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MANCHESTER CITY COUNCIL

Environment and Climate Change Scrutiny Committee

Date: Thursday, 13 January 2022
Time: 10.00 am
Venue: Council Chamber, Level 2, Town Hall Extension

Everyone is welcome to attend this committee meeting.

There will be a private meeting for Members of the Committee at 9.30 am, 13 January 2022 in the Council Antechamber.

Access to the Public Gallery

Access to the Public Gallery is on Level 3 of the Town Hall Extension, using the lift or stairs in the lobby of the Mount Street entrance to the Extension. **There is no public access from any other entrance.**

Filming and broadcast of the meeting

Meetings of the Environment and Climate Change Scrutiny Committee are 'webcast'. These meetings are filmed and broadcast live on the Internet. If you attend this meeting you should be aware that you might be filmed and included in that transmission.

Membership of the Environment and Climate Change Scrutiny Committee

Councillors - Chohan, Flanagan, Foley, Hassan, Holt, Hughes, Igbon (Chair), Jeavons, Lynch, Lyons, Razaq, Sheikh, Shilton Godwin and Wright

Agenda

1. Urgent Business
To consider any items which the Chair has agreed to have submitted as urgent.

2. Appeals
To consider any appeals from the public against refusal to allow inspection of background documents and/or the inclusion of items in the confidential part of the agenda.

3. Interests
To allow Members an opportunity to declare any personal, prejudicial or disclosable pecuniary interest they might have in any items which appear on this agenda; and [b] record any items from which they are precluded from voting as a result of Council Tax/Council rent arrears. Members with a personal interest should declare that interest at the start of the item under consideration. If members also have a prejudicial or disclosable pecuniary interest they must withdraw from the meeting during the consideration of the item.

4. Minutes Pages 5 - 12
To approve as a correct record the minutes of the meeting held on 9 December 2021.

5. Manchester Food Board Pages 13 - 24
Report of the Consultant in Public Health Manchester Health and Care Commissioning

This report outlines the strategic aims and objective of the Manchester Food Board (MFB) in influencing and addressing climate change, including an overview of the MFB Action Plan, updates on recent action, and priorities for 2022.

6. Climate Change Action Plan - Quarterly Update Report Pages 25 - 42
Report of the Deputy Chief Executive and City Treasurer

The Council declared a Climate Emergency in July 2019 and developed a Climate Change Action Plan (CCAP) 2020-25, which was approved by Executive in March 2020.

This report provides an update on progress in Quarter 3 2021-22 (October – December 2021)

7. Large Scale Renewable Energy Generation Outline Business Case Pages 43 - 146
Report of the Deputy Chief Executive and City Treasurer

The purpose of this report is to seek a decision to support the

proposal to secure delegation from Executive for the Council to enter commercial negotiations to progress the purchase of a suitable solution with options being a solar asset and / or a Power Purchase Agreement (PPA).

8. Overview Report Pages

Report of the Governance and Scrutiny Support Unit 147 - 156

This is a monthly report, which includes the recommendations monitor, relevant key decisions, the Committee's work programme and any items for information.

Information about the Committee

Scrutiny Committees represent the interests of local people about important issues that affect them. They look at how the decisions, policies and services of the Council and other key public agencies impact on the city and its residents. Scrutiny Committees do not take decisions but can make recommendations to decision-makers about how they are delivering the Manchester Strategy, an agreed vision for a better Manchester that is shared by public agencies across the city.

The Environment and Climate Change Scrutiny Committee areas of interest include The Climate Change Strategy, Waste, Carbon Emissions, Neighbourhood Working, Flood Management, Planning policy and related enforcement and Parks and Green Spaces.

The Council wants to consult people as fully as possible before making decisions that affect them. Members of the public do not have a right to speak at meetings but may do so if invited by the Chair. If you have a special interest in an item on the agenda and want to speak, tell the Committee Officer, who will pass on your request to the Chair. Groups of people will usually be asked to nominate a spokesperson. The Council wants its meetings to be as open as possible but occasionally there will be some confidential business. Brief reasons for confidentiality will be shown on the agenda sheet.

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Smoking is not allowed in Council buildings.

Joanne Roney OBE
Chief Executive
Level 3, Town Hall Extension,
Albert Square,
Manchester, M60 2LA

Further Information

For help, advice and information about this meeting please contact the Committee Officer:

Lee Walker, Scrutiny Support Officer
Tel: 0161 234 3376
Email: lee.walker@manchester.gov.uk

This agenda was issued on **Wednesday 5 January 2022** by the Governance and Scrutiny Support Unit, Manchester City Council, Level 2, Town Hall Extension, Manchester M60 2LA

Environment and Climate Change Scrutiny Committee

Minutes of the meeting held on 9 December 2021

Present:
Councillor Igbon – in the Chair
Councillors Flanagan, Foley, Hassan, Holt, Hughes, Jeavons, Lynch, Lyons, Razaq, Sheikh, Shilton Godwin and Wright

Apologies: Councillor Chohan

Also present:
Councillor Rawlins, Executive Member for Environment
Councillor Nunney, Ward Member for Woodhouse Park
Neil Robinson, Group Corporate Social Responsibility & Future Airspace Director Manchester Airports Group
Katie Rice, Public Affairs Officer, Manchester Airports Group
Andy Clarke, Head of Public Affairs, Manchester Airports Group
Richard Elliott, Interim Policy and Strategy Advisor, Manchester Climate Change Agency

ECCSC/21/32 Minutes

A Member noted that the information previously requested in relation to those businesses and organisations that were not formally engaged with the Climate Change Agency had been circulated with the offer of a further meeting with the Agency to discuss the content further if required. A Member requested that this meeting be convened with the date and time circulated to all Members of the Committee.

Decision

To approve the minutes of the meeting held on 11 November 2021 as a correct record, noting the above request.

ECCSC/21/33 Aviation and Carbon Emissions

The Committee considered the report of the Manchester Climate Change Agency and Manchester Airports Group (MAG) that provided an overview of the relationship between aviation and the city's carbon emissions. It set out how, as previously agreed, aviation related emissions needed to form part of a nationally agreed carbon budget for aviation, which should be compatible with the Paris Agreement, rather than being accounted for directly in the city's own discreet carbon budget. The report contained information on the work that Manchester Airport had been doing to reduce the ground-based carbon impact of their activities and the work that Manchester Airport Group were involved with to ensure that the aviation sector played its part in working to reduce its carbon impact.

The report was accompanied by a presentation that summarised the key points within the report.

Key points and themes in the report included:

- Providing an introduction and background, including a description of the economic benefits of the airport;
- Recognising that the airport and aviation did make a contribution to carbon emissions;
- Recognising the importance that both ground emissions and emissions from aviation were considered in the overall strategy to limit overall carbon emissions;
- The Manchester Climate Change Framework included a specific sub-objective for aviation which would be updated in the Framework refresh;
- An overview of the Manchester Airports Group, including information on their Corporate Social Responsibility;
- Information in relation to carbon reporting;
- Information in relation to carbon neutral airports and those activities to address indirect emissions; and
- An update on the work of the Sustainable Aviation Coalition to address aircraft emissions and the Sustainable Aviation Decarbonisation Road-Map.

Some of the key points that arose from the Committee's discussions were: -

- Supporting a call for a frequent flyer tax to be levied;
- Calling upon MAG to exercise its influence both nationally and internationally to address the emissions caused by the aviation industry;
- Any land used for the development and delivery of Sustainable Aviation Fuel should not be at the expense of land that could be used for food production;
- Alternative methods of travel should be promoted by MAG, especially in relation to internal flights;
- More investment was required in sustainable transport to access the airport site rather than rely on car parks, adding that a stop to car park expansion at the site would provide a significant message of intention to address emissions;
- Consideration should be given to adopting an alternative carbon calculation method as recommended by the Tyndall Centre;
- Who established the carbon budget for the airport and how was this arrived at;
- What was MAG doing to attract and adopt green skills and jobs at the airport;
- The need to review the Manchester City Council Staff Travel Policy and the policy that was applied to Executive Members to ensure that it was consistent and not contrary to the Climate Emergency;
- The call to minimise or stop aircraft engines revving when on the airfields with consideration to be given to electric ground vehicles manoeuvring aircraft into their holding position ahead of take off;
- Noting that aircraft engines emitted carbon and harmful particulates that could have an adverse effect on a person's health;
- Consideration needed to be given to free parking for electric vehicles and the installation of electric vehicle charging point to be installed at the airport;
- The Government should be lobbied to support and finance electric vehicles that don't access the highways but were used to service major infrastructure sites, such as airports and ports;
- Requesting that the views of the Committee were relayed to the Aviation Sub Group established by the Climate Change Partnership; and

- Members would welcome the opportunity to understand the options being discussed by the Aviation Sub Group.

The Committee heard from Councillor Nunney, Ward Member for Woodhouse Park who had requested to address the Committee. Councillor Nunney stated that he had concerns in regard to the air quality surrounding the airport and the impact this had on the health outcomes of those residents in the local vicinity. He stated that there was far too much focus and discussion on growth and expansion at the expense of the immediate climate breakdown. He further made reference to the report produced by Climate Emergency Manchester (CEM) on the subject of the airport and aviation emissions and stated that he endorsed their conclusions and recommendations. He concluded by saying that he supported the introduction of a frequent flyer tax, arguing that further analysis was required to fully understand the benefits that could be realised by adopting such an approach.

The Chair informed the Committee that she had agreed to read out the questions submitted by Climate Emergency Manchester (CEM), in advance of the meeting and requested that a written response be provided by the report authors to CEM and a copy circulated to Members of the Committee for information. She thanked CEM for submitting their questions.

Neil Robinson, Group Corporate Social Responsibility & Future Airspace Director, Manchester Airports Group, in reply to the comments and views expressed by the Committee, said that he recognised and acknowledged the strength of feeling expressed by the Members. He said that the relationship between the airport and the city's carbon reduction ambitions was understood. He described that the importance of addressing climate change had been acknowledged by the airport for many years and the site had responded to this issue by introducing many carbon efficiencies across the airport estate, including the operational efficiencies of the airfield. He said that MAG airports were already carbon neutral, and MAG was committed to a transition to net zero carbon by 2038.

Mr Robinson advised that MAG sought to exert influence to achieve improvements in emissions from the aviation industry both at a national and international level. He stated that the need to address carbon emissions in accordance with the Paris Agreement on Climate Change was understood. He advised that MAG were represented on the Jet Zero Council, a partnership between industry and government to bring together Ministers and Chief Executive Officer level stakeholders, with the aim of delivering zero emission transatlantic flight within a generation, driving the delivery of new technologies and innovative ways to cut aviation emissions.

In reply to the discussion on levying a frequent flyer tax, Mr Robinson stated that MAG did not support this approach, arguing that stimulating innovation and challenging the industry itself would deliver the required technological improvements to reduce carbon emissions from aviation. He further stated that aviation was already substantially taxed higher when compared to other industries.

Mr Robinson advised that the development and investment in sustainable aviation fuels (SAF) would stimulate and innovate green technologies, support a circular economy and deliver green jobs and skills in the North West, recognising the

comment on the appropriate use of land. He further commented that the delivery of SAF would also reduce the particulates emitted from aircraft engines. He also advised that all ground support vehicles across the site would be ultra-low emission vehicles by 2030.

Mr Robinson advised that a common global standard was required in relation to SAF, adding that there was a global United Nations conference planned for 2022 that included this issue amongst others relating to the aviation industry.

In response to the discussion regarding calling for a reduction or end to internal domestic flights, Mr Robinson advised that the majority of those flights included crossing a body of water making any alternative methods of travel, if available, both costly and time consuming for the customer. With regard to access to the airport he referenced the Metrolink extension to the airport site and in response to the car park issue he commented that providing car parking was preferable to 'kiss and fly' arrangements which would result in double the number of journeys to and from the site. He added that MAG would welcome Government funding to deliver electric charging points, however this was currently not forthcoming and he recognised that work was ongoing across Greater Manchester on the issue of electric car charging infrastructure.

In reply to the comments regarding air quality, Mr Robinson stated that this was regularly recorded, and the results reported to Environmental Health Officers within the Council.

The Executive Member for Environment stated that the staff travel policy was being reviewed and she noted the comment regarding the need to ensure the policy that applied to Executive Members and flying was consistent. She described that the Government continued to be lobbied for funding to deliver improved connectivity and active travel across the city. She further advised that as part of the Greater Manchester Clean Air Plan funding was available for taxi drivers to retrofit or upgrade their vehicles. She commented that Members would be invited to sessions that had been arranged to explain the carbon budget setting process as requested by the Committee at a previous meeting. In conclusion she stated that the Leader was committed to working with both herself and MAG to progress the issue of reducing carbon emissions associated with the aviation industry.

The Chair concluded this item of business by thanking all of the guests present for attending the meeting and allowing the Committee the opportunity to scrutinise this important subject matter.

Decisions

The Committee recommend;

1. That the Executive Member for the Environment convene a meeting with Members of the Committee to discuss further the issues raised at the meeting.

2. That the Chair discusses with the Chairs of the Economy Scrutiny and Communities and Equalities Scrutiny Committee the request for the consideration of

the issue of the airport within their respective remits and focus.

3. That a report on both Staff Active Travel Plans and Member Active Travel Plans be submitted for consideration at an appropriate time.

4. That the Executive Member for Environment lobby Government to appropriately fund and incentivise electric vehicle parking and charging at all airports.

5. That the Executive Member for Environment lobby Government to fund and incentivise the conversion to electric vehicles for those industries and business whose vehicles do not access the public highways.

[Councillor Flanagan declared prejudicial interest in the subject of the Airports Group so took no part in the discussion relating to the airport and restricted his contribution to the issue of emissions and carbon reduction.]

ECCSC/21/34 Grounds Maintenance Update: The Use of Pesticides

The Committee considered the report of the Strategic Director (Neighbourhoods) that provided an update on the approach to the use of pesticides when delivering Grounds Maintenance.

Key points and themes in the report included:

- The usage of herbicides as part of a citywide grounds' maintenance weed control programme;
- An update on the works to reduce the City's dependency on herbicides and in particular Glyphosate as the primary weed control method;
- The use of Glyphosate as a standard weed treatment having ceased altogether in parks and gardens, and the use of alternative herbicides significantly reduced to spot and targeted treatments;
- No general Glyphosate based treatments had been used by the Grounds Teams to manage weeds in either Manchester Parks and Gardens, Street Scene, or Northwards communal areas and incidental green space since 2019;
- Describing that in other parts of the public estate the approach had been to reduce use of glyphosate;
- Noting that alternate methods of control were being explored, including organic herbicides, vinegar solutions, mechanical clearance, hot water and hot foam;
- An update on the approach to weed control in cemeteries;
- An update on the approach to weed control across highways and the public estate;
- Describing the work in consultation with landowners and those responsible for maintenance of land to understand the current approach to weed control; and
- Conclusions and next steps.

Some of the key points that arose from the Committee's discussions were: -

- Reiterating the call previously expressed by the Committee for an immediate end to the use of Glysophate as a means of weed control across all settings;

- The need to use the imminent contract re- negotiation as an opportunity to insist the Biffa also stop using Glysophate;
- The use of Glysophate was contrary to the ambitions of the Climate Emergency, commenting upon the need to support biodiversity;
- The need to educate residents and manage their expectations in relation to weed control and emphasise the environmental benefits of these;
- What was the approach and guidance as to the use of Glysophate in allotments;
- Was Glysophate injected or sprayed to tackle Japanese Knotweed;
- The probation service should deploy those offenders undertaking Community Payback sentences to manually remove weeds where required;
- Recognising the work delivered by the Cemeteries Teams, adding that the Committee should endorse a recommendation to increase the numbers of staff in the teams as part of the budget considerations;
- That a briefing note be prepared for information to the Committee that described the actions taken by other Local Authorities to eradicate the use of Glysophate and the alternate measures introduced;
- Information was requested on the approach and alternatives to weed control adopted by Registered Housing Providers across the city; and
- Noting that residents could collectively opt out of having Glysophate used on a specific residential street and more should be done to publicise this to residents.

The Strategic Lead, Waste Recycling and Street Cleaning, acknowledged the comments from the Members and responded by saying that the UK Health and Safety Executive had extended the use of Glysophate until December 2025. She stated that Glysophate is acknowledged as an efficient means of weed control, however the Council had reduced its use as described within the report. She acknowledged the point regarding the need to educate residents in regard to weeds by stating this could be included in individual ward plans. She described that Glysophate was administered via injection rather than spraying when dealing with cases of Japanese Knotweed, and in regard to Allotments this was not within her remit however a response to the question would be requested following the meeting.

The Strategic Lead, Waste Recycling and Street Cleaning, advised that discussions were ongoing with Biffa and a range of stakeholders regarding the use of Glysophate and the adoption of alternative methods of weed control. In response to points raised regarding a cost benefit analysis, the Strategic Director (Neighbourhoods) stated that this analysis would inform part of the budget setting considerations that the Committee would be invited to consider and comment upon.

In regard to cemeteries, the Bereavement Services Manager described that specific designated areas within Southern Cemetery areas had been left to grow, however in those areas where new plots were located a degree of sensitivity was required and accepting that there was a need to balance the environmental needs and those of bereaved families.

Decisions

The Committee recommend;

1. That a briefing note be prepared by Officers that describes the approach taken by

other Local Authorities to stop using Glyspohate and the alternate methods of weed control adopted.

2. That a briefing note be prepared by Officers that describes the approach taken by local Registered Housing Providers to reduce their use of Glyspohate and the alternate methods considered to control weeds.

ECCSC/21/35 Overview Report

The report of the Governance and Scrutiny Support Unit which contained key decisions within the Committee's remit and responses to previous recommendations was submitted for comment. Members were also invited to agree the Committee's future work programme.

Decision

The Committee note the report and agree the work programme.

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Manchester City Council
Report for Information

Report to: Environment and Climate Change Scrutiny Committee – 13 January 2022

Subject: Manchester Food Board

Report of: Consultant in Public Health Manchester Health and Care Commissioning

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Summary

This report outlines the strategic aims and objective of the Manchester Food Board (MFB) in influencing and addressing climate change, including an overview of the MFB Action Plan, updates on recent action, and priorities for 2022.

Recommendations

The Scrutiny Committee is recommended to consider and make comments on the content of the report.

Wards Affected: All

Environmental Impact Assessment - the impact of the issues addressed in this report on achieving the zero-carbon target for the city
Food is included as one of the 6 key themes in the Manchester Climate Change Framework 2020-25. Reducing carbon emissions from the food system is a priority for the Manchester Food Board, and this report outlines the actions we have taken and are planning to take to support this.

Manchester Strategy outcomes	Summary of how this report aligns to the OMS
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	The MFB's strategic priorities include: "Build a more inclusive food and beverage economy, creating a more skilled and efficient workforce." Additionally, the MFB Action Plan contains the aim: "Promote a vibrant food culture and grow a dynamic and robust food economy".
A highly skilled city: world class and home grown talent sustaining the city's economic success	The MFB's strategic priorities include: "Build a more inclusive food and beverage economy, creating a more skilled and efficient workforce." Additionally, the MFB Action Plan contains the aim: "Promote a vibrant food culture and grow a dynamic and robust food economy".
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	The MFB's strategic priorities include: "Preventing malnutrition and hunger in vulnerable groups" and "Building a shared, sustainable food culture across society engaging our ethnically diverse population". Additionally, the MFB Action Plan contains the aim: "Improve Manchester's food security, and reduce inequalities by ensuring that safe, appropriate, and nutritious food is available to all".
A liveable and low carbon city: a destination of choice to live, visit, work	The MFB's strategic priorities include: "Reduce the carbon impact of the food system by elimination of avoidable food waste, excess packaging and ineffective utilisation of natural resources." Additionally, the MFB Action Plan contains the aim: "Reduce environmental impacts throughout the food system with a focus on food waste and a shift to more ecological practices".
A connected city: world class infrastructure and connectivity to drive growth	The MFB's strategic priorities include: "Support innovation which drives more sustainable food systems through the use of data, research and technology." Additionally, the MFB Action Plan contains the aim: "Facilitate collaboration, research and innovation in the food system".

Contact Officers:

Name: Barry Gillespie
Position: Consultant in Public Health
Telephone: 07507 545887
E-mail: barry.gillespie@manchester.gov.uk

1.0 Introduction: Why food?

1.1 The Manchester Food Board (MFB) brings together leading decision-makers from across the business, health, environment, housing, farming, academic, policy, and social sectors. The Board works to provide clarity and strategic leadership on how food can be used to bring about positive, meaningful, and lasting change in Manchester.

1.2 The ways in which we produce, access, and eat food is fundamental to our lives. The work of the MFB reflects the breadth of issues at play in the wider food system, including food poverty, climate change, retail and hospitality, green spaces and food growing, economic development, waste and recycling, health and wellbeing, and community engagement.

1.3 The MFB is part of the Sustainable Food Places (previously Sustainable Food Cities) network of local food partnerships. The MFB also sits on the steering group of Good Food Greater Manchester.

1.4 This report provides background information about the MFB, an update of the MFB's work in the past 6 months and outlines our plans for the next 6 months.

