

## Item 5

3rd February 2016



**Glasgow City Council**

**Sustainability and the Environment Policy Development Committee  
3 February 2016**

**Report by Executive Director of Land and Environmental Services**

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### **SUSTAINABLE GLASGOW – ENERGY AND CARBON MASTERPLAN EMISSIONS TARGET UPDATE**

#### **Purpose of Report:**

To provide the Committee with an update on the progress of the Sustainable Glasgow - Energy & Carbon Masterplan 30% emissions target.

#### **Recommendations:**

It is recommended that Committee;

- note the progress being made towards the 2020 emissions reduction target;
- consider further actions necessary to ensure that the 2020 target is met; and
- agree to support further debate on setting ambitions for 2030 and beyond.

Ward No(s):

Citywide: ✓

Local member(s) advised: Yes  No ✓

consulted: Yes  No ✓

## **1. Introduction**

- 1.1 Sustainable Glasgow was established in 2010 and founded on a report commissioned by the Council. This set a target of reducing the city's carbon emissions by 30% by 2020 on a 2006 baseline.
- 1.2 In autumn 2012, Glasgow was successful in its bid for EU funding to deliver the STEP-UP project (Strategies Towards Energy Performance and Urban Planning). The bid was made in partnership with three other European cities (Ghent, Gothenburg & Riga). Each city formed a consortium of local partners, which for Glasgow were Scottish Power Energy Networks and the University of Strathclyde as well as the City Council. The project successfully delivered a methodology for enhancing sustainable energy plans for cities across Europe. Through the STEP-UP project, the 2010 Sustainable Glasgow report was reviewed and enhanced, becoming the Sustainable Glasgow - Energy and Carbon Masterplan (ECM).
- 1.3 The Council's Executive Committee approved the Energy and Carbon Masterplan for the city in April 2015.
- 1.4 The Masterplan retains the commitment to achieve a 30% reduction in Glasgow's carbon emissions on a 2006 baseline and identifies 33 discrete actions that, if delivered, will help the city to achieve its target.
- 1.5 The Energy and Carbon Masterplan has two main submissions: one for Glasgow City Council on an annual basis; another for the Covenant of Mayors, which is due every two years from the resubmission date (February 2014).

## **2. Background**

- 2.1 The Department for Energy and Climate Change (DECC) releases data on energy consumption and carbon emissions for Local Authorities across the UK on an annual basis and two years in arrears. The data available from DECC has been updated from its previous releases. The changes between DECC data released in 2014 and DECC data released in 2015 has a minimal variation of 0.1% for the period 2006-2012.
- 2.2 This report updates the carbon emissions and energy consumption figures for the City of Glasgow based on most recent DECC data.
- 2.3 The legacy of the STEP-UP Project is managed by Land & Environmental Services. This includes compiling data from various stakeholders (private, public, residential, industrial/commercial and transport sectors) and analysing energy consumption and carbon emissions at city wide level.
- 2.4 G-Heat (Glasgow Home Energy Advice Team) is a partnership that was established to provide independent advice on energy related issues to householders in the city on a face to face basis, in their homes, and assist in Glasgow City Council's strategic aim of eliminating Fuel Poverty. The

Affordable Warmth Team within GCC has been looking at insulation for tenement buildings and has been offering loft and cavity wall insulation where suitable. Both initiatives have strived to reduce the carbon emissions within Glasgow and to highlight that this is key policy for Glasgow City Council that aligns with the Council's 2012 – 2017 Strategic Plan.

