Item 4

19th March 2019

Glasgow City Council

Environment Sustainability & Carbon Reduction City Policy Committee

Report by Executive Director of Neighbourhoods and Sustainability

Contact: Gavin Slater Ext: 78347

UPDATE ON CITY WIDE ENERGY CONSUMPTION AND CARBON EMISSIONS

Purpose of Report:

The purpose of the report is to:

(a) Provide Committee with an update on energy consumption and carbon emissions in Glasgow since the baseline year of 2006.
(b) To analyse the city's progress towards the 30% carbon dioxide (CO_2) reduction by 2020 target, which informs the annual monitoring to the Energy and Carbon Master Plan and reporting to the European Covenant of Mayors office.

Recommendations:

The Committee is asked to –

(a) Note the contents of this Report;
(b) Continue to support the work of Neighbourhoods & Sustainability (NS) in reducing Glasgow's CO_2 emissions and environmental impact, including the associated financial burden.
(c) Request a further update on the city progress towards the 30% carbon dioxide target in 12 months.

Ward No(s):	Citywide:
Local member(s) advised: Yes ☐ No ☐	consulted: Yes ☐ No ☐

1. Introduction

1.1 In 2010, the Council established Sustainable Glasgow, a partnership that, based on the Sustainable Glasgow Report commissioned by the Council, set out a target of reducing the city's carbon emissions by 30% by 2020 in a 2006 baseline.

1.2 In Autumn 2012, Glasgow, in partnership with three other European Cities (Ghent, Gothenburg & Riga) committed to delivering the EU funded STEP UP (Strategies Towards Energy Performance and Urban Planning) project, which successfully delivered a methodology for enhancing sustainable energy plans for cities across Europe. Through the Step-Up project, the 2010 Sustainable Glasgow Report was enhanced and became the Sustainable Glasgow - Energy and Carbon Masterplan (ECM).

1.3 The Executive Committee (now City Administration Committee) approved the Council's Energy and Carbon Masterplan for the City in April 2015 (see undernoted link).

https://www.glasgow.gov.uk/councillorsandcommittees/submissiondocuments.asp?submissionid=74199

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, would help the City achieve its target. Contained within the 33 actions are actions pertaining to the development of renewable energy generation assets.

1.5 The Energy and Carbon Masterplan has two main submissions –

(a) Glasgow City Council's on an annual basis;
(b) the Covenant of Mayors, due every two years from the resubmission date (February 2014).

2 Background

2.1 The Department for Business, Energy, & Industrial Strategy (BEIS), formerly the Department for Energy and Climate Change (DECC), releases data on energy consumption and carbon emissions for local authorities annually two years in arrears. The data available from BEIS has been updated from its previous releases.

2.2 The information used in the ECM (and previous STEP UP project documents) is based on 2014 DECC datasets. This report updates the carbon emissions and energy consumption figures for Glasgow based on most recent BEIS data.

2.3 The legacy of the STEP UP Project is managed by NS. This includes compiling data from various stakeholders (private, public, residential,

industrial/commercial and transport sectors) and analysing the energy consumption and carbon emissions at city wide level.

3. Results: Analysis of energy consumption and emissions data

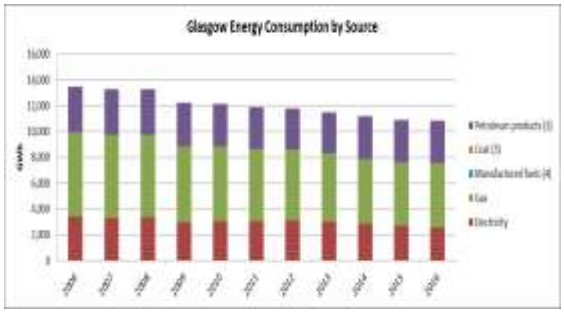
3.1 Glasgow Energy Consumption

3.1.1 Glasgow's total energy consumption in 2015 was 10,928 Giga-Watt hours[1] (GWh) which represents a 0.4% reduction (24.9 GWh) from 2014. This appears to represent a fairly static picture with regards to consumption in the city however, the domestic sector did show a reduction in consumption of 39 GWh. In contrast, the industrial and commercial, and transport sectors both showed slight increases in consumption (by 10 GWh and 2 GWh respectively). By analysing the consumption by energy sources, the largest reduction in consumption was from electricity, reducing by 116 GWh. Use of petroleum products in the industrial and commercial sector increased by 48 GWh, whilst gas consumption increased in both the industrial and commercial, and domestic sectors, by 38 GWh in total.