2.0 Background

2.1 In 2018, the Manchester Population Health Team commissioned Manchester-based consultancy firm FoodSync to review the MFB's structure and governance, and to facilitate the work of the MFB moving forward. FoodSync works across the food system, delivering projects for local authorities, the commercial sector, housing associations, and the community, voluntary and social enterprise sector.

2.2 Following consultation with stakeholders of the MFB, local businesses, the public and community voluntary sector, and other key local organisations, the following strategic priorities were agreed in 2019:

1. Preventing malnutrition and hunger in vulnerable groups.
2. Making diets more sustainable.
3. Building a shared, sustainable food culture across society engaging our ethnically diverse population.
4. Increasing local food production.
5. Creating short, transparent supply chains.
6. Build a more inclusive food and beverage economy creating a more skilled and efficient workforce.
7. Reduce the carbon impact of the food system by elimination of avoidable food waste, excess packaging and ineffective utilisation of natural resources.
8. Support innovation which drives more sustainable food systems using data, research and technology.

2.3 Since then, the COVID-19 pandemic and resulting lockdowns have created societal change on a huge scale. To reflect these challenges, an Action Plan

of current priorities has been set, which aims to support a sustainable and equitable recovery for Manchester.

2.4 The Action Plan aims to:

1. Secure access to sustainable, appropriate and nutritious food for all people
2. Promote a vibrant food culture and helps create a dynamic and robust hospitality sector
3. Create more resilient supply chains
4. Reduce the environmental impacts of the food system
5. Facilitate collaboration, research and innovation in the food system

3.0 The past 6 months

3.1 Glasgow Food and Climate Declaration

3.1.1 We co-ordinated Manchester City Council's (MCC) signing of the Glasgow Food and Climate Declaration as part of COP26. In doing do, MCC has committed to pursuing integrated food policies as part of its actions to tackle the climate emergency.

3.2 Ward Climate Action Plans

3.2.1 At the East Didsbury and West Didsbury climate action plan launch workshops in November 2021 we spoke to residents about sustainable food, reducing food waste, and what they could do in their wards to support climate action on food. In doing so, we inspired individuals to become more active 'food citizens'. As other wards launch their action plans, we plan to attend more of these events across the city.

3.3 Food Wave Policy Seminar

3.3.1 The EU-wide FoodWave programme supports young people in campaigning for sustainable approaches to food consumption and production, climate change mitigation, and climate adaptation efforts. We ran a seminar focusing on food-related policy-making as part of the Manchester branch of this programme, working with over 60 young people to help them to influence policy making and create meaningful change in the food system. This event generated support for clear and committed local leadership around sustainable food.

3.4 Community Assembly on Climate Change

3.4.1 We ran five workshops on sustainable food as part of the Manchester Community Assembly on Climate Change, which feeds into the In Our Nature Programme. Over 60 people attended over the course of the week, in five different areas of the city (Levenshulme and East, City Centre and North, Moss Side and Hulme, Wythenshawe and South, Whalley Range and Chorlton). A mandate of actions has been produced by participants in the Assemblies. By providing an opportunity for people to learn about, share, and

enjoy healthy and sustainable food, we supported local people to become more active 'food citizens'.

3.5 Carbon Disclosure Project (CDP)

3.5.1 We supported the Manchester Climate Change Agency by compiling data and information relating to food emissions, for inclusion in Manchester's CPD response. This supported our work in helping reduce the environmental impacts from food in Manchester.

3.6 Academic research: Incorporating Food into Manchester's Climate Change Response

3.6.1 Dr Jo Mylan at The University of Manchester has published Part One of a two-part report that outlines the need for Manchester to have a 'sustainable food mission' to support a 'green and just recovery' from COVID-19. The MFB was approached for comment in the early stages of this research, and provided further comment when the final draft was made available. Part Two of this report will be published in the new year, and we have also shared our comments on this report. By supporting and developing innovative approaches to tackle the wider challenges of the food system, our aim is to ensure that resources can be targeted effectively when developing policy and other mechanisms to improve food sustainability.

3.7 Community food growing in Manchester

3.7.1 Working with the MCC Parks team and other local stakeholders, we conducted two online surveys to find out more about demand for food growing activities in Manchester:

1. For people who currently grow (or used to grow) their own food
2. For people who have never grown their own food

3.7.2 We received 134 responses across the two surveys and will be using the results to inform food growing related policy development across the city.

3.8 Media and marketing

3.8.1 We launched the MFB Twitter page, which now has over 400 followers. We also launched the MFB Newsletter, which is sent out quarterly and showcases good practice and news from across our partner networks. The Newsletter includes an Events section, and we welcome contributions from anyone working on projects that support our Action Plan.

4.0 The next 6 months

4.1 Meetings

4.1.1 The MFB's next meeting will be held in February with further meetings in April and June.

4.2 Food Security Joint Strategic Needs Assessment (JSNA)

4.2.1 We are working with the Population Health Team to develop a JSNA on Food Security. This will outline the challenges associated with poverty and hunger, and provide a comprehensive, integrated overview of the ways in which food insecurity poses a threat to health and wellbeing. Through this approach, we hope to identify barriers to change and make recommendations on how food security can be addressed in Manchester.

4.3 Sustainable Food Week event

4.3.1 This project aims to open up a long-term conversation about sustainable food with key anchor institutions and other partners located on the Oxford Road Corridor. This project will do that by offering those institutions and partners the chance to showcase the actions they have taken (or are planning to take) and the impact they have made (or will make) to ensure their food offer is more sustainable. This showcase will take the form of a week-long event, provisionally called 'Oxford Road Sustainable Food Week'.

4.3.2 The Oxford Road Partnership have lent their provisional support. We are now scoping out this event with members of the Partnership, including the University of Manchester, Manchester Metropolitan University, and Bruntwood, and with potential speakers and delivery partners. The provisional date for this event is May 2022.

4.4 Reducing commercial food waste

4.4.1 Each year, food waste costs the Hospitality and Food Service (HaFS) sector £3.2 billion – an average of £10k per outlet, per year. On average, 18% of the food purchased by the HaFS sector is thrown away, and 75% of this is food that could have been eaten. This project aims to support food businesses in Manchester to reduce the amount of food that goes to waste in their premises.

4.4.2 We are working with WRAP (waste reduction specialists) and their Guardians of Grub food waste reduction programme, which is aimed at the HaFS sector, to develop a workshop specifically for HaFS businesses in Manchester. WRAP offers a range of tools, resources, and training opportunities to help HaFS businesses understand how to measure, monitor, and reduce their food waste.

4.4.3 We will be approaching HaFS businesses in January 2022 to share details of this project and the Guardians of Grub programme, and to invite them to a workshop in Spring.

4.5 Sustainable Business Pioneers Programme

4.5.1 The MFB will be working with local businesses in spring 2022 to coproduce a scheme of work that improves the sustainability of the catering and hospitality sectors. In preparation for that, this project aims to ensure that Manchester small and medium enterprises (SME) food and drinks businesses have the

right knowledge, skills, and support to feed into the development of that scheme.

4.5.2 This project will provide training, information, and support to Manchester-based SME food and drinks businesses on a range of sustainability-related topics, including: food waste; sustainable packaging; carbon literacy; sustainable procurement; seasonal and local food; less but better meat; and meat-free Mondays.

4.5.3 Through this Programme, we will create an unofficial network of sustainability-focused businesses in the city, who can support the work of MFB moving forward.

4.6 School food

4.6.1 Following the closure of Manchester Fayre, MCC's internal school catering provider, all schools in Manchester are now using private catering contractors. We are working with the Education team to identify ways of promoting healthy eating, sustainable diets, and ethically sourced food in schools. We will work with schools, headteachers, parents, and governors, to develop a school food policy or similar mechanism that can be used by all schools to protect and maintain good food standards. We are also in the process of linking with the Manchester Healthy Schools Team.

4.6.2 The aim of this work is to encourage an integrated approach to school food at school level, from lunchtimes and breaktimes to breakfast clubs and food education. We will connect school governors, headteachers, and kitchen catering staff with experts in sustainable procurement, food education, and nutrition, as appropriate.

4.6.3 This is a long term piece of work that we are co-designing with interested schools. We are reaching out to schools via the Education team's internal communications channels to identify potential partners in this work.

4.7 Media and marketing

4.7.1 As well as communicating regularly about our work via Twitter and the MFB Newsletter, the following public national campaigns complement our Action Plan:

- Veganuary (January)
- Fairtrade Fortnight (February)
- Food waste action week (March)
- National Vegetarian Week (May)

4.7.2 We will put additional tailored content out for these events.

5.0 Recommendations

5.1 The recommendations are summarised at the beginning of the report.

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MFB
& partners

Seasonal Newsletter

Autumn 2021 | Issue 4

Hi,

Welcome to the MFB Autumn Newsletter

I've been a councillor since January 2011 and I've worked in the voluntary sector for just over 20 years. I wanted to share with you my "food journey" and how I look at things differently these days.

My first "real job" in Manchester in the early 90s was in a cheese shop. Forget the smell and long hours – I loved it! Eating cheese was just the beginning really – I loved learning about the whole process and the science of cheese making. I have a UK Cheese Guild Diploma gathering dust somewhere, and a couple of medals.

I never really gave much thought as to where my food came from, other than the supermarket; I was raised on meat, potatoes, and veg. But when one of my children asked us to do meat-free Mondays at home, I started to challenge myself a bit more. And seeing the pleasure and satisfaction my husband got from our tiny vegetable patch and herb pots, I kind of caught the growing bug! Now we compost, grow more of our own food, and eat meat-free several times a week.

As I've worked and lived with some struggling communities, I've come to understand more about the financial benefits of growing more veg and eating less meat. Only during my political education and increasing awareness of environmental impact have I made connections between things like meat, food waste, and my carbon footprint. I might always have a thing for cheese though!

I'm really passionate about all Manchester residents being able to make informed food choices, and being Chair of the Manchester Food Board is just another way for me to support that.

Cllr Tracey Rawlins, Chair of Manchester Food Board
Executive Member for Environment

Please do share this newsletter with your networks, and be sure to follow us on Twitter at @MCRFoodBoard for more updates and insights. We welcome your comments; please email rachel@foodsync.co.uk to get in touch.

Manchester signs the Glasgow Declaration

We are excited to announce that Manchester City Council have officially signed up to the Glasgow Food and Climate Declaration. Cllr Tracey Rawlins, Executive Member for Environment and Chair of the Manchester Food Board, is joining local and regional government leaders from around the world in signing the Glasgow Food and Climate Declaration at Glasgow City Chambers.

The declaration recognises that food systems currently account for around one third of global emissions and that transforming the way the food we eat is produced, transported and consumed has a huge role to play in tackling climate change. It notes that cities are leading the way, but that the national and international debate needs to catch up.

This is a big moment for us as a city, and an important step forward in creating a sustainable, inclusive food system. The next step is to consider how we can use the Glasgow Declaration to drive real action and impact around sustainable food in Manchester.

Councillor Tracey Rawlins' comments ahead of the summit: "The eyes of the world will be on Glasgow during COP26 and climate change will be rightly top of the global agenda. The next few days will be an urgent reminder of the need for us all – from governments and global corporations to individuals – to step up in order to drastically reduce carbon emissions and limit the damaging impacts of climate change.

"It's a cause that we have long been committed to in Manchester. We are already seeing – through extreme weather events such as flooding – the impact of climate breakdown right here. The next few days will be a reminder to us all what's at stake, how far we have come but also how much further there is to go and how there can be no let up in reducing our emissions."

Organics in Manchester - Green Shoots of Recovery to a Burgeoning Scene

By Sean Ruffell, Manager & one of the Directors of Organic North Co-operative Wholesalers

In an industry built on long credit-terms and hard-bargaining, Organic North instead look to pay their growers both fairly and promptly. Refusing to compromise their company principles has served them well over the past few years. They're now not just supplying local retailers and veg box schemes but also bakers, restaurants, delis, pubs, processors, caterers, juicers, and plenty more besides.

Read more here.

Doing Zero: Food and Climate Change

By Jess Higham, Creative Projects Manager at Standard Practice Studios

Doing Zero is an exploration of the link between climate change and food by two local neighbourhoods - Harpurhey in North Manchester and Kawangware in West Nairobi, connected via a digital fourth wall. Community members in the two cities took part in joint workshops with climate experts and creatives, and translated their findings into creative outputs.

Find out more details here.

Our Newsletter now includes an Events section. To let us know of any events happening from October-December 2021, please email rachel@foodsync.co.uk or contact us via Twitter at @MCRFoodBoard

Mobilising Manchester: The Manchester Climate Change Community Assembly

By Bob Walley, Creative Engagement Director, Envirolution, and Research Fellow, University of Central Lancashire

Throughout the summer of 2021 the Manchester-based environmental education cooperative Envirolution ran Manchester's first ever Climate Change Assembly, as part of Manchester Climate Change Agency's 'In Our Nature' project. We aimed to gather views from concerned citizens of Manchester, providing a platform for them to be able to communicate them to policy makers and leaders.

The Assembly project is now to be presented at various events in Glasgow as part of the International UN COP26 Climate Change Conference. Find out how you can support us!

Our Local Markets: The stories behind the stalls

By Julie Gimeno, Market Manager at Gorton Market

Over the past few decades, the way in which we shop has changed dramatically. In this fast-moving and unpredictable sector, what does the future hold for traditional local markets? The time I have spent managing some of Manchester's biggest and most diverse markets has taught me that every Market has its own personality, and its own atmosphere.

It's clear to me that, despite the fast-changing pace of retail, local markets continue to play a vital and irreplicable role in our local communities. Customers regularly tell me that they choose to come to the market because they trust our traders. Find out more about how you can support your local independent businesses in the run-up to Christmas.

Please do share this newsletter with your networks, and be sure to follow us on Twitter at @MCRFoodBoard for more updates and insights. We welcome your comments; please email rachel@fo[illegible]k to get in touch.

Upcoming events

Ongoing – see website for dates
Cracking Good Food Cookery School

Cracking Good Food's Cookery School offers classes in all kinds of cuisines, from modern Chinese to pasta making. All proceeds helps support their range of community projects. See what's on and sign up!

Ongoing (4-week blocks)
Starting Plates: Free Healthy Eating Cookery Workshops

Free Healthy Eating Cookery Workshops:

- Wednesdays 12pm at Levenshulme Inspire
- Thursday 1pm at Sacred Heart children's Centre

Learn to cook a range of healthy, simple, yummy dishes from around the world. To join us you need to be a parent/carer to a child under 2 or an expectant parent/carer residing in Levenshulme, Longsight or Levenshulme.

Call Workshop Leader Julie Thornhill on 07895 579914 or email Julie.Thornhill@lev-inspire.org.uk to find out more and reserve your place.

10th of November 2021, for 6 weeks
FoodWave programme – new cohort!

We are looking for 30 x committed and enthusiastic young people (18-35 years old) to join the Food Wave programme for Manchester, learning about sustainable ways to consume and produce food with the aim of influencing food and climate change policy.

To join, simply complete the application form and return it to jon@sowthecity.org.

The second Wednesday of each month
Our Manchester Food Partnership, Lunch & Learn Event

The Our Manchester Food Partnership is a collaborative partnership between food providers in the voluntary sector and statutory partners, Manchester Council, NHS, and social housing providers. Every month we meet for a half hour Lunch & Learn to share learning and promote best practice.

For more details please contact lesley.lancelot@manchester.gov.uk or foodresponseteam@manchester.gov.uk.

Ongoing
Community Fridges in Moss Side and Longsight

The newly launched Community Fridges are welcoming spaces where residents and businesses can share food that would otherwise have gone to waste. Please contact Wendy (wendyredbryan@gmail.com) or Shamime (shamimejan@yahoo.co.uk) for more information, or if you are a local business who would like to donate your surplus food.

Please do share this newsletter with your networks, and be sure to follow us on Twitter at @MCRFoodBoard for more updates and insights. We welcome your comments; please email rachel@foodsync.co.uk to get in touch.

Manchester City Council
Report for Information

Report to: Environment and Climate Change Scrutiny Committee – 13 January 2022

Subject: Climate Change Action Plan Quarterly Progress Report, Q3 October – December 2021

Report of: The Deputy Chief Executive and City Treasurer

Summary

The Council declared a Climate Emergency in July 2019 and developed a Climate Change Action Plan (CCAP) 2020-25, which was approved by Executive in March 2020. Quarterly updates and an Annual Report from year one (2020-21) of the CCAP are now available online, alongside the Quarter 1 report for year two (2021-22) at www.manchester.gov.uk. This report provides an update on progress in Quarter 3 2021-22 (October – December 2021).

Recommendations

The Environment and Climate Change Scrutiny Committee is recommended to note the contents of the report and the progress that has been made in delivering the Action Plan during the last three months (October – December 2021).

Wards Affected: All

Environmental Impact Assessment - the impact of the issues addressed in this report on achieving the zero-carbon target for the city
The Council's Climate Change Action Plan 2020-25 sets out the actions that will be delivered to ensure that the Council plays its full part in delivering the city's Climate Change Framework 2020-25, which aims to half the city's CO_2 emissions over the next 5 years.

Manchester Strategy outcomes	**Summary of how this report aligns to the OMS**
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	The transition to a zero carbon city will help the city's economy become more sustainable and will generate jobs within the low carbon energy and goods sector. This will support the implementation of the Our Manchester Industrial Strategy and Manchester Economic Recovery and Investment Plan.

A highly skilled city: world class and home grown talent sustaining the city's economic success	Manchester is one of a small number of UK cities that have agreed a science-based target and is leading the way in transitioning to a zero carbon city. It is envisaged that this may give the city opportunities in the green technology and services sector.
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	Transitioning to a zero-carbon city can help to tackle fuel poverty by reducing energy bills. Health outcomes will also be improved through the promotion of more sustainable modes of transport and improved air quality.
A liveable and low carbon city: a destination of choice to live, visit, work	Becoming a zero carbon city can help to make the city a more attractive place for people to live, work, visit and study.
A connected city: world class infrastructure and connectivity to drive growth	A zero carbon transport system would create a world class business environment to drive sustainable economic growth.

Contact Officers:

Name: Mark Duncan
Position: Strategic Lead – Resources & Programmes
Email: mark.duncan@manchester.gov.uk

Name: Sarah Henshall
Position: Zero Carbon Manager
Email: sarah.henshall@manchester.gov.k

Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy, please contact one of the contact officers above.

Manchester City Council Climate Change Action Plan 2020-25

Manchester City Council Climate Emergency Declaration July 2019

Manchester Climate Change Framework 2020-25

1.0 Introduction

1.1 This report provides a progress update on delivery of the Council's Climate Change Action Plan for Quarter 3 2021-22 (October - December 2021).

1.2 The progress report has been shared with the Zero Carbon Coordination Group to ensure its accuracy and transparency and will be published in an accessible format on the Council's website.

2.0 Background

2.1 A five-year Climate Change Action Plan (CCAP) 2020-25 went live following approval at Executive in March 2020.

2.2 Updates have been considered by Strategic Management Team and Environment & Climate Change Scrutiny Committee (and previously Neighbourhoods & Environment Scrutiny Committee) throughout the CCAP's first year, with an Annual Report for 2020-21 going to Environment & Climate Change Scrutiny Committee on the 9th September this year. See:

https://democracy.manchester.gov.uk/ieListDocuments.aspx?CId=358&MId=3974&Ver=4

2.3 Previous progress reports dating back to April 2020 are available on the council's website and can be found at:

https://secure.manchester.gov.uk/info/500002/council_policies_and_strategies/3833/zero_carbon_manchester/3

2.4 Following the establishment of the new Environment and Climate Change Scrutiny Committee, regular updates on delivery of the CCAP will be provided via the Quarterly Progress Reports, which have been scheduled into the Committee's work programme for the current year.

3.0 Recommendations

3.1 It is recommended that the Environment and Climate Change Scrutiny Committee note and comment on the progress that has been made in delivering the Climate Change Action Plan during this quarter.