### 3. Results: Analysis of Energy Consumption and Emissions Data

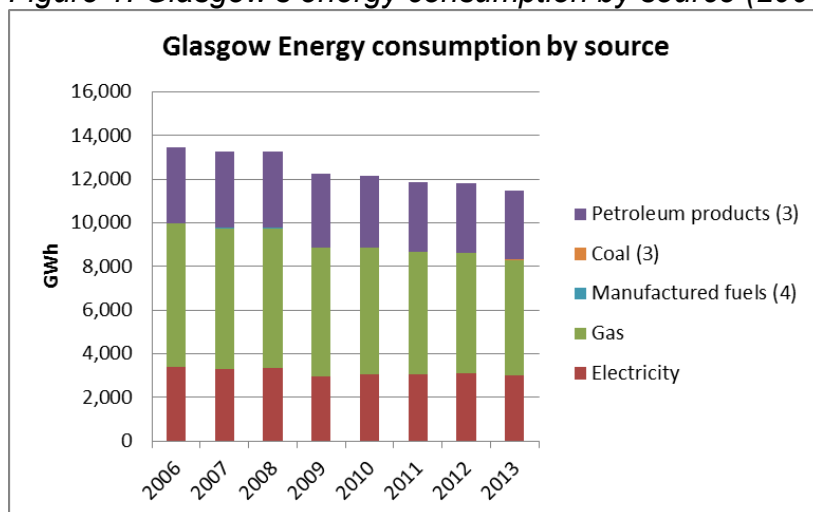
#### 3.1 Glasgow Energy Consumption

3.1.1 The City of Glasgow's total energy consumption in 2013 was 11,480 Giga-Watt hours<sup>1</sup> (GWh), which represents a 2.8% reduction (329 GWh) from 2012. The main sectors contributing to this energy reduction in 2013 were: the domestic sector, which reduced by 120 GWh; and the industrial and commercial sector reduction by 209 GWh; while the transport sector decreased by 0.5 GWh. From analysing the energy sources, the largest reduction in consumption was from gas, reducing by 225 GWh, and the use of petroleum products reducing by 211 GWh, while electricity reduced by 85 GWh.

3.1.2 The results of the energy consumption analysis from 2013 compared to 2012 highlights the need to reduce energy use in the transport sector. Projects to support this objective should therefore be encouraged and members will recall a report on this important area at a previous Committee meeting. The reduction in gas consumption is welcome in terms of CO<sub>2</sub> reduction, however, it does raise the question whether, in the domestic sector, these reductions are the result of high energy costs.

3.1.3 The city's total energy use has declined by 14.8% (1,989 GWh) from the baseline year of 2006 to 2013, as shown in Figure 1. This is attributed primarily to a decrease in gas consumption (1,271 GWh), from which the main reduction is in the domestic sector (733 GWh), followed by the industrial and commercial sector (538 GWh).

*Figure 1: Glasgow's energy consumption by source (2006 – 2013)*

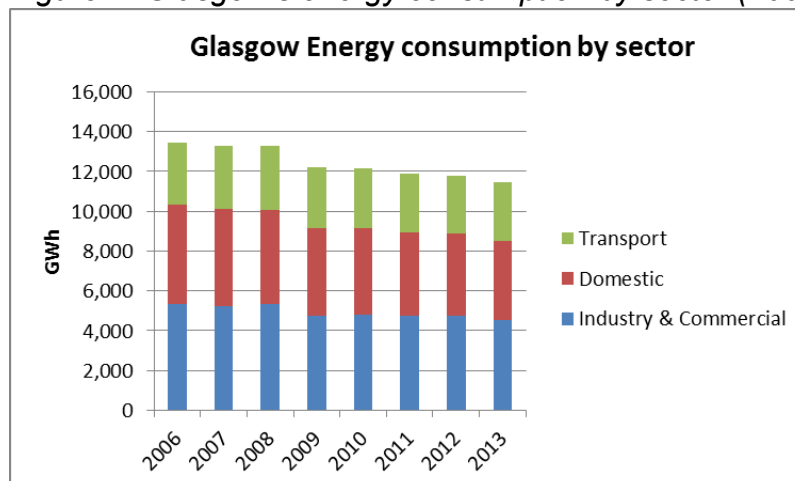


Source: DECC. Total sub-national final energy consumption, 2013. Published on 24/Sept/2015

<sup>1</sup> 1 Giga-Watt hours (GWh) is equal to 1,000 Mega Watt hours or 1,000,000 kilo Watt hours

3.1.4 By analysing the difference in energy consumption from all sources, from 2006 to 2013, it is apparent that the sectors that experienced the biggest reductions were the domestic sector (981GWh) and the industrial and commercial sector (802 GWh). However, despite the reductions, these two sectors are still the highest energy consumers in Glasgow (as seen in Figure 2) and efforts to reduce their energy consumption (which should be directed mainly at electricity consumption due to its carbon intensity) and lower their carbon emissions are critical if the city is to achieve its carbon targets.