3.1.2 On average, 2016 was a warmer year than 2015, making it difficult to attribute the increase in gas consumption to space heating. The domestic increase could, in some part, be related to the city having increased its populace by roughly 9,000 people in 2016. The increase in industrial and commercial emissions could be a result of improved economic performance.

3.1.3 The city's total energy use has declined by 19% (2,541 GWh) from baseline year (2006) to 2016 as per shown in Figure 1. This is attributed primarily to a decrease in gas consumption (1,577 GWh), from which the main reduction is in the domestic sector (825 GWh), followed by the industrial and commercial sector (752 GWh).

Figure 1. Glasgow's energy consumption by source (2006 – 2015)

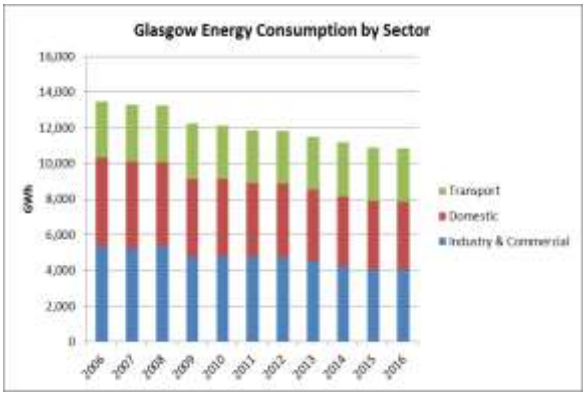


[1] 1 Giga-Watt hours (GWh) is equal to 1,000 Mega Watt hours or 1,000.000 kilo Watt hours

Source: BEIS. 2018 sub-national final energy consumption statistics.

3.1.4 By analysing the difference in energy consumption from 2006 to 2016, it is apparent that the sectors that experienced the biggest reductions were the industrial and commercial sector (1,322GWh) and the domestic sector (1,141 GWh), a reversal of 2013 when the domestic sector showed the biggest overall reduction. However, despite these overall reductions, these two sectors continue to be the highest energy consumers in Glasgow (Figure 2) and efforts to reduce their energy consumption should be maintained. Previous reports have pushed for most effort to be directed at reducing electricity however, due to the decarbonisation of the electricity grid, and the fact that most energy is used in heating, increased effort should be concentrated on reducing gas consumption.

Figure 2. Glasgow's energy consumption by sector (2006–2016)



Source: BEIS. 2018 sub-national final energy consumption statistics for 2015.

3.2 Glasgow Carbon Dioxide Emissions

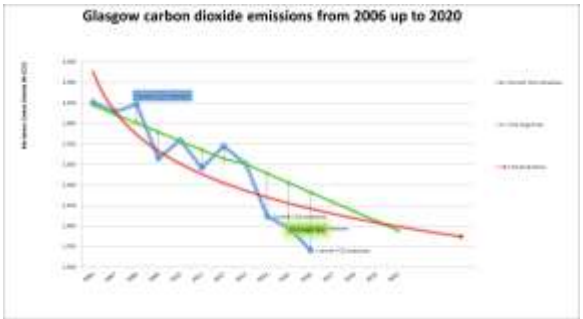
3.2.1 Glasgow's CO_2 emissions in 2016 totalled 2,660 kilo-tonnes[2] of carbon dioxide ($ktCO_2$). This represents an 8% decrease from 2015 and a **35%** decrease from baseline, meaning that having met our target in 2015, **Glasgow has continued to exceed its 2020 target of 30% ahead of schedule.** This is a significant achievement, and testament to what the city can achieve with regards to its ambition of becoming one of the most sustainable cities in Europe. Despite this success, it is imperative that efforts to reduce carbon emissions do not falter, and that this success serves to motivate continued efforts to exceed the 2020 target by as much as possible.

3.2.2 The main sectors contributing to this reduction were: the industrial and commercial sector (169 $ktCO_2$ from 2015 – 2016 and 834 $ktCO_2$ from 2006 – 2016); and the domestic sector (69 $ktCO_2$ from 2015 – 2016 and 553 $ktCO_2$ from 2006 – 2016); while the transport sector demonstrated an increase from 2015 – 2016 of 19 $ktCO_2$ but an overall decrease of 53 $ktCO_2$. It is clear that the overall decrease in both industrial and commercial, and domestic emissions is on track, transport related issues still present a challenge. It is

[2] 1 kilotonne (kt) is equal to 1,000 tonnes

important to note that these emissions statistics do not represent progress made to date on electric vehicles and the low emission zone, which should have a positive impact.