4.0 Appendices

4.1 Appendix 1 - CCAP Q3 Quarterly Progress Report October - December 2021

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Manchester Climate Change Action Plan 2020-25
Progress Update Q3 October – December 2021

Introduction

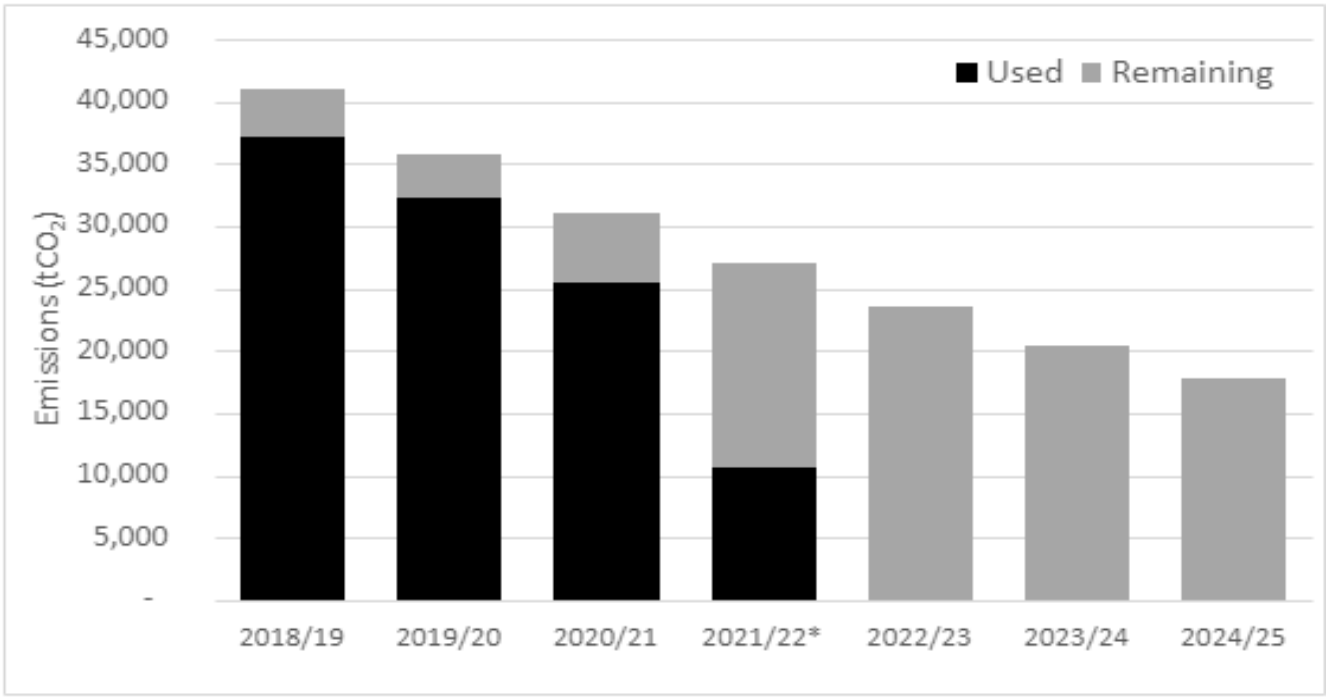
This report sets out the latest progress against delivery of Manchester City Council's Climate Change Action Plan (CCAP) 2020-25. All activity described in this report relates to the period in which the report is issued, in this instance October to December 2021. Emissions data relates to the previous quarter due to the delay in billing and data monitoring, i.e., July to September 2021.

CO_2 Emissions

The CCAP has a target to reduce direct emissions of CO_2 by 50% over the five-year period of 2020-25. To achieve this, the Council has a target to reduce its emissions by 13% every year, for five years.

The CCAP also sets a carbon budget of 119,988 tonnes of CO_2 for the five-year period of 2020-25, calculated using science-based targets.

Figure 1 shows the CO_2 emissions for each year of the CCAP 2020-25, against the annual emissions budget. The graph commences from the baseline year, 2018/19 to highlight the year on year budget reduction. From 2018/19 until the current year, the Council has remained within the emissions budget.



*includes emissions up to Q2 April – September 2021

The carbon budget for 2021-22 is 27,056 tonnes.

BUDGET

27,056 tonnes CO_2 – Emissions **Budget 2021-22**

10,657 tonnes CO_2 – Emissions released to date **2021-22***

*Emissions to date include best estimates due to billing timelines; the annual report qualifies actual emissions.

The Council has emitted 10,657 tonnes of CO_2 between April and September 2021; 39% of the available budget – these are the most up to date figures for the year. The emissions relate to Council buildings, streetlights, waste collection and operational fleet, and business travel. The charts below show a quarter-by-quarter view of emissions from April 2019 for the different Council activities responsible for direct CO_2 emissions. Seasonal differences are shown, e.g., energy consumption and emissions peak in winter, the impact of COVID-19 and overall trends.

Manchester Climate Change Action Plan 2020-25
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Note: where emissions data for the latest quarter has to include some element of a best estimate, for example where accurate billing or monitoring data will become available in future periods, figures are marked as (p) for provisional; where emissions data for the past quarter is revised, on the basis of more accurate data becoming available, figures are marked as (r) for revised. As data is being verified for the whole year at the time of writing this report, figures are marked as (r) for multiple quarters.

Data from two years is included since COVID-19 has meant that emissions in 2020-21 were unusual and in some instances, it is more meaningful to compare Q2 in 2021-22 to Q2 in 2019-20 than to the previous year.

Figure 2: Total emissions

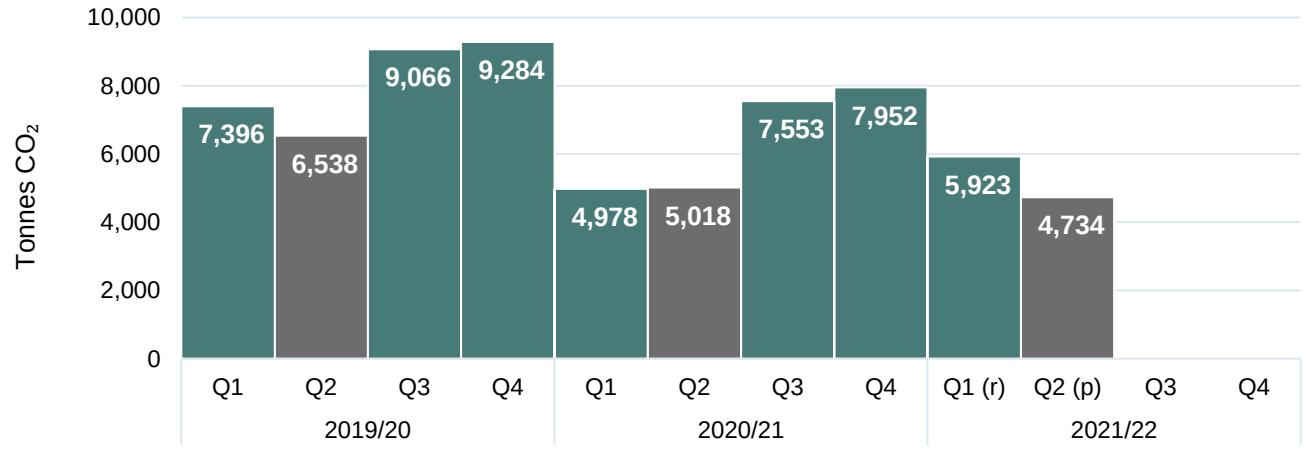

Figure 2 shows the Council's total emissions and reflects the overall downwards trend seen in Figures 3-7 below, alongside expected seasonal trends. Total emissions in Q2 2021-22 are 6% lower than Q2 in the previous year and 28% lower than Q2 in 2019-20 (pre COVID-19).

Figure 3 shows emissions from energy use in Council buildings in Q2 2021-22 are 5% lower than Q2 in the previous year and 27% lower than in Q2 2019-20. This reduction has been driven by the installation of energy efficiency measures (e.g., LED lighting, heat pumps), renewable energy generation capacity (solar PV), and by the decarbonisation of the national grid.

Figure 3: Council buildings emissions

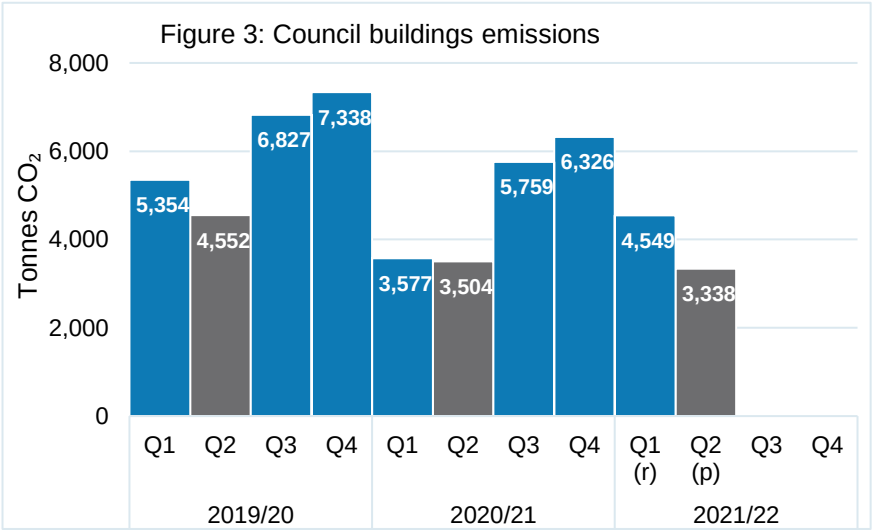

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Figure 4: Streetlights emissions

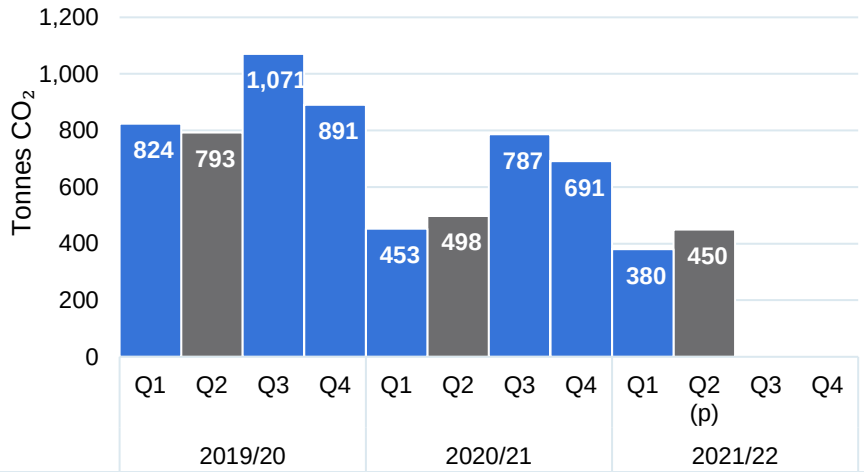

Figure 4 shows that emissions from streetlights are on a downward trend as a result of LED installation. In Q2 of 2021-22 are 10% lower than Q2 in the previous year and 43% lower than Q2 in 2019-20.

The streetlights replacement programme is now complete and future changes in emissions will be due to seasonal influences.

Figure 5 shows emissions from the waste fleet remained relatively consistent between Q1 2019-20 and Q1 2021-22. Emissions fell in Q2 2021-22 and were 11% lower than in Q2 the previous year.

Emissions have fallen in Q2 2021-22 due to the ongoing deployment of electric refuse collection vehicles (eRCVs).

Figure 5: Biffa waste fleet emissions

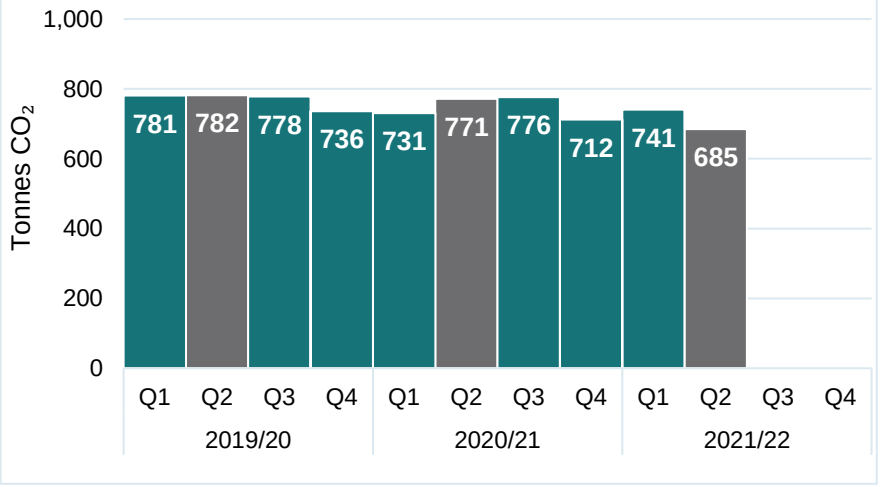

Figure 6: Operational fleet emissions

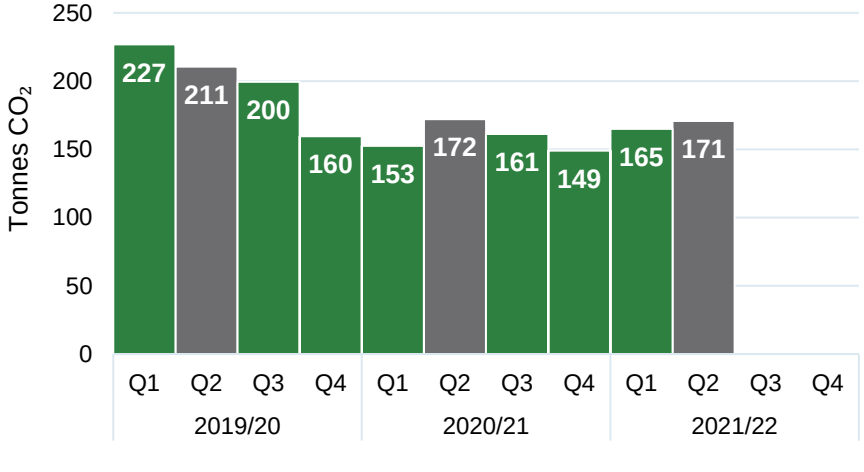

Figure 6 shows emissions from the Council's operational fleet in Q2 2021-22 are 1% lower than Q2 in the previous year and 19% lower than Q2 in 2019-20.

There is a small increase of 4% in Q2 2021-22, when compared to the previous quarter.

The fleet includes short term hires to address operational needs. During the summer months there was an increase in activity particularly around events, for example the Thank You Manchester Weekender, Manchester Pride Festival, Parklife and the Great Manchester Run.

Emissions from business travel by council officers and elected members reduced significantly throughout 2020-21 due to COVID-19 and the changes it created to working patterns, e.g., online meetings.

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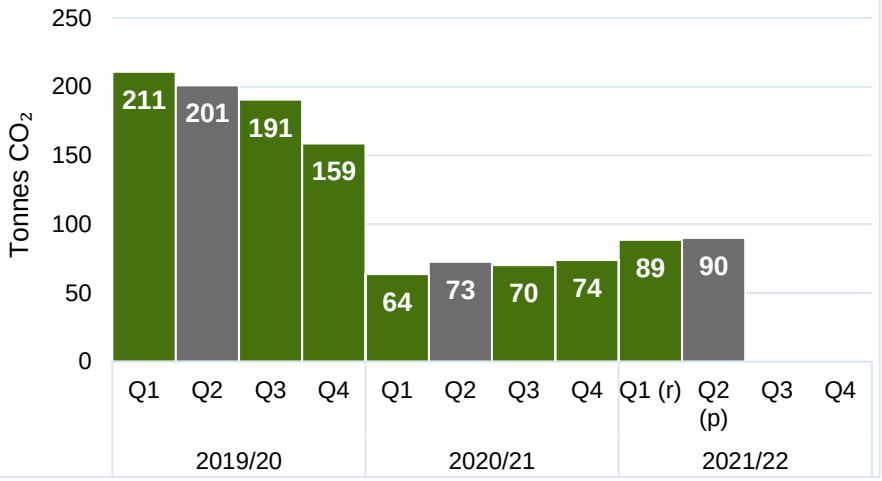
Figure 7 shows that emissions remain lower than pre COVID-19 levels. There is a small increase over the last 18 months as office working patterns resume.

Emissions from business travel in Q2 of 2021-22 are 24% higher than Q2 in the previous year but 55% lower than Q2 in 2019-20. No flights were taken in Q2 2021-22, however travel by rail and by car (staff mileage in their own vehicles, taxis and car clubs) is slightly higher than last quarter.

Figure 7: Business travel emissions



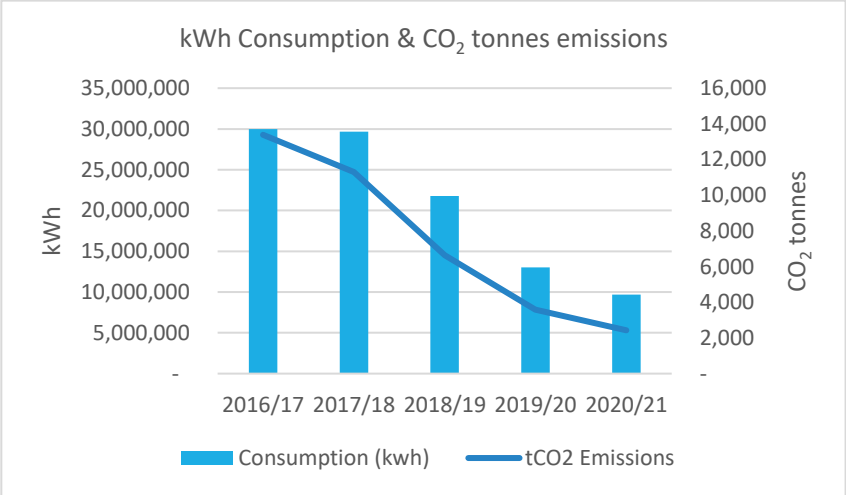
Whilst staff continue to utilise virtual meetings, there has been an increase in the number of face-to-face meetings and events attended by staff and members. The Council's new Sustainable Staff Travel Policy, which was approved by Personnel Committee on the 15 December 2021, will encourage staff to choose more sustainable transport options for business travel, such as walking and cycling for short journey's and utilising public transport where possible as opposed to using taxis and own vehicles.

Key Performance Indicator Spotlight:

The **LED streetlight** replacement programme was completed in December 2020.

The emissions for 2020/21 are **10,957 tonnes of CO_2** lower than in 2016/17, when the project began.

The return on investment is in the region of 10 years.



Progress Report Headlines:

Key Achievements:

- Eleven (of twelve) buildings in the Public Sector Decarbonisation Scheme (PSDS) 1 are under contract with designs complete, planning approvals in place and grid connections secured.
- A bid for £5.9m (including £1.43m Manchester City Council match) was submitted for PSDS3. The bid includes eight buildings and is forecast to save ~683 tonnes of CO_2 per year. The outcome is expected December 2021.
- The Civic Quarter Heat Network (CQHN) gas connection was completed in the first week of October 2021 and the Energy Centre is now in the live commissioning phase. The thermal connections to the off-take buildings (with the exception of the Town Hall) will be completed by mid-December this year.

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- Bee Network Cycle Hire launched along Oxford Road from Piccadilly Station to Fallowfield. The scheme was operational from 18 November 2021, with docking stations being deployed during December 2021/January 2022.
- As part of the Autumn Budget, the UK Government announced an allocation of £1.07bn for Greater Manchester (GM) as part of the GM City-Region Sustainable Transport Settlement. This funding will support key sustainable transport schemes in Manchester including Metrolink, bus priority corridors, walking and cycling infrastructure.
- 10% environmental social value weighting is now standard in all tenders.
- A reusable cups guide has been launched and adds to the suite of sustainable events guides, which are being rolled out across Manchester events. It outlines the benefits of reusable cups and provides advice on managing a reusable cup system.
- £150K of funding has been secured from the DEFRA Urban Tree Challenge fund to support the planting and development of 314 trees.
- West Gorton Park has won the Excellence in Flood and Water Management award at the Landscape Institute Awards.
- The Executive Member for Environment attended and formally signed the Food and Climate Declaration on behalf of the Council at COP26.

New Risks and Issues:

- The PSDS1 work at the East Manchester Leisure Centre is delayed due to utilities obstructing the initial bore hole site and a requirement for planning permission for a new location. The Tennis & Football Centre has been removed from scope due to access issues. Additional projects identified to utilise the funding. All risks are being monitored.
- As a result of the increase in wholesale gas and electricity prices, the CQHN is operating to only meet the Private Wire electrical demand and heat requirements. This avoids importing and exporting power within highly volatile markets and minimises the associated costs and risks. The position is being monitored daily to ensure the most efficient method of operation.
- For the Social Housing Decarbonisation Fund Demonstrator (SHDFD) Scheme the direct costs to One Manchester have increased because of HM Treasury's approach to VAT. One Manchester had assumed 5% for the carbon reduction works but, because the refurbishment includes wider work not classed as carbon reduction, all costs will incur VAT at 20%. HM Treasury have been lobbied on this but to no avail.

Progress Report by Workstream: (by exception)

Buildings and Energy (Workstream 1):

1.1 The Estates Programme (Phase 1) is due to complete this financial year (by March 2022). The Estates Programme focuses mainly on leisure centres, as some of our most energy intensive buildings. Improvements include solar photovoltaic (PV) at the Space Project, LED lighting at Sharp and the completion of works at the Tennis & Football Centre, previously paused due to use as a vaccination centre. The list of buildings in the programme is Wythenshawe Forum; Town Hall Extension; East Manchester Leisure Centre; The Sharp Project; Space Project; Hough End Leisure Centre; Arcadia Sports Centre; Moss Side Leisure Centre; North City Family & Fitness Centre; Belle Vue Sports Centre and Manchester Tennis & Football Centre. In total £6.6m of carbon reduction works were identified, with a forecast carbon saving of circa 1,400 tonnes of CO_2 per annum, a payback period in the region of 10 years and 2.5MW of renewable energy generation capacity.