Figure 2: Glasgow's energy consumption by sector (2006–2013)

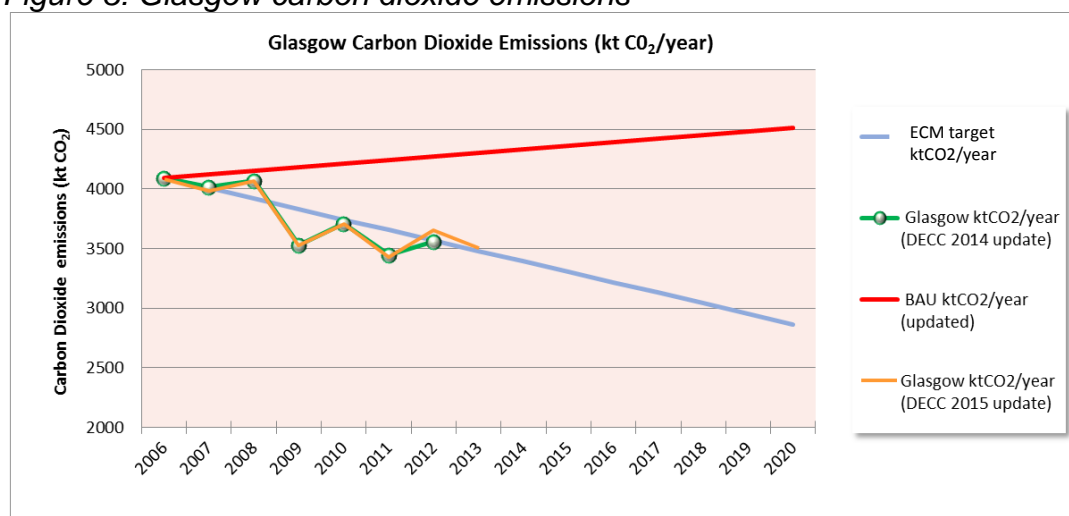


Source: DECC. Total sub-national final energy consumption, 2013. Published on 24/Sept/2015.

### 3.2 Glasgow Carbon Dioxide Emissions

3.2.1 Glasgow's CO<sub>2</sub> emissions in 2013 were 3,504 kilo-tonnes<sup>2</sup> of carbon dioxide (ktCO<sub>2</sub>). This represents a 4% decrease from 2012. The main sectors contributing to this reduction were: the industrial and commercial sector (97ktCO<sub>2</sub>); the domestic sector (46 ktCO<sub>2</sub>); while the transport sector demonstrated the smallest reduction (6 ktCO<sub>2</sub>). The majority of carbon savings by energy source were seen in electricity (165 ktCO<sub>2</sub>) when compared with 2012.

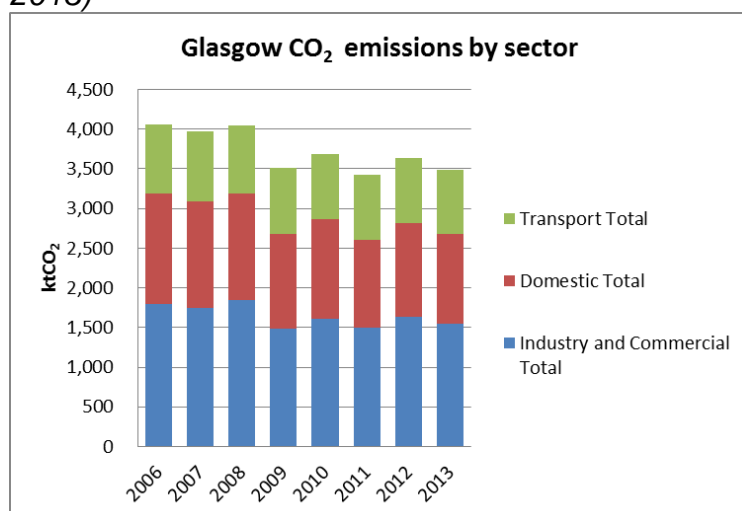
Figure 3: Glasgow carbon dioxide emissions



<sup>2</sup> 1 kilotonne (kt) is equal to 1,000 tonnes

- 3.2.2 The overall target for Glasgow is to reduce 1,223 ktCO<sub>2</sub> by 2020, from the baseline year (2006). Comparing the carbon dioxide emissions in 2013 against 2006 reveals Glasgow has reduced its emissions by 574 ktCO<sub>2</sub>. This equates to a 14% reduction in total emissions indicating that the city is progressing towards a 30% reduction (as shown in Figure 3).
- 3.2.3 However, Glasgow still faces a challenge to reduce the remaining 650 ktCO<sub>2</sub> by 2020. This is the equivalent of a minimum annual reduction of a further 93 ktCO<sub>2</sub> each year or, in percentage terms, a continuing annual reduction of 3%.
- 3.2.4 The sectors producing the most carbon emissions in 2013 were: the industrial and commercial sector with 1,541ktCO<sub>2</sub>/year and the domestic sector with 1,136ktCO<sub>2</sub>/year. This trend is similar to previous years as seen in Figure 4.