Figure 3. Glasgow carbon dioxide emissions



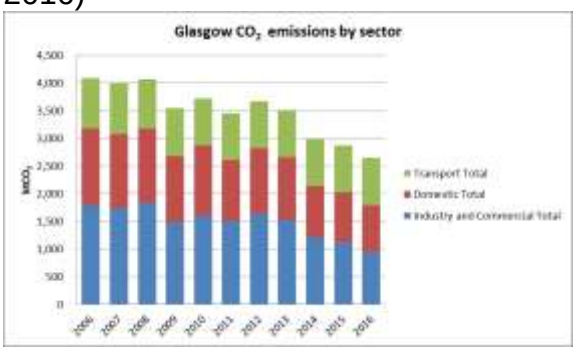
Source: BEIS. Local CO_2 emission estimates 2005-2016.

3.2.3 The overall target for Glasgow is to reduce emissions by 1,237 $ktCO_2$ by 2020, from the baseline year (2006). Comparing the carbon dioxide emissions in 2016 against 2006 reveals Glasgow has reduced its emissions by 1,448 $ktCO_2$. This equates to a 35% reduction in total emissions indicating that the city has continued to reduce emissions ahead of target, following on the results of 2015 (Figure 3) although, as previously stated in this report, this is the result of local and national efforts.

3.2.4 The red line in figure 3 shows the trend line for CO_2 emissions based on the actual data recorded up to 2016. If efforts to reduce CO_2 were to slacken, and business were to follow a business-as-usual approach, emissions should be expected to rise again and the city would fall behind target. To ensure success by 2020, and beyond, it is crucial that efforts to continue to reduce CO_2 emissions continue to be supported by Glasgow City Council.

3.2.5 The sectors responsible for emitting the most CO_2 in 2015 were: the industrial and commercial sector by 962 $ktCO_2$/year and the transport sector by 859 $ktCO_2$/year. This is the first time since Glasgow set its 30% target in 2010 that the domestic sector has emitted less CO_2 than the transport sector. While this is a laudable success for the domestic sector, it also illustrates the lack of significant progress in emissions related to the transport sector. 2016 is also the first year that emissions from the transport sector have increased since 2008 as seen in Figure 4.

Figure 4. Breakdown of Glasgow's carbon dioxide emissions by sector (2006 - 2016)



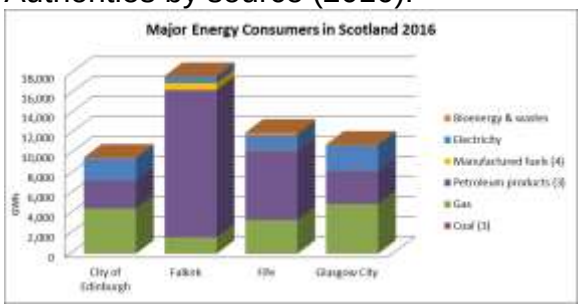
Source: BEIS. Local CO_2 emission estimates 2005-2016.

3.2.6 Combining the outcomes from the carbon emissions section (section 3.2.5) and the energy consumption section (section 3.1.4), highlights that, even though the city has, in 2016, exceeded its 2020 CO_2 target, continued action is required in reducing energy consumption in the three main sectors. Efforts should be focussed mainly on reducing heat demand in buildings in Glasgow, both from gas and electricity, as well as concentrating efforts on reducing emissions from transport. 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 & exceeding the carbon targets by 2020.

3.3 Glasgow and other Local Authorities in Scotland

3.3.1 Analysis of the energy consumption of all the Scottish Local Authorities (LA's) in 2014, shows that Falkirk continues to be the biggest consumer of energy (17,801 GWh), followed by Fife (12,124 GWh), Glasgow (10,928 GWh) and Edinburgh (9,632 GWh) as per indicated in Figure 5. Of the four largest consumers, Falkirk is the only to show an overall increase in energy consumption from 2015.

Figure 5. Breakdown of energy consumed by top four Scottish Local Authorities by source (2016).



Source: BEIS. Local CO_2 emission estimates 2005-2016.

3.3.2 Examination of the CO_2 per capita shows that Glasgow's was 4.3 in 2016 compared to 4.7 in 2015, this is lower than Scotland's average CO_2 per capita (6.6), this is a positive indicator, however it could also reflect that there is an increase of people living in pockets of fuel poverty in the city who cannot afford switching on electricity or gas appliances.

4 Projects

4.1 The Energy and Carbon Masterplan (ECM) has outlined 33 Key Actions aiming to reduce carbon emissions in the three main sectors (transport, domestic, and industrial/commercial sectors) and ensure Glasgow can continue to successfully reduce CO_2 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, particularly those involved in the industrial, commercial and transport sector, due to the Council's limited influence on these sectors.

4.3 NS is responsible for monitoring these Key Actions on an annual basis and identifying further opportunities, especially through renewable energy projects.