£1.2m of European Regional Development Fund via the Unlocking Clean Energy in Greater Manchester (UCEGM) Project will deliver a large rooftop solar scheme and battery at the Hammerstone Road depot in Gorton, as well as the solar PV on car ports at the National Cycling Centre. This will save an estimated total of 415 tonnes of CO_2 per annum. Both projects are underway and have dependencies on wider refurbishment projects. The deadline for completion is June 2023.

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The access issue to the car park area at the National Cycling Centre, for the installation of the solar PV car ports has now been resolved.

Funded by the Department for Business, Energy and Industrial Strategy (BEIS), the Public Sector Decarbonisation Scheme (PSDS1) has detailed designs, planning permission, and works contracts in place for all but one building. At the East Manchester Leisure Centre there are issues with utilities obstructing the bore hole drilling. A revised plan has been submitted to planning and if approved, the works will remain within the programme timeframe. All contractors have committed to March 2022 deadline for works to complete. The portfolio of buildings is: Town Hall Extension; the Aquatics Centre; National Cycling Centre; Arcadia Library & Leisure Centre; East Manchester Leisure Centre; Hough End Leisure Centre; Moss Side Leisure Centre; North City Family & Fitness Centre; Wythenshawe Forum; Sharp Project; Space Project and Zion Arts Centre.

A submission to PSDS3 has been made for £5.90m (£1.43m match funding). The outcome is expected in December 2021. The focus of round 3 is on decarbonisation of heat projects and must include a project that decarbonises part or all of the heating within a building. The existing system must be near end of life and if successful, projects must commence by April 2022. The portfolio of buildings is: Active Lifestyles Centre; Claremont Resource Centre; Didsbury Library; Hall Lane Resource Centre; The Place at Platt Lane; One Central Park and the National Football Museum.

1.4 The Council has worked with Local Partnerships to prepare an updated large scale energy generation report for submission to the Senior Management Team on 14 December 2021, proceeding to the Environment & Climate Change Scrutiny Committee on 13 January 2022, the Executive Committee on 19 January 2022, and Full Council on 02 February 2022. The report requests delegated powers to enter into commercial negotiations to enable speedy project progress to purchase a solar asset and or a power purchase agreement.

1.6 The gas connection for the Civic Quarter Heat Network was completed in October 2021 and the Energy Centre is now in the live commissioning phase. Connection tests have been completed and the Combined Heat and Power engine (CHP) is operational. Commissioning of the boilers is also underway. The thermal connections to the off-taking buildings (with the exception of the Town Hall due in 2023/24) will be completed by mid-December 2021. Contracts for the commissioning period (up to 31st December 2021) are in effect. On completion of this period, TradeCo will enter into contract with nPower for gas and electricity supply and electricity export (from 1st January 2022 to 31st December 2025).

1.8 The Social Housing Decarbonisation Fund Demonstrator (SHDFD) Scheme costs have increased due to Treasury's view on the VAT where the scheme works are part of a larger refurbishment, 20% rather than 5% as budgeted. One Manchester has removed the privately-owned properties from the scheme to accommodate the additional costs.

1.10 The Local Area Energy Plan for Manchester has been produced by the Energy Systems Catapult as part of a wider Greater Manchester Local Energy Market Project. The Director of Strategic Development has been briefed on the key findings of the Local Area Energy Plan and discussions are underway on how to take forward.

1.11 The Manchester Low Carbon Building standard will be adopted for any new developments as part the land disposal process.

Travel and Transport (Workstream 2):

2.1 Sixteen electric refuse collection vehicles (eRVCs) are now in operation, an increase of two on last quarter. A further three are due to be deployed by the end of December 2021 and the remaining five are scheduled for delivery by the end of this financial year (March 2022).

2.2 The supply of new electric vehicles (EVs) is challenging due to global demand and the shortage of the EV components. The fleet services manager is maintaining an ongoing dialogue with suppliers. No new EVs were added to the MCC fleet this quarter. A depot review is due to commence in the New Year and will include vehicle charging provision.

Procurement of the eCargo Bike Local Authority Scheme funded by Department of Transport, was awarded to Cycle Waggle, (trading as Manchester Bike Hire) in November 2021. The delivery of equipment will commence in December 2021. There are twelve bikes and 3 trailers for Manchester City Council's fleet, with additional equipment for a public hire scheme, Manchester's universities and 3 voluntary community and social enterprise (VCSE) groups. The scheme launch is scheduled for 17 January 2022 with Councillor Rawlins and the Leader, Councillor Craig.

2.3 The Sustainable Staff Travel Policy was approved by the Personnel Committee on 15 December 2021. Agenda for Personnel Committee on Wednesday, 15th December, 2021, 2.10 pm (manchester.gov.uk)

2.4 Funding from the Active Travel Fund and the Mayor's Challenge Fund is supporting work on several Bee Network schemes:

- Northern Quarter first phase is nearing completion. One of the outstanding elements of the scheme is the new signalised crossing at the junction of London Road and Ducie Street (close to Piccadilly Station) giving improved facilities for pedestrians and cyclists at this busy intersection;
- Stevenson Square phase one is due to start January 2021, the second phase is in consultation, phase three and four are in the design stage;
- Victoria Northern Eastern Gateway scheme will start in January 2021;
- Chorlton Cycleway works moving towards completion;
- Levenshulme and Burnage scheme consultation began in December 2021;
- Rochdale Canal towpath proposals have been agreed;
- the Fallowfield Loop/Manchester Cycleway consultation are complete;
- in Withington proposals are being developed for improvements and road safety measures; and
- the City Centre Triangle proposals are being explored.

The Active Travel Strategy and Investment Plan, and City Centre Pedestrian Network are being scoped and will be commissioned in early 2022. Heaton Park active travel work has started through the development of a Transport Plan and is due to complete in January 2022.

2.5 The GM City Region Sustainable Transport Settlement submission was awarded an indicative £1.07bn, 90% of the bid. Work with Transport for Greater Manchester (TfGM) to deliver this programme is ongoing. Notification of the Active Travel Fund 3 submission is outstanding.

The Greater Manchester Streets for All Strategy was approved by Manchester City Council's Executive Committee on 17 November 2021. The purpose of the strategy is to set out Greater Manchester's progressive approach to managing our streets and making them easier to access and get around by all.

TfGM eHubs project has launched in Chorlton, Chorlton Park, Whalley Range, Ancoats and Beswick with eCargo bikes available to the public on an hourly hire charge. The first phase of the Bee Network Cycle Hire Scheme was operational from the 18 November 2021. Cycles are available along Oxford Road, and Piccadilly Station to Fallowfield. Docking stations in this phase are being deployed during December 2021/January 2022.

2.7 A report by Manchester Airport Group (MAG) was shared with Environment and Climate Change Scrutiny on 09 December 2021 Agenda for Environment and Climate Change Scrutiny Committee on Thursday, 9th December, 2021, 10.00 am (manchester.gov.uk). The report gives an overview of the relationship between aviation and the city's carbon emissions. It sets out how aviation-related emissions need to form part of a nationally agreed carbon budget for aviation, which should be compatible with the Paris Agreement, rather than being accounted for directly in the city's own carbon budget. It also contains information on the work that Manchester Airport have been doing to reduce the ground-based carbon impact of

their activities and the work that the wider Group is doing to ensure that the UK aviation sector achieves net zero emissions by 2050.

Reducing Consumption-based Emissions (Workstream 3):

3.1 The additional 10% environmental social value weighing is now standard for all new procurement contracts. Procurement managers and the wider team have been briefed on how to provide guidance on assessing tenders. As part of the process, companies are questioned about their emissions, and all contracts are provided with a standard questionnaire to capture this information on an annual basis throughout the contract period. Further work is needed to develop a streamlined process for capturing and analysing this data.

3.2 Steps are needed to better understand existing emissions in the Council's supply chain and create a baseline to support further development of KPIs and CO_2 savings targets. A staggered approach will be taken to collecting baseline data across priority areas. Discussions have taken place with the Information and Communications Technology (ICT) department to better understand their existing contracts – some of which already include CO_2 reduction targets.

3.4 The Social Value and Environment Guidance for Suppliers and Bidders for Council Contract Opportunities has been published on MCC's website, with an opportunity for the wider public to provide feedback. Guidance for staff on how to evaluate the contracts is being developed.

3.5 The Council launched a "Reusable Cups at Events Guide" at the Showman's Show and circulated it to stakeholders involved in other local events. Work on identifying next steps to align Parks and Events with the GM Plastic Free Pledge is underway. Consideration is being given to the support and resources required to deliver this.

An ongoing review of the funding criteria for Community Events Funds will support the use of the Sustainable Events Guide. Additional funding has been identified to undertake a study into power for events, with the aim to reduce the need for diesel generators. Work to identify the scope of this project as well as the technical and financial requirements will commence in January 2022.

Climate Change Adaptation and Carbon Sequestration (Workstream 4):

4.1 The procurement of trees for this year's planting season is currently underway. Planting will commence in December 2021 and run through to March 2022. Locations for the planting of around 1000 new mature trees as part of the Manchester Tree Action Plan have been identified. Four new community orchards are also planned for this planting season and will include Philips Park, Clayton and Ladybarn Park, Withington.

4.2 West Gorton Community Park won a Landscape Institute Award for Excellence in Flood and Water Management, one of the most prestigious UK awards for landscape design.

The Our Rivers, Our City vision, a commission from the Horizon 2020 Grow Green project, launched in December. £1m has already been secured for the Groundwork led, Resilient River Valleys programme.

4.3 The Tree Opportunity Mapping report is being reviewed following feedback from the Green & Blue Infrastructure Board and will be complete in the new year.

4.4. A successful bid by the City of Trees to DEFRA Urban Tree Challenge Fund will provide £150K for the continued delivery of the Tree Action MCR Plan by funding the cost of planting and establishing 314 new trees.

Catalysing Change (Workstream 5):

5.1 Carbon Literacy training continues to be delivered. 1168 council staff and 53 members are certified carbon literate, taking account of staff who have left the organisation.

5.3 Areas of focus for embedding climate ambition into the Council's decision-making process have been identified, these include:

- Adding Zero Carbon as a priority to the internal Business Plan 2022/23 template.
- Carrying out a skills audit across directorates to assess the need for more bespoke climate change training.
- Further work on monitoring the benefit of climate action, for example monitoring supplier commitments through the procurement process.
- Further research into carbon pricing tools to help calculate the value of carbon reduction and environmental measures.

The Culture Team has developed a Zero Carbon Culture Guide and guidance for funded Culture organisations, outlining the Council's requirements within new funding agreements. The Guide will be rolled out in 2022 in preparation for the next Culture funding programme commencing in 2023.

5.4 The Climate Change Ward Plans have been developed and will be in place across all Wards by the end of December 2021.

Following on from the success of the Climate Assemblies, work continues to engage with the In Our Nature groups and grow climate change activity across the city. A total of 63 people attended the Climate Assembly events and participated in the development of the mandate, which was presented at COP26 in Glasgow. An evaluation of the Climate Assemblies is underway and will capture participants feedback along with next steps to support the participants and recommendations. The report is expected to be published in January 2022 and will be available at In Our Nature | Commonplace.

Further examples of community engagement, which has been taking place this quarter includes Ward Climate Summits and the development of a Climate Youth Network in Old Moat and Withington.

5.5 Press and Social Media coverage has continued across all workstreams with a particular focus during this quarter on COP26, the Civic Quarter Heat Network, the new Cycleway schemes, plans for a large-scale energy generation project and positive behaviour change messages around waste over the festive period. Further details on press coverage can be found later in the report.

Additions continue to be made to the Council's Zero Carbon webpages, for example information on Green Skills.

5.6 All Manchester Climate Change Agency (MCCA) posts that are funded by the Council have now been filled. The Council's funding has helped to unlock contributions from members of the Manchester Climate Change Partnership (MCCP), which has enabled the funding of an additional Deputy Director role.

5.7 The Council is working closely with the MCCP on the development of the Manchester Climate Change Framework 2.0, which includes an evidence base produced by Anthesis and a number of sector specific workshops. Further work on aviation has also taken place, with a report to Environment & Climate Change Scrutiny Committee on 09 December 2021, presented by the Manchester Airport Group (see action 2.7 update).

5.8 The Council's Education and Skills team are supporting the delivery of this action. Work is underway to engage Headteachers and Business Managers across Manchester's schools to provide advice and support to enable schools to reduce their operational emissions. Links with schools are also being made in relation to the Green Skills agenda.

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5.9 The Greater Manchester Pension Fund joined discussions with a number of other UK and Nordic pension funds to agree to spend £95.4bn on clean energy and climate investments by 2030.

5.10 The Glasgow Declaration on Food and Climate and the Edinburgh Declaration on Biodiversity were signed as part of COP26, the supporting event was attended in person by the Executive Member for the Environment. We are looking at ways of how we embed some of the pledges in these Declarations into our CCAP 2020-25 and how we can influence through our partnerships, for example with the Manchester Food Board.

The Manchester Climate Manifesto was presented to COP26 in person by Envirolution along with a video about the Climate Assembly. Manchester also participated in the UK Cities Climate Investment Commission events as part of Core Cities UK, with London Councils and Future Cities Catapult.

5.11 Work on the Euro Commission funded URBACT Zero Carbon Cities project has continued. The Horizon 2020 Grow Green project received confirmation of its extension to Autumn 2022, to enable the ongoing monitoring and dissemination of the project. The C-Change project has supported the development of a Zero Carbon Culture Guide by Julie's Bicycle to support cultural organisations to reduce their carbon emissions.

5.12 A Green Skills Action Plan has been developed and shared with the Zero Carbon Skills Co-ordination Group to gain partner engagement.

Press Coverage October - December 2021:

Sustainable Events

28 October
Festival Insight: Vision: 2025 Call for Sustainable Return for Events at The Showman's Show
https://www.festivalinsights.com/2021/10/vision-2025-call-for-sustainable-return-at-the-showmans-show/

08 November
Vision 2025: Vision: 2025 Call for Sustainable Return for Events at The Showman's Show
https://www.vision2025.org.uk/vision-2025-call-for-sustainable-return-for-events-at-the-showmans-show/

Tower of Light

18 October
The Manc: Manchester's new Tower of Light has officially been lit up - and this is why
https://themanc.com/news/manchesters-new-tower-of-light-has-officially-been-lit-up-and-this-is-why/

18 October
Place North West: Manchester launches Civic Quarter Heat Network with Tower of Light
https://www.placenorthwest.co.uk/news/manchester-launches-civic-quarter-heat-network-with-tower-of-light/

21 October
Manchester Evening News: Tower of Light switched on - new energy network to provide heat and power to some of the city's most iconic buildings
https://www.manchestereveningnews.co.uk/news/greater-manchester-news/tower-light-switched--new-21918699

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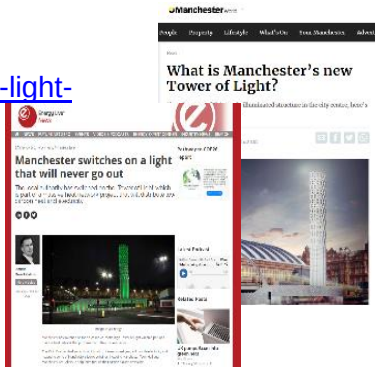
21 October
Manchester World: What is Manchester's new Tower of Light
https://www.manchesterworld.uk/news/what-is-manchesters-new-tower-of-light-3427454



21 October
Energy Live News: Manchester switches on a light that will never go out
https://www.energylivenews.com/2021/10/21/manchester-switches-on-a-light-that-will-never-go-out/

Cycleway Schemes

19 November
Manchester Evening News: New 24/7 hire scheme offering electric bikes launches on Oxford Road
https://www.manchestereveningnews.co.uk/news/greater-manchester-news/new-247-hire-scheme-offering-22206497

03 December
Manchester Evening News: Is this the 'proper square' the Northern Quarter has been missing? New plans for pedestrianisation released
https://www.manchestereveningnews.co.uk/news/greater-manchester-news/proper-square-northern-quarter-been-22356919

04 December
Manchester Evening News: Fresh consultations open on part of Manchester to Chorlton cycling and walking scheme
https://www.manchestereveningnews.co.uk/news/greater-manchester-news/fresh-consultations-open-part-manchester-19400073

Large Scale Renewable Energy Generation

07 October
Evening Standard: Rainy Manchester ponders fighting climate change with solar farm
https://www.standard.co.uk/news/uk/manchester-politicians-manchester-city-manchester-city-council-greater-manchester-b959309.html

07 October
Business Live: Manchester eyes £30m solar farm buy to help fight climate change
https://www.business-live.co.uk/enterprise/manchester-eyes-30m-solar-farm-21790639

07 October
About Manchester: Manchester Council could end up buying a solar farm to protect future energy supplies
https://aboutmanchester.co.uk/manchester-council-could-end-up-buying-a-solar-farm-to-protect-future-energy-supplies/

07 October
Environment Journal: Manchester Council to consider purchasing its own solar farm
https://environmentjournal.online/articles/manchester-council-to-consider-purchasing-its-own-solar-farm/

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07 October
ITV Granada News: No suitable sites to build a solar farm in rainy Manchester
https://www.itv.com/news/granada/2021-10-07/no-suitable-sites-to-build-solar-farm-in-rainy-greater-manchester

08 October
Manchester News Today: Manchester Council could end up buying a solar farm to protect future energy supplies
https://manchesternewstoday.com/manchester-council-could-end-up-buying-a-solar-farm-to-protect-future-energy-supplies/

11 October
Insider: Council considers renewable energy options
https://www.insidermedia.com/news/north-west/council-considers-renewable-energy-options

12 October
Manchester Evening News: Sunsheeeine: Manchester council considering buying its own huge solar panel farm (you know... using that big yellow thing in the sky)
https://www.manchestereveningnews.co.uk/news/greater-manchester-news/sunsheeeine-manchester-council-considering-buying-21781534

Our Rivers, Our City Strategy

08 October
About Manchester: A new strategy to revitalise Manchester's river valleys launched
https://aboutmanchester.co.uk/a-new-strategy-to-revitalise-manchesters-river-valleys-launched/

New Council Leaders Priorities for Manchester

01 December
The Guardian: Manchester city council's new leader vows to prioritise women's safety
https://www.theguardian.com/uk-news/2021/dec/01/manchester-city-council-new-leader-bev-craig-prioritise-womens-safety

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RAG Rating at a Glance:

The actions in the following tables, that will deliver reductions in the Council's direct energy-related emissions have a specific Annual tCO_2 Savings Target. These actions are set to reduce emissions by 50% by 2025 (i.e. delivering a total annual reduction of over 15,000 tonnes) which is a headline commitment of the Action Plan. Detailed progress on emissions reductions is shown at the start of this report.

Workstream 1: Buildings & Energy

RAG	Action Summary	Deadline	Annual tCO_2 Saving Target
1.1	MCC Estates carbon reduction programme	March 2025	4,800
1.2	Manchester Build Standard	December 2020	-
1.3	Buildings and Energy Strategy	April 2020	-
1.4	Large scale renewable energy generation	December 2020	7,000
1.5	LED street lighting	December 2020	220
1.6	Civic Quarter Heat Network	2021	1,600
1.7	Housing stock condition survey	2021	-
1.8	Northwards Housing	Tbc	Tbc
1.9	Commercial and non-domestic buildings	Ongoing	Tbc
1.10	Local Energy Plan for Manchester	April 2020	-
1.11	Leasing and disposing of Council buildings	April 2020	-
1.12	Manchester Local Plan	2023	-
1.13	Partnerships e.g., UKGBC	Ongoing	-

Workstream 2: Travel & Transport

RAG	Action Summary	Deadline	Annual tCO_2 Saving Target
2.1	Electric refuse collection vehicles	March 2021	900
2.2	Replace operational fleet with EVs	Ongoing	400
2.3	Travel policy for staff and members	April 2020	100
2.4	Cycling and walking networks	Ongoing	
2.5	Greater Manchester Transport Strategy 2040	Ongoing	
2.6	City Centre Transport Strategy	2020 & ongoing	
2.7	Aviation emissions and Manchester airport	Ongoing	Tbc
2.8	Sustainable travel incentives	Ongoing	

Workstream 3: Sustainable Consumption

RAG	Action Summary	Deadline	Annual tCO_2 Saving Target
3.1	10% environmental weighting in procurement	September 2021	
3.2.	Tyndall Centre findings on consumption emissions	December 2020	Tbc
3.3.	Eliminate single use plastics in estates and markets	2024	
3.4	Supplier toolkit	December 2020	
3.5	Single use plastics in licensed activities	December 2020	
3.6	Manchester Food Board priorities	Ongoing	

Workstream 4: Adaptation & Sequestration

RAG	Action Summary	Deadline	Annual tCO_2 Saving Target
4.1	Plant 1,000 trees 1,000 hedge trees 4 orchards pa	Ongoing	
4.2	West Gorton 'sponge park'	Ongoing	
4.3	Tree opportunity mapping assessment	December 2020	
4.4	Funding for beacon trees	March 2021	

Workstream 5: Catalysing Change

RAG	Action Summary	Deadline	Annual CO_2 Saving Target
5.1	Carbon literacy	2025	
5.2	10% environmental weighting in procurement (see 3.1)	April 2020	
5.3	Carbon accounting in decision making	Ongoing	
5.4	Community engagement and ward plans	April 2020	

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5.5	Citywide communications strategy	April 2020	
5.6	Fund Manchester Climate Change Agency	April 2020	
5.7	Support Manchester Climate Change Partnership	December 2020	
5.8	Large scale event with schools	June 2020	
5.9	Influence GM stakeholders to decarbonise	Ongoing	
5.10	Play a part in COP26	November 2020	
5.11	International networks and projects	Ongoing	
5.12	Green Skills Plan	September 2020	
			15,020

Manchester City Council
Report for Resolution

Report to:	Environment and Climate Change Scrutiny Committee – 13 January 2022 Executive – 19 January 2022 Council – 2 February 2022
Subject:	Large Scale Renewable Energy Generation Outline Business Case
Report of:	The Deputy Chief Executive and City Treasurer

Summary

The purpose of this report is to seek a decision to support the proposal to secure delegation from Executive for the Council to enter commercial negotiations to progress the purchase of a suitable solution with options being a solar asset and / or a Power Purchase Agreement (PPA).