Figure 4: Breakdown of Glasgow's carbon dioxide emissions by sector (2006 - 2013)



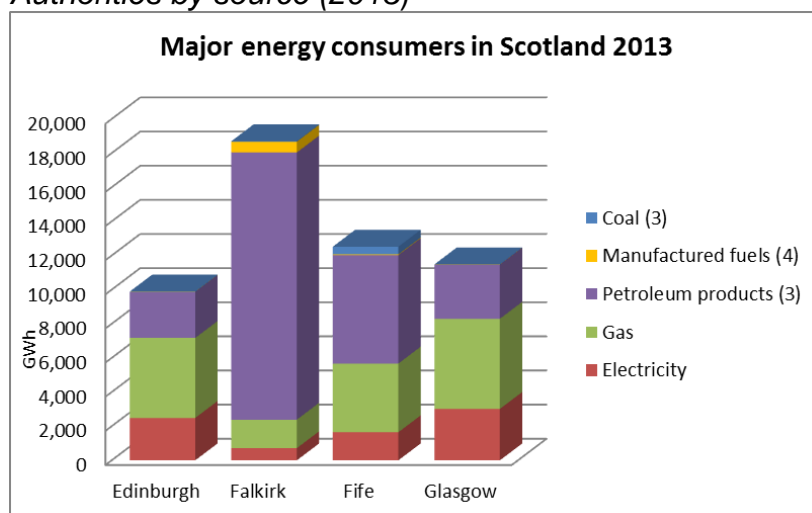
Source: DECC. Local CO<sub>2</sub> emission estimates 2005-2013. Published 25/Jun/2015

- 3.2.5 The sector achieving the biggest carbon reductions from 2006 to 2013 is the domestic sector, with reductions of 257 ktCO<sub>2</sub>, followed by 252 ktCO<sub>2</sub> from the industrial and commercial sector. The sector with the least carbon reductions is the transport sector with 58 ktCO<sub>2</sub>. This illustrates the need for increased effort in identifying and implementing carbon saving actions in the transport sector.
- 3.2.6 The picture which emerges from the combination of the carbon emissions section above and the energy consumption section shows that, if the city wants to accomplish its CO<sub>2</sub> target by 2020, then continued action is required in reducing energy consumption in the three main sectors. Efforts should be focused mainly in reducing or replacing electricity consumption and petroleum products for lower carbon sources. Continued support for the development of renewable energy projects and other low carbon projects will facilitate a secure energy future for Glasgow and its citizens, and will contribute to successfully achieving the carbon targets on time.

### 3.3 Glasgow and other Local Authorities in Scotland

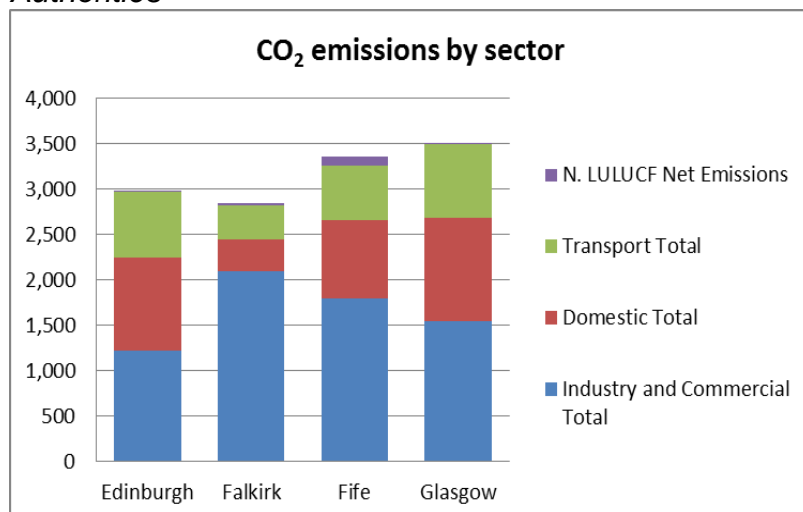
3.3.1 Analysis of the energy consumption of all 32 Scottish Local Authority areas in 2013 shows that Falkirk was the biggest consumer of energy (18,709 GWh), followed by Fife (12,557 GWh), Glasgow (11,480GWh) and Edinburgh (9,889 GWh), as shown in Figure 5. The main contribution to Falkirk's higher consumption is its use of petroleum products (over 14,000GWh), which is seven times more than Glasgow's use. However, the gas and electricity consumption in Glasgow is around three times higher than Falkirk.

