Climate Change Policy and Scrutiny Committee**

**Draft Work Plan 2019-20**

| | |
|---|---|
| Tuesday 10 September @5.30pm | 1. Terms of Reference<br>2. Approach – Ways of Working<br>3. Climate Change Update<br>4. Identifying Priorities<br>5. Work Plan |
| Tuesday 15 October 2019 @5.30pm | 1. Attendance of the Executive Member for Environment and Climate Change<br>2. Round-table discussions on baseline statistics and funding opportunities<br>3. Work Plan |
| Tuesday 12 November 2019 @5.30pm | 1. Co-option to the Climate Change Policy and Scrutiny Committee<br>2. Specialist Perspectives on Challenges and Opportunities of a Zero Carbon Fleet<br>3. One Planet York – Update<br>4. Work Plan |
| Monday 16 December 2019 5.30pm | 1. Refreshing York's Commitment to the Covenant of Mayors<br>2. Scoping Report on Corporate Review of Poverty in York<br>3. Carbon Budgeting<br>4. Work Plan |
| Tuesday 14 January 2020 | 1. Sustainable Housing<br>Round Table Discussion with: |

| | |
|---|---|
| @5.30pm | - Planning<br>- CYC Housing<br>- Private Developers<br>2. Work Plan |
| Tuesday 4 February 2020 @5.30pm | 1. Procurement Theme (TBC)<br>2. Work Plan |
| Tuesday 10 March 2020 @5.30pm | |
| Tuesday 21 April 2020 @5.30pm | |
| Tuesday 12 May 2020 @5.30pm | |