The Council's Climate Change Action Plan (CCAP) has a target to reduce direct emissions of CO_2 by 50% over the five-year period of 2020-25. In addition, the Council has committed to be zero carbon by 2038.

Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 reductions by 2025 with savings to be delivered by a, "feasibility and business case for a large-scale energy generation scheme from large scale Solar PV or Onshore or Offshore Wind on Council land and buildings, or sites in third party ownership".

Local Partnerships (LP) were appointed in November 2020 to deliver the feasibility study. The, "Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council" was completed in April 2021. It concluded that the Council has two options: purchase a solar PV facility or negotiate a power purchase agreement (PPA). Both options were assessed to be better than the "do nothing" option.

In October 2021, Executive approved a recommendation for the Deputy Chief Executive and City Treasurer to establish a delivery team to develop the options, with a view to returning to the Executive with a proposal to progress the work. This proposal and associated recommendations are contained in this report.

Recommendations

The Environment and Climate Change Scrutiny Committee is:

1. Invited to comment on the report and note the options in Section 4 available to the Council.

2. Endorse the recommendations made to Executive to grant delegation for the Deputy Chief Executive and City Treasurer to enter into negotiations for the purchase of a solar asset / PPA to meet the Council's 2020-25 CO_2 emissions reduction target and contribute positively to our longer term zero carbon 2038 target through:

    - development / purchase of a suitable large-scale solar PV facility
    - a suitable direct PPA of renewable energy

The Executive is asked to:

1. Note the options in Section 4 available to the Council.

2. Note that should the direct purchase of a solar asset be pursued this will be funded via borrowing and require Council approval.

3. Agree to grant delegation for the Deputy Chief Executive and City Treasurer, in consultation with the Leader, Executive Member for Finance and the Executive Member for Environment to negotiate for the purchase of a solar asset / PPA and any associated corporate documentation to establish a Special Purpose Vehicle if required, to meet the Council's 2020-25 CO_2 emissions reduction target and contribute positively to our longer term zero carbon 2038 target through:

    - development / purchase of a suitable large-scale solar PV facility
    - a suitable direct PPA of renewable energy

Wards Affected: All

Environmental Impact Assessment - the impact of the decisions proposed in this report on achieving the zero-carbon target for the city
Action 1.4 of the Council's Climate Change Action Plan 2020-25 targets 7,000 tonnes of annual CO_2 savings by 2025. The Plan sets out the actions that will be delivered to ensure that the Council plays its full part in delivering the city's Climate Change Framework 2020-25 which aims to half the city's CO_2 emissions over the next 5 years.

Our Manchester Strategy outcomes	Contribution to the strategy
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	The transition to a zero carbon city will help the city's economy become more sustainable and will generate jobs within the low carbon energy and goods sector. This will support the implementation of the Our Manchester Industrial Strategy and Manchester Economic Recovery and Investment Plan.
A highly skilled city: world class and home grown talent sustaining the city's economic success	Manchester is one of a small number of UK cities that have agreed a science-based target and is leading the way in transitioning to a zero carbon city. It is envisaged that this may give the city opportunities in the green technology and services sector.
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	Transitioning to a zero-carbon city can help to tackle fuel poverty by reducing energy bills. Health outcomes will also be improved through the promotion of more sustainable modes of transport and improved air quality.
A liveable and low carbon city: a destination of choice to live, visit, work	Becoming a zero carbon city can help to make the city a more attractive place for people to live, work, visit and study.
A connected city: world class infrastructure and connectivity to drive growth	A zero carbon transport system would create a world class business environment to drive sustainable economic growth.

Full details are in the body of the report, along with any implications for

- Equal Opportunities Policy
- Risk Management
- Legal Considerations

Financial Consequences – Revenue

It is expected that the revenue requirements needed to take this forward will be met from existing directorate budgets; if this is not possible, the financial consequences will be that an additional funding requirement is needed to establish a delivery team, including the cost of engaging the necessary external technical support.

Financial Consequences – Capital

It is not expected that there will be any immediate financial consequences to the capital budget from the content of this report. However, it should be recognised that the outcome of the report options will have capital cost implications.

Contact Officers:

Name: Matthew Bennett
Position: Director of Commercial and Operations
Email: matthew.bennett@manchester.gov.uk

Name: Mark Duncan
Position: Strategic Lead - Resources & Programmes
Email: mark.duncan@manchester.gov.uk

Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council – Local Partnerships (April 2021)

Large Scale Renewable Energy Generation Feasibility Summary Study - Report to Environment and Climate Change Scrutiny Committee, 14 October 2021 and Executive, 20 October 2021

1.0 Introduction

1.1 The purpose of this report is to seek a decision to support the proposal to secure delegation from Executive for the Council to enter commercial negotiations to progress the purchase of a suitable solution with options being a solar asset and / or a Power Purchase Agreement (PPA).

1.2 The Council's Climate Change Action Plan (CCAP) has a target to reduce direct emissions of CO_2 by 50% over the five-year period of 2020-25. In addition, the Council has committed to be carbon zero by 2038.

1.3 Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 by 2025 savings to be delivered by a "feasibility and business case for a large-scale energy generation scheme from large scale Solar PV or Onshore or Offshore Wind on Council land and buildings, or sites in third party ownership".

1.4 Local Partnerships (LP) were appointed in November 2020 to deliver the feasibility study. The study, "Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council" was completed in April 2021. It concluded that the Council has two options: purchase a solar PV facility or negotiate a power purchase agreement (PPA). Both options were assessed to be better than the "do nothing" option.

1.5 In October 2021, Executive approved a recommendation for Deputy Chief Executive and City Treasurer to establish a delivery team to develop the options, with a view to returning to the Executive with a proposal to progress the work.

2.0 Key findings of the Feasibility Study

2.1 Solar PV is recommended as the most appropriate renewable technology. Onshore wind developments are very limited in availability and are often subject to planning challenges. Offshore wind is generally too large a scale and requiring much longer lead in times to be suitable for our needs.

2.2 The size of requirement needed to deliver 7,000 tonnes CO_2 annual savings is equivalent to ~33MW of solar PV. To deliver benefits beyond this point and to contribute more significantly to the Council meeting its target to be zero carbon by 2038, then ~45-50MW of solar PV would be required. The Council should consider adopting this size of requirement to future-proof residual emissions through to 2038, facilitating an earlier reduction of a greater proportion of the Council's (Scope 2) electricity emissions and maximising the potential for carbon reduction through renewable energy.

2.3 An area of ~100 Ha of land is required to deliver the 7,000 tonnes CO_2 requirement. The Council has already deployed significant renewable energy generation capacity on its own buildings and is developing proposals to maximise this as part of the ongoing carbon reduction programme. There is no suitable land in Council ownership to deploy 45-50MW of solar capacity. No opportunities were identified within Manchester for a partnership project but we will continue to work with GMCA to identify local opportunities if possible.

2.4 The GMCA Go Neutral project has assessed opportunities for small-scale renewable energy assets across the city-region. Based on initial findings it is estimated that ~7-14MW of additional capacity could be available on Council-owned buildings and small parcels of land in Manchester. This is insufficient to meet our requirements.

2.5 The feasibility study concluded that the Council needs to look out of area to deliver the required size of generation, given there are no local opportunities for solar PV at the required scale. Additionally, the study noted that where levels of irradiance are higher, solar PV schemes deliver a better return on investment (ROI). Irradiance levels are potentially 13% higher in the south of the UK compared to Manchester and hence generate a higher return on investment or ROI.

2.6 To provide the Council with a deeper understanding of the available options, LP used data from Aurora Energy Research (provider of commercial modelling and forecasting data for renewable technologies). The data was used to generate an options appraisal based on current and forecasted pricing. Net Present Value (NPV) calculations were appraised over an 8 year and a 25-year period and were compared to a 'do nothing' scenario, i.e., the Council's current green electricity tariff.

2.7 This calculation showed that all options have positive NPV outcomes compared with 'do nothing'. There is a solid value for money basis to either enter a suitable PPA or asset purchase agreement and the Council should therefore seek to change its current supply arrangements.

2.8 The report concluded that a budget of £27m–£30m was the estimated cost for an asset purchase. A solar asset is anticipated to have a life of 35-40 years. Should this option be selected, and a suitable facility identified, the Council would need to be able to move at speed since projects of this nature coming to market are relatively few and are likely to be in high demand.

3.0 Establishing a Working Group

3.1 In October 2021, the Deputy Chief Executive established a working group and project team. The project team appointed LP to support further project development. This includes updating the findings of the feasibility study to reflect current prices and market availability, to carry out future energy demand analysis and to further explore financing options.

3.2 The team have been progressing the two agreed options to purchase a solar facility twin-tracked with a PPA. This approach allows us to progress the two recommended options in line with the findings of the feasibility study and is necessary to allow us to make the correct purchase decision to meet the CO_2 targets, and timescales as set in the Council's CCAP.

4.0 Updated Market Availability Assessment & Pricing

4.1 There are several potential sites currently available to purchase. At this stage there is sufficient information to model two different scenarios, with more to follow. The Council is in the process of entering into Non-Disclosure Agreements (NDAs) with the developers for two sites in order to progress discussions:

- **Option 1** – 45.3 MW scheme (south of England). This is the same scheme that the Council reviewed in the feasibility report. Some of the numbers have changed slightly. Irradiance is 1077 kwh/kwp and the scheme is due to connect in June 2023.

- **Option 2** – Two schemes (58 MW total) comprising of 21 MW with an irradiance of 1091kwh/kwp and 37 MW (Southern England). Irradiance of 1019kwh/kwp. The 21 MW scheme connects in March 2022 and the 37MW scheme connects in June 2022.

4.2 There are still no potential schemes identified within the Council boundary or local surrounding areas. Officers have been in contact with the GMCA Environment Team, and they have advised that the launch of their Go Neutral procurement framework is scheduled for early 2022. This will provide us with an additional route to make our needs known to potential suppliers.

4.3 The market has changed significantly since the initial feasibility report was produced (April 2021). Assets have continued to be brought forward and investor confidence in merchant assets i.e., those not supported by subsidy such as Feed in Tariff (FiT) or Renewables Obligation Certificate (ROC) have increased. There has also been an announcement of further funding rounds for Contract for Difference, although it is likely that most of this will support offshore wind and Scottish wind projects.

4.4 Changes in global supply chains and energy markets have impacted on the economics of solar and there is an increase in capital build costs and in the PPA prices achieved at market. In common with many other local authorities, the Council has felt their exposure to the volatile energy markets in recent months and is keen to obtain a more secure energy pricing framework.

4.5 Council officers have met with GMCA colleagues and shared our latest position. The GMCA are launching their Go Neutral energy procurement framework early in 2022 and this will be considered as an additional potential route to market.

5.0 Updated Energy Demand Assessment

5.1 The Council's Energy Management Team, with input from the project team, has assessed the Council's future energy needs considering a range of factors affecting future energy demand and the Council's CO_2 reduction needs.

5.2 Based on the Council's projected future energy demand, LP's assessment of the Council's needs is a solar generation asset of between 45MW and 60MW at current market rates costs of c. £30m – to £39m. This would be sufficient to meet our current target to reduce emissions by 7,000 tonnes CO_2 by 2025 and to contribute to our overall target to be Zero Carbon by 2038.

5.3 The exact size of the requirement is a function of both the electrical demand of the Council over time and the location of generation. Irradiance levels mean that if a scheme is bought in the south, it could be smaller than a scheme in the north. As there are only a limited number of viable options available on the market, there will be a need to review schemes in a range of 45 MW and 60 MW, depending on location. Schemes with higher irradiance attract a higher value. It is possible that to achieve the required levels of CO_2 savings, a scheme may need to be oversized, with any surplus power generated being sold.

5.4 With reference to the two options detailed in Section 4, an assessment has been carried out to consider the alignment between the production from the asset and consumption by MCC. The advantage of these options is they are scheduled to be available by the June 2022 target. The decarbonisation assessment for each option looks at the available carbon savings from a base year of 2025 until the decarbonisation date of 2038.

- **Option 1** – 45.3 MW (southern England) would provide sufficient CO_2e savings above the Council's demand in the early years and will meet the 2025 target. However, from 2035 onwards, the Council's forecast Scope 2 emissions exceed the available CO_2e savings from the asset. It would offer 95% of the 2038 target.

- **Option 2** – 58MW across two sites (southern England) offers additional capacity for CO_2e savings above the Council's demand in the early years. The 2038 target is met in full. Whilst production means the supply and demand become closer in the later years, the assets always produce more electricity than the forecast demand and surplus could be supplied to third parties locally (e.g., schools) or traded directly.

Other options will be considered as discussions move forward with developers.

6.0 Financing

6.1 The implications for both revenue and capital budgets would be as follows:

- revenue for the specialist advice needed in 2022/23 (within existing budgets)
- capital for the purchase itself in 2022/23 or 2023/24 if the direct purchase of an asset is approved. This would be funded from borrowing and require Council approval.
- revenue in the long term for the electricity consumption costs of a solar asset / PPA versus the current tariffs and budget.

The quantum of these implications will be determined during the next stage of the process i.e., when NDAs are in place and allow for detailed negotiations and analysis of the business models for individual schemes.

6.2 Purchasing a scheme has the potential to offer value for money by reducing the net cost of each unit of electricity used by the Council as well as providing protection from market price volatility.

6.3 A direct purchase has a longer-term benefit, and the 25 year period is aimed at capturing the different values over time. The final overall life of an acquired project is likely to be in the range of 25-35 years.

6.4 Our feasibility study and business case development work to date demonstrates that the direct purchase of the solar generation asset delivers a stronger Net Present Value (NPV) than a PPA, although all options demonstrate a positive return versus do nothing. Both an asset purchase and a PPA should also deliver revenue savings. As negotiations move forward and actual costs become known, a full financial model will be constructed and the NPV calculations updated accordingly.

6.5 Should the direct purchase of a solar asset be pursued this will be funded via borrowing and require Council approval in due course.

7.0 Current Energy Purchasing Policy

7.1 The Council currently purchases electricity via a green energy tariff. The supplier promises to match all or some of the electricity used with renewable energy, which feeds back into the National Grid. A green energy tariff means the electricity still comes from the grid. As only a proportion of grid electricity comes from renewable green sources, the energy currently purchased by the Council cannot be reported as a reduction in carbon emissions. Our current contracts are as follows:

- Gas – Current contract ends 31st March 2022. The new gas procurement framework commences January 2022 (1 year agreement with 3 year option to extend).
- Electric – Current contract and framework expires September 2022.

The contract periods have been adjusted to secure competitive prices and consider longer term energy generation and PPA options.

7.2 Most schools and academies in Manchester currently source their electricity via the Council's supply arrangements. For the baseline year 2019/20, this amounted to approximately 28GWh of additional load. If and when heat decarbonisation is delivered to the school estates, demand will increase significantly. Schools and academies gas usage is currently ~ 54GWh annually.

7.3 The Council's Energy Management Unit also purchases energy for Bolton Council. The current electricity demand for their operational estate is 22GWh with an additional 13GWh for schools and academies in that area.

7.4 Moving to direct energy generation through an owned asset or PPA(s) of renewable energy impacts on the existing energy purchasing approach. Whilst the joint purchasing of energy achieves better pricing for all parties, there is currently no contractual agreement or long-term commitment with the above parties to tie them into the Council's procurement arrangements. It is unviable within the timescales to include within either the sizing of this asset or an associated PPA.

8.0 Accounting for Emissions

8.1 The objective of the project is to generate / purchase electricity from a direct renewable energy source to deliver a direct reduction in the Council's CO_2 emissions. To achieve the reduction, the energy must be from a source which is traceable, permanent, and net additional renewable energy. We believe that the purchase of a solar asset / PPA of the kind proposed meets these requirements.

8.2 There are some complexities around the reporting of emissions and emissions reductions when scaled up to sub-regional and national level and we need to be mindful of these.

8.3 In accounting for their own emissions, organisations such as the Council should draw a boundary around their emissions which represents either their area of operational control or their area of financial control. In this case, a solar asset or other generation assets linked to supply for a PPA would be deemed to be within our boundary of control.

9.0 Recommendations

9.1 The recommendations are detailed on the cover page of this report.

10.0 Contributing to a Zero-Carbon City

10.1 Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 savings by 2025 and is a key action to ensure that the Council plays its full part in delivering the city's Climate Change Framework 2020-25 which aims to halve the city's CO_2 emissions over the next 5 years.

11.0 Contributing to the Our Manchester Strategy

(a) A thriving and sustainable city

11.1 The transition to a zero carbon city will help the city's economy become more sustainable and will generate jobs within the low carbon energy and goods sector. This will support the implementation of the Our Manchester Industrial Strategy and Manchester Economic Recovery and Investment Plan.

(b) A highly skilled city

11.2 Manchester is one of a small number of UK cities that have agreed a science-based target and is leading the way in transitioning to a zero carbon city. It is envisaged that this may give the city opportunities in the green technology and services sector.

(c) A progressive and equitable city

11.3 Transitioning to a zero-carbon city can help to tackle fuel poverty by reducing energy bills. Health outcomes will also be improved through the promotion of more sustainable modes of transport and improved air quality.

(d) A liveable and low carbon city

11.4 Becoming a zero carbon city can help to make the city a more attractive place for people to live, work, visit and study.

(e) A connected city

11.5 A zero carbon transport system would create a world class business environment to drive sustainable economic growth.

12.0 Key Policies and Considerations

(a) Equal Opportunities

12.1 There are no equal opportunity issues to note that should arise from the content of this report.

(b) Risk Management

12.2 The key risk is to successful delivery of the Council's Climate Change Action Plan as action 1.4 is targeted to generate 7,000 tonnes of annual CO_2 savings by 2025 and the earlier this is delivered, the greater the contribution to staying within the carbon budget for the five year period.

(c) Legal Considerations

12.3 The legal issues to note from the content of this report are that in regard to an asset purchase, PPA or a hybrid it will be necessary to consider the relevant public contracts regulations and the Council's own Contractual Standing Orders in regard to procurement and the processes associated with procurement and associated decision making along with relevant decision making processes for the acquisition of an asset and any agreements entered into in association with any proposal. In this regard appropriate delegated decision making powers and approvals will also need to be considered.

12.4 Legal Services will provide support and advice in regard to such matters and also in regard to the recommendations in this report seeking such appropriate expert technical and professional support and advice as shall be appropriate.

13.0 Appendices

Appendix 1 - Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council – Local Partnerships (April 2021)

Appendix 2 - Large Scale Renewable Energy Generation Feasibility Summary Study - Report to Environment and Climate Change Scrutiny Committee, 14 October 2021 and Executive, 20 October 2021

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Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council

Version No: FINAL

Issue Date: 12 April 2021

1 Executive Summary

1.1 Background and Purpose

Manchester City Council ("the Council") has declared a climate emergency and set a science-based target to be zero carbon by 2038. It has already reduced its direct emissions by 48% from a 2009/10 baseline[1]. Ongoing work to reduce emissions further is set out within the Council's Climate Change Action Plan (CCAP) for 2020-25. The CCAP includes a target to halve emissions again within this 5-year period and sets a carbon budget for the period too.

Work is underway across several different strands to meet these emission reduction targets – from improving the energy efficiency of street lighting to decarbonising heat within the estate and investing in large scale renewable energy generation capacity. In October this year, Local Partnerships was appointed to carry out a feasibility study to investigate options for large-scale renewable energy generation - in line with Action 1.4 of the CCAP which sets a target to reduce CO_2 emissions by 7,000 t pa.

1.2 Methodology

This report is based on a desk-based review of opportunities on land assets owned by the Council, a review of potential market opportunities to acquire assets from third parties and a review of potential power purchase agreement (PPA) options. For the reasons set out in section 3.1 of this report the analysis of self-development and asset purchase concentrates on solar PV generation. PPA options consider all alternatives.