*Figure 5: Breakdown of energy consumed by top four Scottish Local Authorities by source (2013)*



3.3.2 Analysis of the CO<sub>2</sub> emissions by Scottish Local Authority areas in 2013 shows that the major emitters are the same four Local Authorities: Fife, Glasgow, Edinburgh and Falkirk (as indicated in Figure 6). Due to the carbon intensity of electricity and the low level of electricity consumption combined with minimum CO<sub>2</sub> emissions in the domestic sector by Falkirk, it dropped to 4<sup>th</sup> place.

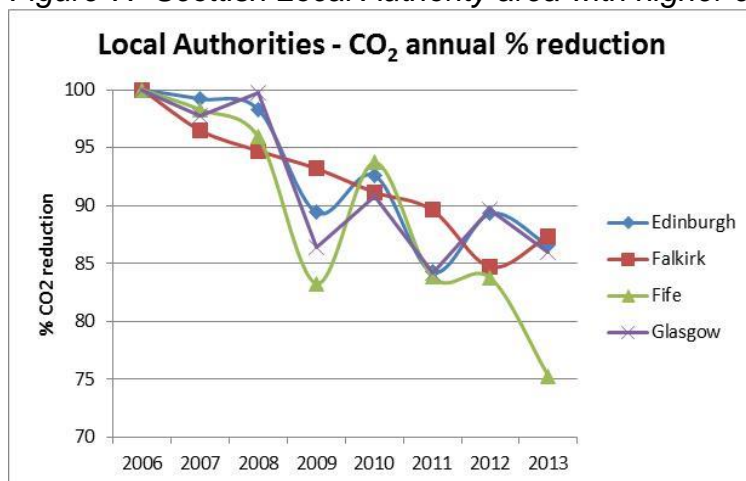
*Figure 6: Breakdown of carbon dioxide emissions by top four Scottish Local Authorities*



3.3.3 Examination of the CO<sub>2</sub> per capita shows that Glasgow's was 5.6 in 2013. This is lower than Scotland's average CO<sub>2</sub> per capita (6.6), which is a positive indicator, it could also reflect that there is an increase of people living in pockets of fuel poverty in the city.

3.3.4 Comparing 2013 and 2006, Glasgow has made a significant energy reduction (14.8%), outperforming both Falkirk (12.6% reduction) and Edinburgh (13.4%), as shown in Figure 7.

Figure 7: Scottish Local Authority area with higher carbon dioxide production



3.3.5 DECC's dataset show all Scottish Local Authority areas are achieving reductions in CO<sub>2</sub> emissions. Continued efforts by Glasgow to reduce its CO<sub>2</sub> emissions will provide significant support to meeting national CO<sub>2</sub> targets as well as delivering benefits to the city.

## 4. Projects

4.1 The Energy and Carbon Masterplan (ECM) outlines 33 key actions which aim to reduce carbon emissions in the three main sectors (transport, domestic, and industrial/commercial sectors) and ensure that the City of Glasgow can continue to successfully reduce CO<sub>2</sub> emissions by 2020.

4.2 Successful delivery of these 33 key actions requires the support and collaboration of public sector, private sector, community groups and citizens, especially those involved in the industrial, commercial and transport sector, due to the Council's limited influence on these sectors.

4.3 Land & Environmental Services is responsible for monitoring these key actions on an annual basis and for identifying further opportunities, especially through renewable energy projects.