4.4 The essential projects in the ECM include:

- Increase of renewable energy production in the city (wind turbines project; solar PV panel arrays);
- District Heating networks;
    - It should be noted that there still remains a serious issue with regards to the application of non-domestic rates on district heating networks. Currently district heating is not classified in the rates system as a utility and is valued based on its construction cost. This results in district heating networks, especially in low density areas, attracting high rates costs, thus diminishing their competitiveness against conventional utilities. This matter has been taken up with the Scottish Government on a number of occasions. Officers from the Council will continue to lobby for a change to how the rates system categorises district heating.
- Increase of sustainable transport modes (i.e. shifting from private cars to car-share, public transport, cycling, walking);
- Decarbonisation the transport sector (electric buses, electric vehicles, etc.);
- Generation of energy from waste (GRREC project);
- Behavioural change.

4.5 In addition to the projects mentioned in the Energy & Carbon Masterplan, further efforts are being made to successfully deliver large-scale projects. In 2015, the city was successful in a bid for EU Horizon 2020 funding for the RUGGEDISED (Rotterdam, Umea, Glasgow: Generating Exemplar Demonstrations in Sustainable Energy Districts), which will enhance energy security, deployment of renewables and electric vehicles, district heating, and energy storage in a city district extending from George Square to the for Meat Market site on Duke Street. This will act as a demonstrator and catalyst for further low carbon districts in the city. The project is now into its 3rd year, when the physical interventions will be deployed and the project will become a visible beacon of sustainability in the city.

4.6 In parallel with the above projects, ongoing and emerging projects, such as the Intelligent Street Lighting and Low Emission Zone, will make sizeable contributions to CO_2 emissions reductions as well as providing enabling infrastructure for expanding existing innovations, such as smart sensors and electric vehicle penetration in the city.

4.7 Projects designed with primary goals other than CO_2 reduction will also make significant contributions to reducing CO_2 emissions in the city, such as the increased use of data and smart systems to manage council assets and

performance and their performance, as illustrated by the developing data based decision platform being delivered through the RUGGEDISED project.

4.8 To build upon the commitment of the council, 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. The Sustainable Glasgow partnership remains a viable method of marshalling these stakeholders and motivating change as we approach 2020 and beyond.

5. Policy and Resource Implications

Resource Implications:

Financial: There are no new financial implications arising from the report.

Legal: The report raises no new legal issues.

Personnel: The staff managing the Energy and Carbon Masterplan for Glasgow is City Energy Team.

Procurement: No relevant procurement issues.

Council Strategic Plan: The report supports the following strategic themes and outcomes:

A Thriving Economy

Outcomes are;

- A resilient, growing and diverse city economy where businesses thrive.
- Glasgow is rated highly for its business innovation and digital skills.

A Vibrant City

Outcomes are;

- Glaswegians are active and healthier.

A Sustainable and Low Carbon City (Priority number 67).

Outcomes are;

- The city is clean and public spaces are well maintained.
- We have a low carbon footprint as a council and as a city.
- We have more sustainable, integrated

transport networks across the city and less congestion
- Citizens use active travel including walking and cycling.

Equality and Socio-Economic Impacts:	
Does the proposal support the Council's Equality Outcomes 2017-22	Yes
What are the potential equality impacts as a result of this report?	An EQIA screening was undertaken and can be viewed via the following link: https://www.glasgow.gov.uk/CHttpHandler.ashx?id=44577&p=0. The screening noted that, as this report details statistics from two years ago, and illustrates reductions in CO_2 emissions in the city that are beneficial to citizens of all genders, races, religions, and physical abilities, a full EQIA was not required.
Please highlight if the policy proposal will help address socio economic disadvantage	The reduction in carbon emissions is strongly linked to the deployment of technologies that aim to generate less environmentally harmful and more affordable energy in areas where socio-economic disadvantage is high, thus providing support to those experiencing socio-economic disadvantage.
Sustainability Impacts:	
Environmental:	This report describes the cumulative reductions in carbon emissions and energy consumption.
Social, including Article 19 opportunities:	This report details the success of actions undertaken by local communities in reducing carbon emissions and energy consumption.
Economic:	This report details the success of actions undertaken by local business & communities in reducing carbon emissions and energy consumption.
Privacy and Data Protection impacts:	This report presents analysis of publically available data and does not represent any privacy or data protection issues thus a Data Protection Impact Assessment (DPIA) has not been carried out.

6. Recommendations

The Committee is asked to

(a) Note the contents of this Report.

(b) Continue to support the work of NS in reducing Glasgow's CO_2 emissions and environmental impact, including the associated financial burden.

(c) Request a further update on the city progress towards the 30% carbon dioxide target in 12 months.