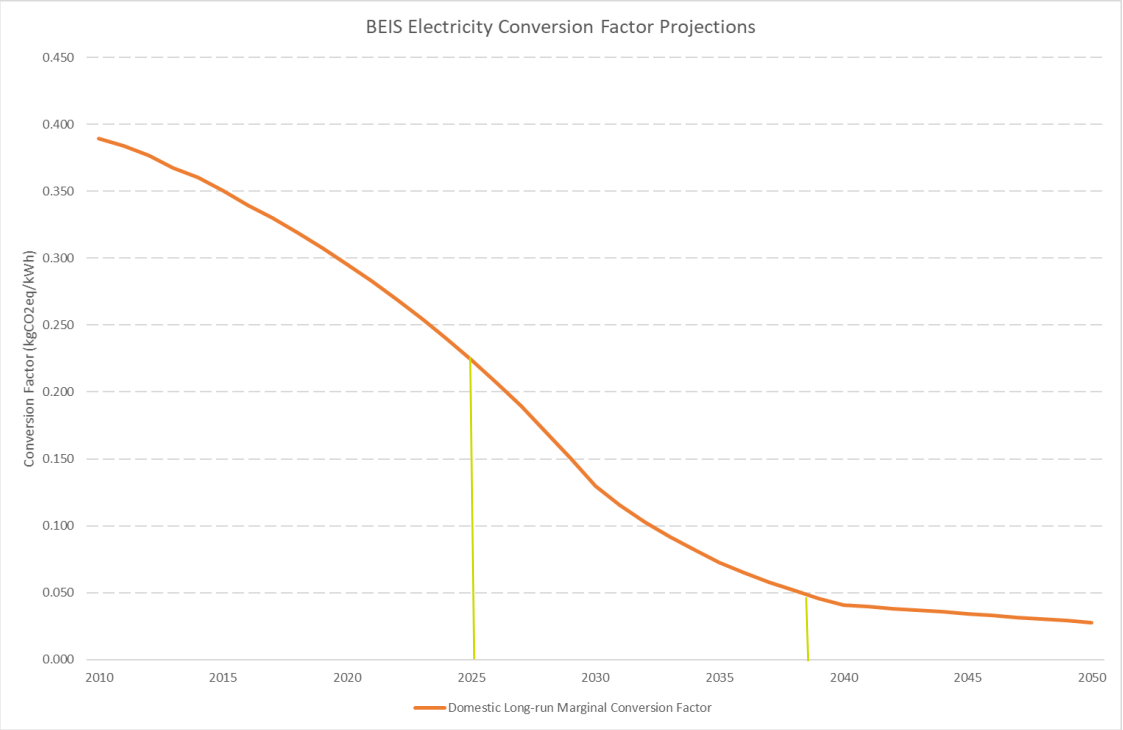
1.3 Size of the requirement

Carbon displaced through renewable energy generation can be described as the avoidance of carbon emissions through grid supplied electricity. The UK has seen significant reductions in the carbon intensity of grid supplied electricity over the last ten years resulting from the retirement of most of the UK coal fired power stations and the introduction of gas fired power stations and renewable energy.

For the UK to achieve net carbon zero emissions by 2050 the complete decarbonisation of the electricity supply will be needed. This will require several measures including a fourfold increase in renewable energy generation. As this happens the carbon intensity of grid supplied electricity falls (see Figure 1)

1 https://democracy.manchester.gov.uk/documents/s16275/Final%20MCC%20Climate%20Change%20Action%20Plan%202020-25.pdf

Figure 1: Forecast for electricity grid decarbonisation 2010-2050



Based on the requirement to avoid 7,000 tonnes of tCO_2e by 2025, the Council would require a solar PV portfolio of 33 MW in addition to that already identified in its carbon savings programme. By the Council's net zero emissions date of 2038 the carbon intensity of grid supplied electricity has fallen significantly. In 2038 it is anticipated that the Council will have residual emissions of around 2,913 tonnes of tCO_2e which would require a solar PV portfolio of around 60 MW to offset. The methodology for calculating the 2025 and 2038 requirements is set out in section 3.2.1 and 3.2.2.

The Council will only be able to offset emissions from electricity generation against its electricity consumption (i.e. scope 2 emissions). In setting a target requirement consideration also needs to be given to the future consumption of electricity by the Council. 2018/19 electricity consumption was around 49GWh (excluding schools). A further 4GWh/pa reduction is forecast from the street lighting programme, leaving a residual requirement of around 45 GWh/pa. No further assumptions have been made on volumes due to uncertainties, with volumes set to decrease as a consequence of energy efficiency and rationalisation of property, but also set to increase through the electrification of heat and transport.

At an irradiance level of 945 kwh/kwp (see section 3.2 for further details) the annual consumption would equate to around 47.6 MW.

Bringing together these assumptions the Council should consider adopting a target of around 45-50 MW of generation (solar PV or equivalent wind) in order to meet its ongoing requirement.

Recommendation 1: The Council should consider adopting a target of 45-50 MW of solar PV generation (or equivalent wind) now as this will:

a) **Provide a future proof solution which will also deal with residual emissions in 2038.**

b) **Allow a larger proportion of the Council's scope 2 electricity emissions to be reduced from an earlier point in time. This will help the Council in achieving its carbon budget target.**

c) **Maximise the potential of carbon reduction through generation or power purchase.**

Figure 2 below sets out how this requirement is likely to be met.

Figure 2: Opportunities for renewable energy generation

1.4 Council owned sites

The Council has already identified around 6.67 MW of rooftop and carport solar PV (see Table 1) that could realistically be delivered on its own assets.

Table 1: Manchester City Council – Estate wide opportunities for renewable generation

Opportunity	Sites	Solar capacity (MW)
Potential roof mounted solar schemes (Phase 1 Buildings Carbon Reduction)	a) Wythenshawe Forum	0.165
	b) The Sharp Project	0.790
	c) Space Project	0.494
	d) Hough End Leisure Centre	0.188
	e) East Manchester Leisure Centre	0.179
	f) Arcadia Sports Centre	0.166
	g) Moss Side Leisure Centre	0.101
	h) Belle Vue Sports Centre	0.375
	i) Manchester Tennis and Football Centre	

		0.103
Potential roof mounted solar schemes (Public Sector Decarbonisation Fund)	j) Arcadia Library & Leisure Centre k) Manchester Aquatics Centre l) Manchester Tennis and Football Centre m) North City Family & Fitness Centre n) Sharp Project Media Centre o) Wythenshawe Forum p) Zion Arts Centre q) Space Studios	0.082 0.367 0.165 0.146 0.273 0.142 0.102 1.20
Potential roof mounted and carport schemes (ERDF Unlocking Clean Energy)	r) Hammerstone Road – roof mounted s) Manchester Velodrome - carport	0.717 0.915
	Total Solar PV	**6.67**

These schemes are already accounted for in relation to carbon accounting and therefore do not contribute towards the 7,000 tCO2e target.

1.5 Further potential sites

The Council has limited land available to support large-scale solar PV generation. The requirement identified in section 1.3 will require around 100 Ha of land to achieve, which would be hard to find in a densely built-up area.

Table 2 sets out the criteria that have been considered in assessing sites for potential suitability:

Table 2 – screening tests for potential projects – Solar PV

Risk Category	Action and Information Sources
Viability	Size and orientation. For a scheme to offer sufficient financial return on investment to pay for a grid connection it is likely to need to be > 1MW. A site of this size would require 5 acres of land. Shading from trees or adjacent buildings which would prevent the solar panels from working effectively.
Planning	Planning designations (greenbelt, Area of Outstanding Natural Beauty (AONB) etc). Sites allocated for housing – local plan Proximity to housing – we would recommend at least 300m. Potential loss of amenity either through loss of established public use of a site. Transport and access constraints. Other development issues such as flooding, proximity to historic buildings, complex ecology etc.

Risk Category	Action and Information Sources
Land	Agricultural land grade 3b or below. Indicative land grade is provided by Natural England . (http://publications.naturalengland.org.uk/category/5954148537204736). Land ownership including underlying interests and covenants, tenancies etc – Land Registry and deed packets Does the land have direct access to the public highway? Suitability of ground conditions and ground contamination/ stability.
Grid	Available and affordable grid connection capacity for the export of power generated

We have examined a range of land holdings including 35 historic landfill sites across the city. Many of these closed landfill sites have been reclaimed as open space (for example, Clayton Vale and Tweedle Common) or are not suitable for development as a result of location issues where adjacent land uses effectively rule out development (also see Appendix 4). For example, Shack Liffe Green is nestled between the houses of Horncastle Road and Boggart Hole Clough Park. The site has received minimal intervention and as a result now has a very diverse habitat with ecological value.

We also identified potential opportunities for solar PV at Heaton Park and on Council owned land south of Wythenshawe Hospital. Further investigation of these sites suggests that there are issues which would prevent them providing solar PV capacity as follows:

- Heaton Park is a large, historic, Grade II listed municipal park and reservoir, containing a number of historic structures dating from its original use as a country estate. It is used for a mix of formal and informal recreational opportunities in a primarily informal landscape. Heaton Park is a site of heritage value and as such a heritage impact assessment will be required to determine any potential harm or opportunities on the listed buildings within the setting. Heaton Park is also designated as a green belt area. At the time of writing, grid capacity of around 8 MW was the available in the vicinity of the site.

  Discussions with the Council's planning department has precluded a development of this scale due to the impact on heritage assets. As an alternative a significantly smaller solar carport project was considered, but again this is likely to be unsuitable in planning terms.

- The land south of Wythenshawe Hospital under is included within Allocations 11 and 46 for employment within the Greater Manchester Spatial Framework Publication Plan 2020. These allocations and supporting planning documents have been through extensive consultation and as such it would be very difficult to make representation to amend the allocations for a ground mounted solar scheme to be brought forward on the site. The plan is currently going through all ten Greater Manchester Combined Authority councils for approval. The consultation on the final plan is scheduled from 1 December 2020 to 26 January 2021.

There remains potential for up to 2 MW of solar PV on both the car park and roof areas at the site, however it is likely that this will be required by the eventual occupiers of the site.

Further investigation of the planning constraints associated with these assets suggest that **none of this will contribute** to the overall requirement as the sites are unsuitable in planning terms.

A review of planning applications within the Council's area over the last two years has not provided any potential third-party schemes within the Council's boundary.

1.6 Greater Manchester Combined Authority Sites

Other councils within the Greater Manchester Combined Authority area are also exploring potential opportunities for solar farm sites. The ground mounted projects planned include solar farms at Chamber House farm in Rochdale (5 MW) and Kenyon Way in Salford (1.7 MW). The size of these schemes are not large enough to necessitate a collaboration with the Council and we have not been able to identify any third party developments which could be acquired.

1.7 Market Schemes – UK wide opportunities

We have identified no additional potential for schemes within the Greater Manchester area.

As the Council's requirement cannot be met from within its own asset base it is likely to need to acquire assets from the open market or enter into a suitable PPA. Section 8 of this report sets out how the Council can position itself to be able to respond to market opportunities as they arise. It is most likely that schemes available to purchase will be onshore solar PV for the reasons set out in section 3.1.

There is a substantial pipeline of new solar PV projects in the UK, but many of these projects are either already owned by, or committed to, existing investors. There are two types of developers of solar PV assets in the UK, those who are part of or commercially attached to the major funds (e.g. Greencoat, BlackRock and Octopus Renewables), and those who fund their own developments and sell projects. This report has been produced following dialogue with developers who sell projects.

There are examples of local authorities successfully purchasing Low and Zero Carbon (LZC) most notably Warrington Borough Council who have acquired around 100 MW of solar PV and storage assets from Gridserve.

The solar development market has focused in recent years on the development of larger schemes, typically larger than 30 MW capacity and mostly concentrated just under 50 MW in size. These schemes are a good fit with the Council's overall requirement.

During the course of this process, Local Partnerships has identified three potentially suitable projects for the Council to review. Other schemes may become available over time and these schemes may no longer be available when the Council is in a position to act, so implementation of an asset purchase scenario is likely to require new market

intelligence. We are not able to disclose commercially sensitive information in relation to projects identified, so these have been anonymised for the purpose of this report.

1.7.1 Project A – North West – 30 MW

Project is in development. Grid and land rights appear to have been secured by the developer. Planning is yet to be submitted. Earliest energisation date Q4 2023. Community development company.

1.7.2 Project B – The Midlands – 45 MW

Project has grid and land rights secured. Planning consent has been granted for the scheme. This scheme has a grid connection at 132kV which will add some complexity. Opportunity to purchase post construction. Earliest energisation date Q1 2022. Commercial developer.

1.7.3 Project C – Southern England – 46 MW

Project has grid and land rights secured. Planning consent has been granted for the scheme. Earliest energisation date Q3 2021. Commercial developer.

There will be competition for the acquisition of these projects, and the Council cannot therefore be certain at this stage of securing a particular project. The purpose of this report is not to identify and secure a project, it is to develop the Council's understanding of what is required to meet its objectives and the extent to which that is possible. This will enable the Council to take the necessary decisions to put in place measures which would allow it to engage with projects and move at the speed that is likely to be necessary to secure project rights. This report therefore does not contain a specific recommendation to pursue any particular option.

1.8 PPA options

Renewable energy PPA's are available either through major electricity suppliers or direct with generating stations. These are generally on terms ranging from 8-15 years. Renewable energy PPAs have some risks in carbon accounting terms in relation to permanence as the arrangement can be easily reversed at the end of the contract period.

1.8.1 Electricity supplier green PPAs

For this report we have reviewed options available from npower (the Council's current electricity supplier). Under these arrangements the Council are able to source their power directly from an identified renewable energy generating station, with pricing tied to the particular technology.

Various pricing options are available ranging from a fixed price option to options indexed at either CPI or RPI.

In addition to the carbon accounting risk in relation to permanence PPAs with major suppliers are harder to justify in terms of additionality as most of the schemes listed would have entered into a PPA with a large electricity supplier regardless of the specific demand from one customer. There is also the possibility of being accused of 'green washing' as by allocating particular renewable energy generation to a specific customer

the supplier is potentially increasing the carbon intensity factor for electricity supplied to its other customer who are not on a specifically 100% renewable energy tariff.

1.8.2 Direct PPAs with generating stations

It is possible to procure electricity directly from a generating station, through either a sleeved or a synthetic PPA. Either of these arrangements is compliant in terms of carbon accounting.

Whilst the permanence argument remains in relation to carbon accounting the additionality argument is much stronger when taking this alternative.

1.9 Value for Money

A financial appraisal of each of the options was undertaken and compared to the current state (do nothing scenario) using a net present value (npv) calculation. This modelling was undertaken by Local Partnerships on behalf of the council and utilises third party data from Aurora Energy Research (Aurora). The outputs of this modelling are shown in Table 3.

Local Partnerships are subscribers to Aurora, who are a market leading provider of energy price forecast information. Using high quality forecast information for forward energy prices provides the council with the highest likelihood of a robust npv calculation. Aurora's information is the basis of their business and clients are tied with strict contractual terms that prevent the release of forecasts to non-subscribers. Local Partnership's agreement with Aurora allows them to use the information in financial modelling and to release the outputs of that modelling in a form where the original data cannot be reverse engineered, but not to release the financial models as these contain the embedded data sets. We have therefore included the assumptions for the financial modelling and the outputs of the npv calculations in this report.

Local Partnerships and Aurora have undertaken a workshop with council officers to ensure that the council understands the basis of the data and the financial models that produce the npv information used in this report."

Table 3: Outputs from NPV modelling

Manchester City Council Scenario Comparisons (February 2021)

			Total Cost (25 yrs)	Cost after 8 years	25 year npv	8 year npv
	With sleeved PPAs					
1.	Do Nothing (assumes Aurora wholesale plus inflation)		-£85,558,054	-£21,965,089	-£43,366,132	-£17,091,133
2.	Fair Value Solar PPA Option	V Do Nothing	£15,808,392	£2,593,361	£7,235,495	£1,966,242
3.	Fair Value Wind PPA Option	V Do Nothing	£22,385,253	£5,528,952	£11,169,161	£4,258,268
4.	Solar Own/Operate Option Site 1 (southern England)					
4. a)	Solar own and operate with 25 year finance (southern England)	V Do Nothing	£22,017,266	£3,055,525	£9,977,925	£2,207,730
4. b)	Solar own and operate with 35 year finance (southern England)	V Do Nothing	£30,147,626	£5,765,645	£14,403,842	£4,347,664
5.	Solar Own/Operate Option Site 2 (the Midlands)					
5. a)	Solar own and operate with 25 year finance (the Midlands)	V Do Nothing	£20,225,002	£1,081,277	£8,263,154	£629,010
5. b)	Solar own and operate with 35 year finance (the Midlands)	V Do Nothing	£28,230,442	£3,749,757	£12,621,068	£2,736,065
6.	npower wind PPA (£48.50) indexation 2.0%	V Do Nothing	£20,089,059	£3,232,759	£9,293,783	£2,382,890
7.	npower solar PPA (£47.10) indexation 2.0%	V Do Nothing	£16,988,517	£3,773,486	£8,076,710	£2,807,458

From the table it is clear that all options represent value for money in relation to 'do nothing' and there is therefore a compelling reason to act.

Over a 25 year operation period both the asset acquisition options offer good value for money. If a shorter 8 year time horizon is considered then the a fair value (direct) PPA

with a third party or an asset acquisition of a site in southern England represent best value.

Recommendation 2: All options have positive NPV outcomes when compared with 'do nothing'. There is therefore a solid value for money basis to either enter into a suitable PPA or asset purchase agreement.

1.10 Options Appraisal

Four scenarios were taken forward into the options appraisal. These represented the best value alternatives from the NPV comparison exercise and include:

1. nPower wind PPA
2. Fair price wind PPA (direct with a generator)
3. An asset purchase of the site in southern England
4. An asset purchase of the site in the Midlands.

A total of seventeen criteria based around desirability, feasibility and viability were agreed with the Council and each option was scored against the criteria. Detail of this process can be found in section 10 and Appendix 5.
The output scoring from the options appraisal is set out in table 4.

Table 4: Options appraisal scoring

Option	Description	Score	Rank
1.	**nPower wind PPA.** A wind based PPA with nPower (current electricity supplier) linked to specific projects. This is for an 8 year duration and pricing has been obtained from nPower.	61%	4
2.	**Fair Price Wind.** A wind based PPA direct with a turbine operator. This assumes an 8 year duration with pricing based around the Aurora Energy Research fair pricing model.	72%	2=
3.	**Asset Purchase (Southern England).** An asset purchase of a 49 MW solar farm post construction. The farm is based in southern England and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.	80%	1
4.	**Asset Purchase (The Midlands).** An asset purchase of a 46 MW solar farm pre-construction. The farm is based in the Midlands and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.	73%	2=

From the options appraisal it can be seen that the purchase of a site in southern England represents both the best value for money and the best fit with the Council's objectives. There is little to choose between an asset purchase in central England and direct wind PPA.

1.11 Preferred option and PWLB risk

In November 2020 the Government published its response to a consultation on Public Works Loan Board (PWLB) lending terms. The consultation was aimed directly at preventing local authorities borrowing for projects which were purely or largely for yield and contained a specific note around investments being in the local economic area.

The asset purchase options are not in the Council's local economic area and it is highly unlikely that a suitable asset will ever become available in the Council's economic area. Furthermore, if investment in renewable energy generation is allowable (and within the local area it appears to be), then local authorities in the north of England are at a disadvantage to those in the south as irradiance levels (and therefore carbon saved and cost savings per £ spent) are less.

Before the Council can decide whether or not an asset purchase is its preferred option it needs to establish with HM Treasury whether or not it is permitted to make this investment under the new PWLB lending criteria.

Recommendation 3: Having undertaken a thorough options appraisal exercise the Council is now able to articulate that asset purchase is a value for money option to achieve their carbon targets and should now explore with HM Treasury whether or not an asset purchase would be compliant with PWLB lending terms.

1.12 No regrets actions and next steps

In order to deliver the strategy of reducing emissions by 7,000 tCO_2e by 2025, the Council will need to determine its preferred way forward. In order to do that the following are recommended:

1. Develop an understanding of the likely future requirements for electricity over the next decade. This should provide a view as to the likely overall requirements and the degree of certainty which could be attached to this forecast. In all scenarios there is a benefit in having reliable information on which to base assumptions.

2. Follow up established conversations in relation to the use of PWLB to ascertain whether an out of area asset purchase would be allowable under the new prudential regime.

If the Council determines that it wants to pursue an asset purchase strategy, then it will need to put in place measures to allow it to implement that strategy including:

3. Establishing sufficient delegated decision-making powers to allow the Council to enter into an exclusivity agreement with a developer and invest in the necessary due diligence work to determine whether a project is a viable prospect.

4. Establish a supplier base to facilitate the due diligence work including technical specialists and lawyers.

5. Develop its financial and carbon modelling to ensure that all costs and benefits for a particular project are understood.

6. Determine whether or not to proceed further with due diligence in relation to any of the large-scale projects identified.

If the Council determines that it wants to pursue a PPA strategy, then it will need to put in place the following:

7. A clear policy in relation to carbon accounting, tested with the Council's advisors in this area, setting out how additionality, permanence and traceability will need to be demonstrated by any procurement.

8. A suitable procurement for a direct 'fair value' PPA agreement.

2 Methodology

2.1 Site Generation Hierarchy

This report has been developed with reference to the methodology set out below.

1. Express the carbon reduction target in terms of renewable energy generation capacity. Review overall Council electricity consumption and combine the two to provide an overall renewable energy target that achieves a 7,000t CO2e reduction in 2025.