4.4 The significant projects in the ECM include:

- Increase of renewable energy production in the city e.g. through wind turbines and solar PV panel arrays. Work has been completed installing

solar arrays on eight schools and further opportunities are being explored. Further installations on Council buildings and car park roofs are undergoing feasibility studies. The large wind turbine on Cathkin Braes continues to generate renewable energy of approximately 8,000MW per annum. Further wind turbine installations have been identified and business models for their development are being explored. The installation of a small-scale hydro scheme in Pollok Park is due to be completed by June 2016, with more opportunities for similar projects identified.

- Expansion of District Heating networks across the city including the Athletes' Village and new Glasgow University campus.
- Increase of sustainable transport modes (such as shifting from private cars to car-share, public transport, cycling, walking). Glasgow's Cycling App and the MACH bikes have been instrumental in an exponential growth in cycling in the city.
- De-carbonisation of the transport sector (through electric buses and other electric vehicles). The charging infrastructure for electric vehicles continues to grow in Glasgow and more electric vehicles are being used in the city. Two electric buses are being used on the 100 service (city centre to the Riverside Museum).
- Generation of energy from waste (the GRREC project). The GRREC is expected to start generating in 2016. Monitoring the operational performance of the GRREC in its first year will inform the strategy as it moves forward.
- Behavioural change. Work continues on the development of the City Model, which is an engagement tool aimed at changing behaviour and informing energy planning, with efforts concentrated on improving the user interface to broaden the tool's influence.

4.5 To build upon the city's commitment, it is important that stakeholders from the different sectors, such as the transport sector (public transport, private transport); residential sector (private and social housing); commercial and industrial sector work with the Council to make their activities more sustainable and to use energy and resources more efficiently.

4.6 DECC publishes energy and carbon emissions data two years in arrears, due to the complexity of collating data from different sectors and sources that consume energy and emit carbon emissions. This limits local ability to present current information on energy and carbon performance at a city level. Therefore in 2020 the most up to date information will correspond to the year 2018. Results for the target year of 2020 will not be known until 2022. Sustainable Glasgow is working with partners in the city to identify a method of accelerating data collection. According to the forecasts in relation to a 3% annual reduction, in 2018 the emissions figures for the city should aim to be under 3,040ktCO<sub>2</sub>.

## 5. Conclusions

- 5.1 This report provides a detailed assessment of how the city currently stands in relation to its carbon dioxide emissions and reduction targets. The overall trend is positive, although affording no room for complacency in addressing the challenge of the 2020 targets. As debate moves on from the COP21 (Conference of the Parties) discussions in Paris, however, a further focus will be put on setting ambitious targets for the years beyond 2020.
- 5.2 In considering the above, the Leader of the Council has recently agreed to join other cities around the UK and the world in signing up to a pledge which commits Glasgow to a 100% clean energy supply by 2050. This sets the goal towards which the city needs to travel and therefore adds further weight to consideration of interim targets for 2030 and 2040 in relation to de-carbonising both energy and other causes of greenhouse gas emissions. Further discussion will therefore take place with partners to look at setting further ambitious targets for Glasgow, which will include the potential for organisations in the city themselves to move towards a carbon-neutrality in their operations.

## 6. Council Strategic Plan Implications

### Resource Implications:

*Financial:* Delivery of some of the actions will require investment by the council. Business cases will be presented where investment is required.

*Legal:* Legal will be consulted as necessary however, no immediate impact expected.

*Personnel:* All work will use existing staff based in LES, supported, as necessary, by officers in other Services.

*Procurement:* None

**Council Strategic Plan:** These projects support the following Strategic Plan objectives:

- Economic growth;
- A vibrant city;
- A sustainable city;

### Equality Impacts:

*EQIA carried out:* Screening undertaken

Outcome No further action required.

**Sustainability Impacts:**

*Environmental:* The successful delivery of the 33 actions will contribute to meeting the target of 30% reduction in CO<sub>2</sub> emissions in Glasgow by 2020.

*Social:* The actions within the Masterplan could provide decentralised energy to communities in the city thus aiding with providing affordable warmth and secure, low carbon energy.

*Economic:* These projects could contribute to developing the low carbon economy of Glasgow and could contribute to enhancing Glasgow's reputation as a sustainable city.

**7. Recommendations**

It is recommended that Committee;

- note the progress being made towards the 2020 emissions reduction target;
- consider further actions necessary to ensure that the 2020 target is met; and
- agree to support further debate on setting ambitions for 2030 and beyond.