2. Review Council owned assets to ascertain how much renewable energy generation could be accommodated on Council owned assets, in addition to that already identified. This took the form of a desk-based review of suitability from an asset list supplied by the Council and references land, planning and grid connection constraints.

3. Once the Council's own estate has been exhausted, look for other opportunities in the Greater Manchester Combined Authority area with other public sector bodies. These opportunities were highlighted by the Council and reviewed on a similar basis to the asset review.

4. Third party schemes in the Council area were searched for through the planning registers, although no suitable schemes were identified as having been submitted for planning within the last two years.

5. Look for surplus generation capacity in the open market to fulfil any shortfall in relation to capacity. This was done by direct approaches to renewable energy developers known to sell projects and project rights on the open market. Local Partnerships has Non-Disclosure Agreements (NDAs) with these developers which allows us to provide anonymised data to the Council (who do not currently have an NDA). Three projects were identified through this process (see section 8.10). These sites have not been subject to due diligence and the information provided in the term sheets has been used to generate the information for the report.

6. Review available PPA alternatives. This took the form of dialogue with Aurora Energy Research to gain market insights and intelligence and a meeting with the Council's current energy supplier nPower to discuss alternatives they could offer.

The schemes in section 8.10 have also been subject to outline financial appraisal to ensure the Council has a broad understanding of scheme economics.

2.2 Key Considerations

The options are quite different in their approach, in order to analyse them further the following considered:

1. Is the size of the scheme a match with the Council's requirements

2. Work required by the Council to deliver the scheme

3. Timing – likely date of first generation
4. Irradiation
5. Potential for community involvement
6. Risks
7. Carbon benefits (a function of size, irradiation and timing)
8. Investment criteria (a function of size, irradiation, capital cost and Power Purchase Agreement (PPA) assumptions).

To assist the Council in understanding the different characteristics, we have run workshops with key personnel to cover each of the topics in detail and to provide the opportunity for assumptions to be explored and risks to be analysed. Further information in relation to PPAs, subsidy and price support mechanisms are found in Appendix 1.

The approach taken to the acquisition or development of schemes will also have risk and procurement implications. To assist in the understanding of this further information is provided in Appendix 2 in relation to procurement.

3 Sizing the Council's renewable energy generation requirement

3.1 Background

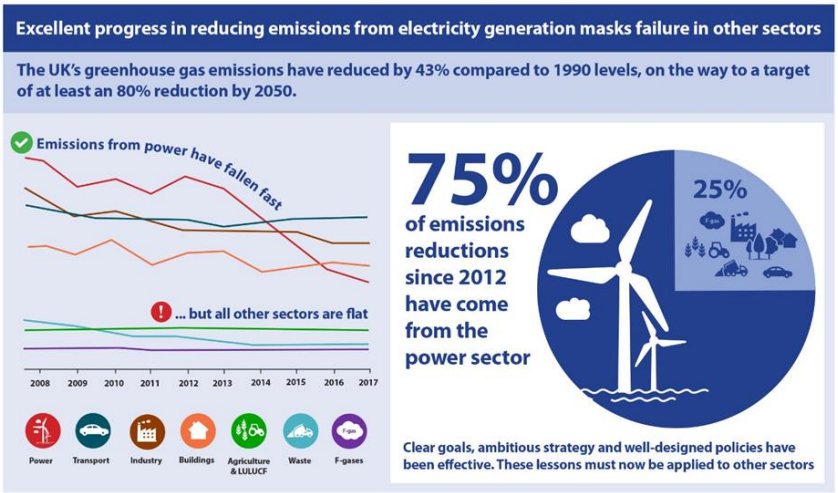
The Council has declared a climate emergency and set a science-based target to be zero carbon by 2038. It has already reduced its direct emissions by 48% from a 2009/10 baseline. Ongoing work to reduce emissions further is set out within the Council's Climate Change Action Plan (CCAP) for 2020-25. The CCAP includes a target to halve emissions again within this 5-year period and sets a carbon budget for the period too.

Work is underway across several different strands to meet these emission reduction targets – from improving the energy efficiency of street lighting to decarbonizing heat within the estate and investing in large scale renewable energy generation capacity. In October this year, Local Partnerships was appointed to carry out a feasibility study to investigate options for large-scale renewable energy generation - in line with Action 1.4 of the CCAP which sets a target to reduce CO_2 emissions by 7,000 t pa.

3.2 Grid decarbonisation

The UK has seen rapid decarbonisation of its electricity supply over the last eight years. Figure 3, produced by the Committee on Climate Change, sets out the progress towards decarbonisation made by the main sectors of the economy since 2012.

Figure 3: UK progress towards decarbonisation[2]



The UK Government has committed the UK to be a net zero emitter of greenhouse gases (GHG) by 2050. In order to achieve this commitment, decarbonisation of electricity generation will be a pre-requisite. The UK has continued to make progress with deployment of renewable energy and there are a number of measures in place (or in the

[2] Source: Committee on Climate Change 2018 progress report to Parliament – June 2018

pipeline) that should provide confidence that grid decarbonisation is likely to continue for the foreseeable future. These measures include:

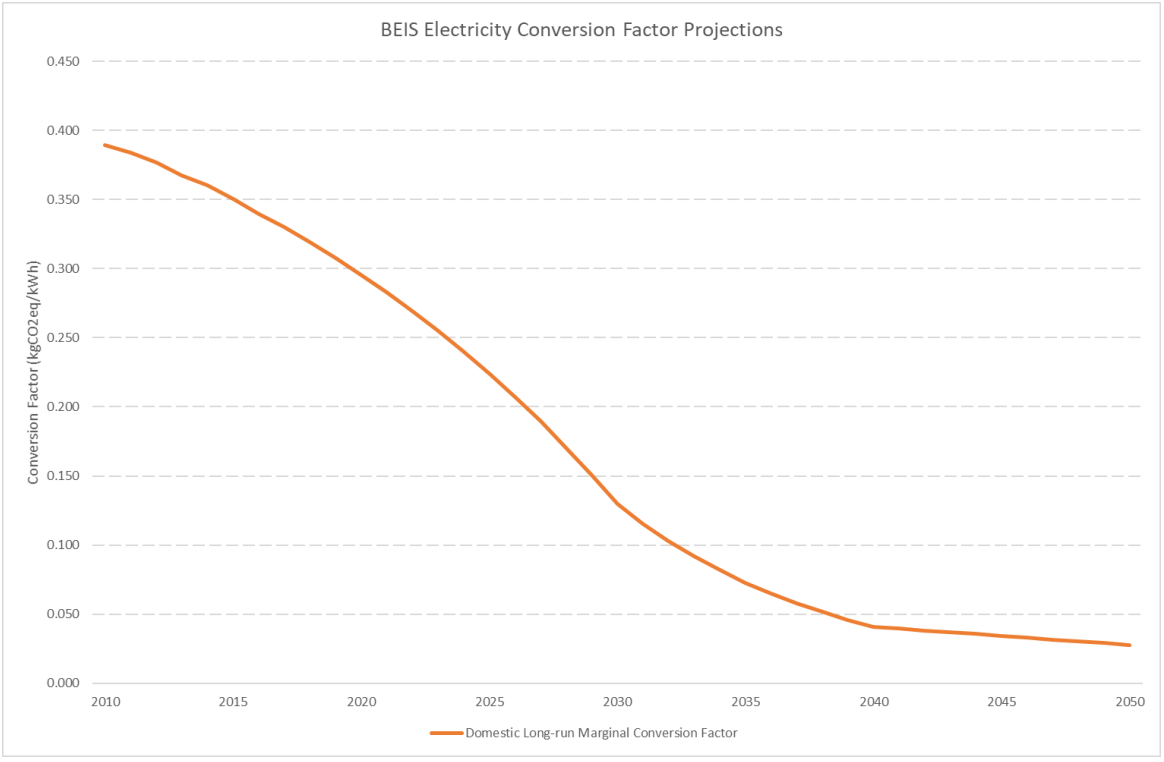
1. Offshore wind sector deal – aiming to triple current capacity to 30 GW by 2030. A further commitment to increase this to 40 GW by 2030 was included in the ten-point plan for a 'Green Industrial Revolution' made in November 2020[3].

2. Introduction of the Smart Export Guarantee Scheme – guaranteeing both an export market and a positive tariff at all times for small generators under 5MW.

3. Announcement that there will be a 12 GW allocation for mature technologies in the next round of Contract for Difference Auctions in late 2021. This in effect provides a mechanism for price guarantees for both onshore wind and solar PV schemes that are successful in the auction.

UK Government forecasts for the carbon intensity of the electricity supply were last produced by the Department of Energy and Climate Change in 2010. Decarbonisation has been happening at a rate slightly quicker than the forecast figures. The future forecasts are shown at Figure 4.

Figure 4: Forecast for electricity grid decarbonisation 2010-2050



Grid decarbonisation looks set to continue, but the rates of decarbonisation are likely to be less pronounced as almost all coal fired power stations have already been removed from the generation mix. In order to achieve net zero by 2050 the UK will have to increase its supply of renewable energy to around four times current levels. This is to allow for the removal of the gas fired power stations from the generation mix. These

3 The ten point plan for a green industrial revolution - GOV.UK

forecasts are now ten years old and current rates of grid decarbonisation are running approximately 13.5% ahead of the forecast figures.

3.1 Renewable energy technology selection

Solar PV and wind turbines represent the best value for money in UK renewable energy technology installations. There may be some small opportunities to generate power from other technologies, however the returns on investment are generally lower. We have not been made aware of any specific opportunities the Council has in relation to other technologies.

Development of new onshore wind turbines in England and Wales has been problematic since the introduction of new planning criteria in 2016 (see section 6.1), with the result that almost no new onshore wind capacity has been delivered in England or Wales in the last five years. Most new onshore turbines are in Scotland. Schemes in Scotland run the risk in the event of devolution that the Council has an investment outside of the country in which it is located. These schemes are also normally developed directly for investors and rarely come to the market. For these reasons it is considered unlikely that an onshore wind scheme would meet the Councils' requirements.

The Crown Estate is currently in the process of running its fourth leasing round, creating the opportunity for at least 7 GW of new offshore wind projects (see section 7.1). The Round 4 leasing process consists of five stages, the pre-qualification stage of which has already been completed. It is currently anticipated that Round 4 projects will become operational towards 2030. The size and delivery timing for offshore wind assets makes them unlikely to be a good fit with the Council's requirement.

These constraints, coupled with the largely urban nature of the Council's area, mean that our analysis for development or acquisition projects has focused on solar PV which represents the most realistic and affordable opportunities to meet the requirement. However, where a scheme may be improved by the incorporation of on-site storage then commentary on this has been provided.

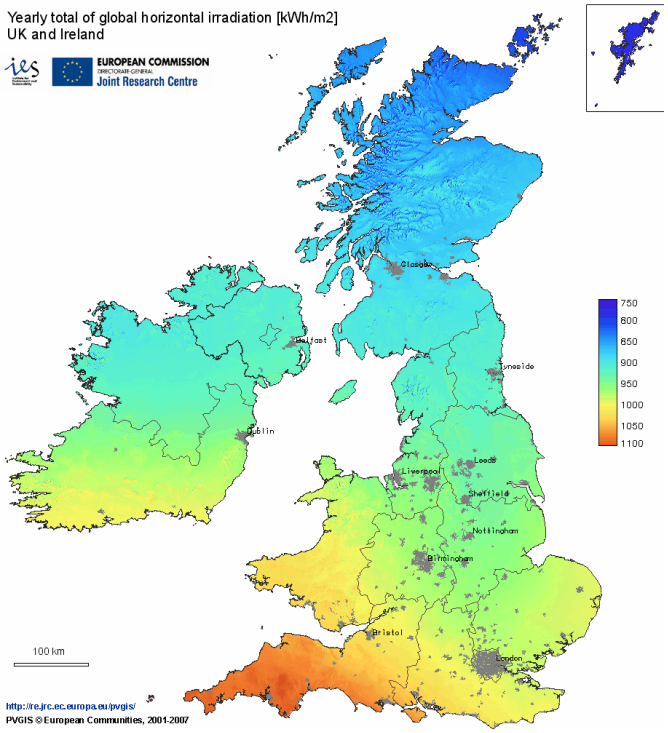
PPA options have also considered wind projects, although these are likely to be located in Scotland or offshore.

3.2 Calculating the appropriate size of a solar PV scheme to meet existing targets

The original brief was to offset 7,000 tCO_2e in 2025. Figure 3 shows that the carbon intensity of grid supplied electricity falls from 0.224 Kg CO_2e/kWh in 2025 to 0.052 Kg CO_2e/kWh in 2038. The Council's offsetting requirement also falls during the period 2025 – 2038, with a residual requirement in 2038 of 2,913 tCO_2e. We have therefore calculated the equivalent solar PV requirement for both 2025 and 2038.

The other significant variable in calculating the size of the requirement is solar irradiance. Irradiance varies across the UK and significantly affects project economics, as higher irradiance is in effect free fuel. Figure 5 on page 16 shows irradiance levels across the UK. As it is not yet known where any potential scheme might be located we have assumed a generic figure of 945 kWh/kWp of installed solar PV in our calculations, which is similar to the figure in Manchester. Schemes in southern England may have significantly higher levels of irradiation.

Figure 5 – UK solar irradiance levels (Source PVGIS)



3.2.1 Solar equivalent sizing - 2025

By 2025 grid supplied electricity is forecast by BEIS to have a carbon intensity factor of 0.224 Kg/ kWh.

Converting the **7,000-tonne requirement** into the equivalent grid supplied electricity can be done as follows:

1 Kg/kWh = 1 tonne/ MWh therefore:

7,000 tonnes/ 0.224 = 31,250 MWh of grid supplied electricity equivalent

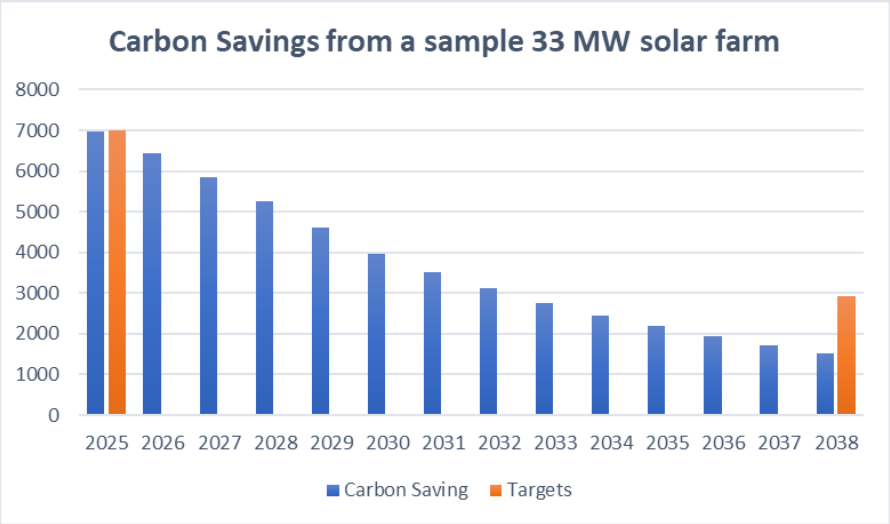
The projected irradiance for Manchester is in the region of 945 kwh/kwp[4].
For the requirement to be met by locally produced solar PV in 2025 the Council would therefore need:

31,250 x 1,000 (conversion MWh to kWh) / 945 = 33,069 kWp or the equivalent of around **33 MW solar.**

Figure 6 sets out how a 33 MW solar farm, sized to meet the 2025 target would fall short of the 2038 target.

[4] PVGIS Version 5 - CMSAF

Figure 6: Carbon savings from a 33 MW solar farm against targets



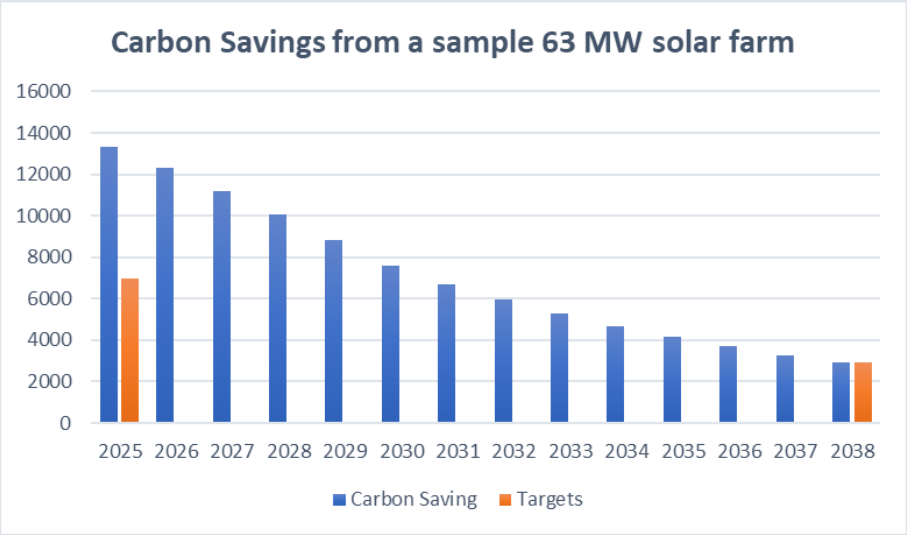
3.2.2 Solar equivalent sizing – 2038

By 2028 grid supplied electricity is forecast by BEIS to have a carbon intensity factor of 0.052 Kg/ kWh.

Following the same methodology set out above, but also allowing for the 0.4% annual degredation the 2038 **2,913-tonne requirement** is equivalent to a 63 MW solar requirement in the Manchester area.

Figure 7 sets out the carbon savings from 63 MW of solar against the targets in 2025 and 2038.

Figure 7: Carbon savings from a 63 MW solar farm against targets



3.2.3 Sizing by electrical consumption

The Council will only be able to offset emissions from electricity generation against it's electricity consumption (i.e. scope 2 emissions). In setting a target requirement we therefore also need to consider the future consumption of electricity by the Council. 2018/19 electricity consumption was around 49GWh (excluding schools). A further 4GWh/pa reductions are forecast from the street lighting programme, leaving a residual requirement of around 45 GWh/pa.

There is considerable uncertainty around future levels of consumption. The Council have ongoing energy efficiency programmes and will potentially also review their estates requirement following a year of homeworking through the Covid-19 lockdowns. These measures may see a significant decrease in electricity consumption, although analysis of previous years trends suggests that aside from the street lighting programme the Council has achieved year on year energy efficiency savings or around 2%.

Set against this the Council will need to use electricity for more things in the future if it is going to remove its scope 1 emissions (i.e. petrol, diesel and gas). It is likely that much of the fleet will need to be electrified and heating systems will require more electricity in the future.

45 GWh in 2038 would represent around 2,088 tCO2e in 2038. This is less than the 2,913 tCO2e identified in earlier work, and therefore assumes that the Council will achieve greater energy efficiency savings that previously identified.

Bearing in mind the uncertainty over electricity consumption we have used the 45 GWh/pa in the remainder of this report and focused on flexibility in our assessment of different alternatives.

At an irradiance level of 945 kwh/kwp (see section 3.2.1 for further details on methodology) the annual consumption would equate to around 47.6 MW of solar PV.

3.3 Carbon Accounting Practice

The Council will be able to account for the electricity produced from the renewable energy generators against its scope 2 emissions. These are the emission produced by the consumption of grid supplied electricity. It is not possible to use renewable energy generation to offset against scope 1 emissions in the UK.

Recommended practice in the UK is for organisations to undertake dual accounting for the use or generation of renewable energy. Under this methodology the initial assessment is undertaken using grid supplied electricity and then an adjustment is shown 'below the line' for the renewable energy. In this way it is possible to retain visibility over both total consumption of electricity (and the success or otherwise of energy efficiency measures) and the use of carbon.

In order for renewable energy to be reliably used in carbon accounting it is necessary to consider three things:

1. Whether or not the use of renewable energy directly contributes to additional renewable energy resource in the UK. Any scheme which would have gone ahead regardless of the arrangement should not be included in carbon

accounting measures. In particular the Council should be wary of supplies which are part of much wider arrangements where the allocation of a project to a particular customer would lead to the general supply for customers not on a 'green' tariff having a higher carbon intensity.

2. Permanence of the arrangement. Any initiative which can easily be reversed eg if budget cuts are required should not be included in carbon accounting measures.

3. Traceability. This means the extent to which it is possible to be certain that the electricity purchased has been generated at the point specified. This is governed in the UK by the Renewable Energy Generation of Origin (REGO) certifictes, a scheme which is administered by OFGEM. For the purposes of the remainder of this report it is assumed that all schemes will be able to provide suitable REGO certificates.

3.4 Size range and target size

The 2025 target requires a solar farm of around 33 MW, whereas to meet the 2038 target a much larger 63 MW solar farm would be required. These are both assuming an irradiance of 945 kWh/ kWp (Manchester area). If a suitable project could be found in an area with 10% higher irradiance, then the requirement would fall by the same amount.

If a larger project was selected, then it would meet the 2025 requirement and potentially the 2038 residual emissions target. A larger scheme would also have the benefit of contributing more to the earlier carbon budgets.

In order to contribute to CO2e reductions a scheme will have to be no larger than the Council's equivalent scope 2 emissions. We would therefore recommend that the correct size for the requirement is in the order of 45 MW – 50 MW of solar PV.

Recommendation 1: The Council should consider adopting a target of 45-50 MW of solar PV generation (or equivalent wind) now as this will:

a) Provide a future proof solution which will also deal with residual emissions in 2038.

b) Allow a larger proportion of the Council's scope 2 electricity emissions to be reduced from an earlier point in time. This will help the Council in achieving its carbon budget target.

c) Maximise the potential of offsetting through generation or power purchase.

Background – Key Points

The report sets out a requirement for the equivalent of 45-50 MW of solar PV.

Solar PV projects are more realistic than wind turbines due to planning restrictions.

4 Review of ground mounted solar PV opportunities on land assets owned by the Council

4.1 Overview

The use of large-scale ground mounted solar has been popular in the UK and represents around two thirds of the UK's overall installed solar capacity. Ground mounted solar PV schemes need scale to be cost effective as investment yields are typically relatively low (<6%).

Land recovered from former landfill activities can be used for ground mounted PV systems, but this increases the costs as mounting structures need to be surface mounted (as opposed to piled into the ground). It is also possible to install floating solar arrays on reservoirs, although these schemes are more expensive.

The requirement identified in section 3.4 will require in excess of 100 Ha of land to achieve. Our analysis (see Appendix 4) concludes that the Council has limited scope for ground-mounted solar that merit further investigation. The Council currently holds land interests at 35 historic landfill sites across the City. Many of these closed landfill sites have been reclaimed as open space (for example, Clayton Vale and Tweedle Common) or are not suitable for development as a result of location issues where adjacent land uses effectively rule out development. For example, Shack Liffe Green is nestled between the houses of Horncastle Road and Boggart Hole Clough Park. The site has received minimal intervention and as a result now has a very diverse habitat with ecological value.

Potential opportunities for solar PV exist at Heaton Park and on Council owned land south of Wythenshawe Hospital (see sections 4.4 and 4.5), however planning and other designations mean that these sites cannot realistically be brought forward for solar PV.

4.2 Development of ground-mounted solar PV schemes

In progressing ground mounted solar schemes on its own sites, the Council will need to consider the best approach to take to managing the development process. Detailed guidance on this can be found at Renewable Energy Good Practice guidance for the LGA.

Working with a third party brings skills and potential development finance but will require the benefits to be shared and a procurement will be necessary.

In this analysis we have not contemplated the Council developing sites on third party land as this would require the identification of suitable sites before any appraisal could take place. If the concept of ownership of large-scale ground mounted solar PV projects is agreeable this alternative could be considered as a potential delivery route, although it is resource intensive and carries significant development risk. Under the Prudential Code, local authorities cannot borrow from the PWLB or any other lender for speculative purposes.

The options for development of schemes on Council owned land are:

1. The Council acts as developer by directly managing the grid connection application and the submission of the planning application – this approach will maximise the financial benefits but carries the greatest risk in terms of development finance and failure to develop. The approach will require staff capacity and capability to manage the process.

2. Partnering with a solar developer who would take on some of the project risk. Given the relatively small size of the pipeline and the complexity of the procurement exercise that would be required, this route would be unlikely to provide best value.

3. Energy performance contracting – this approach uses a framework to appoint a suitable contractor who will then work up the scheme and manage the development process. Costs are incurred by the Councils for the development work, but financial returns are guaranteed.

4.3 Elements of development

Table 5 below sets out the initial screening tests that have been applied to Council owned sites in assessing their suitability to host solar PV projects.

Table 5 – screening tests for potential projects – Solar PV

Risk Category	Action and Information Sources
Viability	Size and orientation. For a scheme to offer sufficient financial return on investment to pay for a grid connection it is likely to need to be > 1MW. A site of this size would require 5 acres of land. Shading from trees or adjacent buildings which would prevent the solar panels from working effectively.
Planning	Planning designations (greenbelt, Area of Outstanding Natural Beauty (AONB) etc). Sites allocated for housing – local plan Proximity to housing – we would recommend at least 300m. Potential loss of amenity either through loss of established public use of a site. Transport and access constraints. Other development issues such as flooding, proximity to historic buildings, complex ecology etc.

Risk Category	Action and Information Sources
Land	Agricultural land grade 3b or below. Indicative land grade is provided by Natural England . (http://publications.naturalengland.org.uk/category/5954148537204736). Land ownership including underlying interests and covenants, tenancies etc – Land Registry and deed packets Does the land have direct access to the public highway? Suitability of ground conditions and ground contamination/ stability.
Grid	Available and affordable grid connection capacity for the export of power generated

There are three basic elements for developing a solar farm; land rights, grid connection and planning.

4.3.1 Land rights

The schemes we have reviewed are on land owned by the Council. There are, however, other land considerations which any scheme would need to we have reviewed are on land owned by the Council. consider. These are as follows:

1. Any leases, licences, covenants or other rights over the land.

2. Any third-party land rights which will be needed to lay a cable between the site and the point of connection identified by the electricity grid network operator Electricity North West (ENW).

3. Any alternative uses for the land which the Council may have and whether a solar farm represents the optimum use of scarce resources.

4.3.2 Grid connection

In order for any scheme to work it needs access to a grid connection. This needs to be at a suitable scale and affordable cost. Grid access is provided by the local network operator via a formal process of a grid application. Prior to the grid application, informal advice can be sought either via surgeries or via a ‘budget estimate’ process. These informal processes are helpful, but do not provide certainty either in terms of price or guarantee that a connection will be available when required. The grid offer process takes around 65 working days and involves an up-front cost (of the order of £2,000 per site).

Types of grid connection offer

ENW grid connection offers provide two alternative prices; one is for ENW to undertake all connection works i.e. from the project site on to their network (usually known as ‘all works’ offer). The second offer is for ENW to undertake only those works on the network which others are not allowed to undertake (for example upgrading their transformers to facilitate the connection).

This second type of offer is known as a Competition in Connections (CIC) offer. This form of offer is likely to be cheaper but will require the procurement of an Independent Connection Provider (ICP) to undertake the remainder of the works. Developers typically pursue the use of an ICP for the following reasons:

- Greater choice
- Greater flexibility
- Faster delivery
- It can be more cost effective
- They are more likely to use language you understand and have knowledge from other projects, especially where dialogue with ENW is required to optimise the connection.

Greater efficiencies and economies of scale (cable and staffing costs) are more prevalent on longer connections. From our experience, ENW are very conservative on programme timescales resulting in higher contractor's costs (for weekly site establishment and management) in comparison to ICPs who typically drive the shortest and most efficient programme of works.

If the Council decided to accept a CIC offer, then it would require either the procurement of an ICP or for the ICP works to be procured as part of the solar farm construction contract. This may add to the complexity of procurement activities. Further complexities arise through the need for the cable route to be included in the planning submission (ENW has permitted development rights which do not extend to the CIC contractors) and the management of road opening licences (which will normally be managed by the ICP).

4.3.3 Planning

Information to submit a planning application for large scale solar PV usually takes around six months to collate and three months to determine.

Key planning considerations generally include:

- Landscape and visual impact/amenity impact
- Ecology
- Transport, construction and noise
- Glint and glare
- Rights of way
- Flood risk
- Specific local policy designations and constraints

Planning for renewable energy schemes does carry an inherent level of risk.

Biodiversity net gain (BNG) is an increasingly prevalent requirement in planning decisions. This will become mandatory under the forthcoming Environment Bill. Any planning submission is likely to be required to demonstrate a 10% gain under the legislation, using the recently issued metric from the Department for Environment, Food and Rural Affairs (DEFRA).

Local buy-in to any scheme will be important in the urban area. There are instances where buy-in has been enhanced by working with community development groups or offering Community Municipal Investments (CMIs). The Council could consider using a

CMI as an alternative to, or alongside the Public Works Loan Board (PWLB) to fund the schemes.

For example, West Berkshire Council has looked to tackle its climate emergency by investing in its first CMIs. The Council offered residents and community groups an opportunity to invest directly with them to help build a greener future for the district. The council was seeking to raise £1 million to fund new rooftop solar power on council-owned buildings around West Berkshire. The CMI successfully closed reaching its £1m target five days ahead of the proposed deadline, attracting 640 investors who each invested an average of around £1,500. Similarly, Warrington Borough Council launched a CMI bond to raise £1m to help finance the construction of a solar farm near Cirencester and its co-located battery storage facility (a 24 MW hybrid project).

4.4 Heaton Park

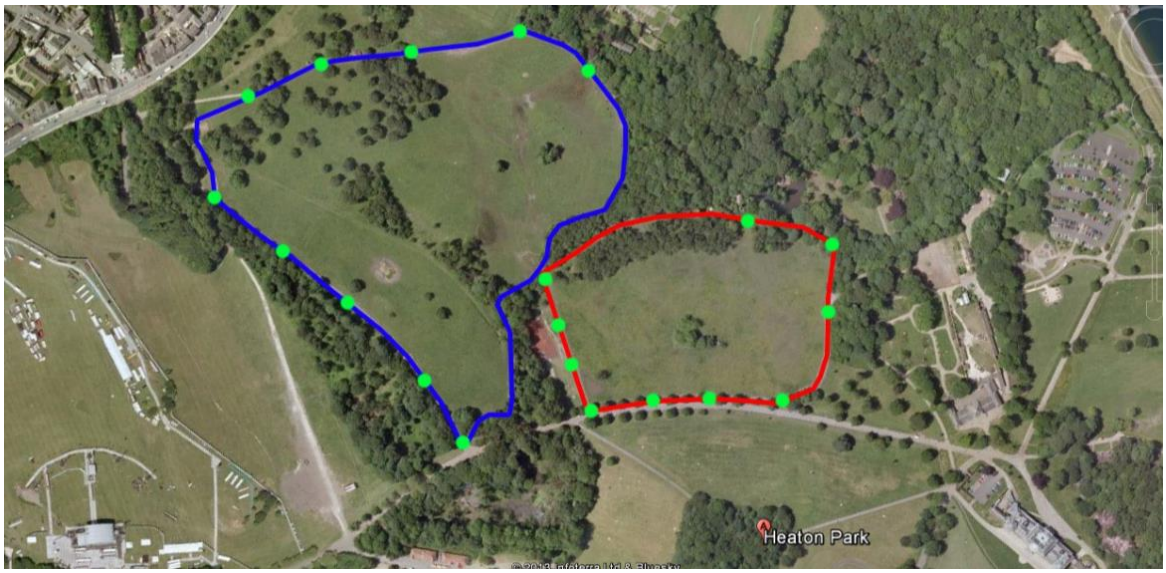
This is a desk-based analysis based on information that can be gained from websites, Google Earth and other electronic media. A site visit has not been undertaken by Local Partnerships as part of this assessment.

4.4.1 Site description

Heaton Park is a large, historic, Grade II listed municipal park, containing a number of historic structures dating from its original use as a country estate. It is used for a mix of formal and informal recreational opportunities in a primarily informal landscape.

The Council's Re:fit Service Provider, Ameresco, has identified two land parcels within Heaton Park as having potential for solar PV (see Figure 8). The area shown in red is approximately 4 Ha in size and at its closest point is 230m from Heaton Hall and orangery. There is a cluster of trees in the centre of the land parcel. The land is bounded by a tree lined perimeter path which forms part of a wider path network. Ameresco has indicated that the land parcel could support a 3.9 MWp solar PV scheme.

Figure 8: Potential land parcels for PV development at Heaton Park



The area shown in blue is a larger land parcel (circa 10.5 Ha) which is undulating with a gradual slope to a peak of mature trees. The land parcel is bounded by a tree lined

perimeter path which provides screening from Heaton Hall. There are three football pitches adjacent to the site. At its closest point the land is 510m from Heaton Hall.

Installation of a solar farm on the site would require considerable removal of trees. Consideration will also need be given to the existing site contours as it is likely that some levelling works would be required to facilitate the development of a solar panel array. Ameresco has indicated that the land parcel could support a 6.5 MWp solar PV scheme.

4.4.2 Planning

Key planning and design constraints for the site include:

1. Cultural Heritage and listing
2. Tree belts
3. Greenbelt
4. Nature and biodiversity considerations
5. Leisure and open space policies

The significance of Heaton Park, both as a heritage asset and a recreational resource mean that it is unlikely that any significant scheme could be brought forward at the site without significant harm.

Installing solar carports is becoming increasing popular for local authorities looking to generate renewable energy, and whilst it remains an expensive method of solar PV construction, a solar carport project at Heaton Park could provide the Council with the opportunity to generate renewable energy on the site whilst protecting the setting of the park. Ameresco has outlined a potential 500 kW scheme for one of the main car parks at Heaton Park. The Council recently obtained planning permission for a 915 kWp Solar carport at the National Cycling Centre, so is familiar with the technology. Discussion with the Council's planning department suggest that even a scheme of this size would not be suitable in planning terms.

United Utilities own the reservoir, meaning even if a floating solar scheme were possible in planning terms it would not be available to the Council.

4.4.3 Grid

A connections surgery call took place with ENW on 11 November 2020 to understand connections and capacity available in the vicinity of the site. An 11kV firm connection to support up to 8 MW of export was available circa 3.5km from the site. A budget connection cost was also provided by ENW, although firm costs will not be available until a formal offer is applied for and analysis of the connection route is completed.

4.4.4 Heaton Park Potential

The feedback from the Council's planning department means it is unlikely that any scheme could be brought forward at Heaton Park.

4.5 Land south of Wythenshawe Hospital

4.5.1 Site description

The land area under consideration (13.8 Ha) for a solar farm is located in the far south of Manchester, a short distance to the south of Wythenshawe Hospital. The area is bordered by Fairywell Brook to the southwest, which also forms the border with Trafford; by Dobbinetts Lane to the northwest; by a surface car park to the north; and, by Floats Road / Barnacre Avenue / Newall Road / Whitecarr Lane to the east and southeast.

4.5.2 Planning

The land under consideration is included within Allocations 11 and 46 within the Greater Manchester Spatial Framework Publication Plan 2020. The site has been allocated to provide around 2,400 high quality homes along with 60,000 square metres of employment land to provide high quality office space. These allocations and supporting planning documents have been through extensive consultation and as such it would be difficult to make representation to amend the allocations and therefore for a ground mounted solar scheme to be brought forward on the site. There is however the potential to target up to 2MW of solar car ports and rooftop solar as the site is developed.

4.5.3 Grid

A connections surgery call took place with ENW on 4 November 2020 to understand connections and capacity available in the vicinity of the site. ENW outlined that a firm connection to support up to 10 MWA of export was available circa 1.9km from the site (Green Lane (Altrincham) (33 kV / 11 kV)). The Council could also consider a private wire connection to provide a renewable energy supply to Wythenshawe Hospital.

4.5.4 Private Wire Connections

The term ‘private wire’ is used to describe a connection made directly to a customer’s premises. Private wires can significantly enhance investment yields as the customer avoids paying the network distribution charges for grid supplied electricity, which typically constitute around two thirds of their bill. This leaves scope for a higher price (relative to the wholesale price alternative) to be charged to the customer for the power supplied, whilst still representing a significant cost saving to the customer.

Further advice would need to be sought on the impact of any private wire connections in relation to carbon accounting practice and whether there would be any allowable reductions under this type of arrangement if the Council is not the customer.

4.5.5 Land to the south of Wythenshawe Hospital potential

As the land has been allocated for employment use it is very unlikely that it would come forward as a solar farm. There is however scope for up to 2 MW of solar (a combination of rooftop and carports). There is no certainty that the Council would act as developer and landlord at the site, so it may lose control of any solar potential through the development process. The economics of any scheme located on the site would be much improved by a ‘private wire’ direct to the occupiers. We therefore consider it unlikely that

any generation at this location would be utilised towards the Council's target and have discounted it form further analysis.

Ground Mounted Solar PV – Key Points

Our analysis has failed to find any significant sites with renewable energy generation potential which are under the Council's control and not already identified as part of the Council's existing programme for solar PV.

5 Battery Storage

5.1 Overview

Many councils have a diverse property portfolio which offers the opportunity to benefit from the growing demand for energy storage infrastructure. With recent advances in technology, falling costs and better regulation, local authority investment in this type of technology is becoming increasingly popular as a means of optimising existing assets and utilising renewable energy.

Battery storage systems do not provide direct carbon benefits, although they are required for the smooth operation of the electricity grid with the increasing prevalence of renewables. Standalone battery storage projects, unless the power is used by the Council, may be harder to justify as suitable for Public Works Loan Board (PWLB) funding.

Battery storage systems are becoming a popular addition to new and existing solar PV systems in a bid to increase the amount of self-consumption, mitigate against price cannibalisation risks and to reduce energy costs. For example, Exeter City Council is currently constructing a 1.2 MW ground mounted solar array co-located with energy storage technology, with a separate connection (private wire) to provide a renewable energy supply to its nearby operations depot.

Charging during daylight hours uses ‘free’ solar electricity and, if this energy is then discharged when electricity supply costs are higher this has the potential to offset the cost of grid supplied electricity.

5.2 Potential for battery storage across the Council estate

In March 2019, the new Greater Manchester 5-year Environment Plan was launched, setting a new target for the city region of carbon neutrality by 2038. The plan included a range of commitments for local authorities, including a target to develop 45 MW of energy storage over the next 5 years. Opportunities exist for large scale energy storage with the Council boundary which again requires further consideration of the land use at the sites identified. Table 6 sets out the opportunities which exist for large scale energy storage across the Council estate, which requires further consideration of the land use at the sites identified.

Table 6: Large scale energy storage opportunities

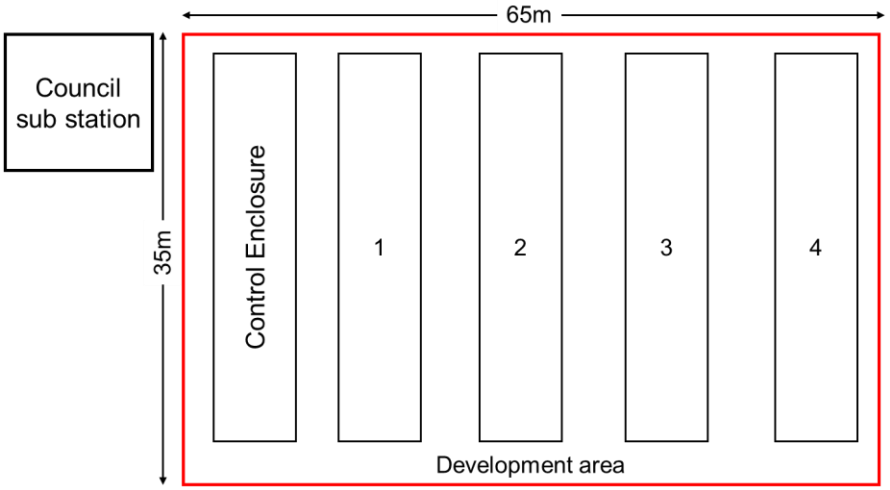
Site	Substation Name	Distance from substation	Battery energy storage headroom
Bradford Gas Works	Bradford (33 kV / 6.6 kV)	2.2km	7.8 MW
Airport Woodhouse Park	Moss Nook Primary (33 kV / 11 kV)	1.3km	11.2MW
Land south of Wythenshawe Hospital	Green Lane (Altrincham) (33 kV / 11 kV)	1.9km	10.0 MW

5.2.1 Land utilisation

A grid scale battery system consists of a group of containerised battery cells (usually Lithium Ion) that are connected to a major substation via a high voltage cable.

Figure 9, below, is a simplified and conservative system layout sketch for a 5 MW battery storage facility (including 4 x 1.26 MWh capacity enclosures and their associated transformers). This layout would occupy less than 0.25 Ha. A 2 MWh capacity battery storage system would typically be housed in 12.5m long containers which would reduce the development footprint further.

Figure 9: Simplified and conservative system layout sketch for a 5MW battery storage facility



Given the limited land requirement and access to a close grid connection point a battery storage facility could be included within the Council's overall employment use ambition for the land south of Wythenshawe Hospital.

As set out in section 4.5.3, the Council could consider a private wire connection to provide energy storage to Wythenshawe Hospital. A battery storage system would allow the hospital to control the timing and amount of electricity it purchases, sells or stores. This capability would enable the hospital to take advantage of a variety of opportunities to reduce electricity costs and generate revenues. Wythenshawe Hospital benefits from a recently installed Combined Heat and Power (CHP) unit which delivers almost all the power needed to run the hospital, as well as four new high-efficiency boilers. Supplementing the CHP with battery storage would give the hospital more flexibility over how to manage their energy.

A hospital's highest electricity usage typically occurs between 8 AM and 8 PM when demand for electricity and peak charges are high. Large-scale battery storage can help a hospital reduce peak costs by "shifting" all or part of its load to off-peak hours. By recharging a large-scale battery system during off-peak hours, the hospital pays the lowest rates for electricity. It can then use the stored electricity during the day to minimize the hospital's electricity purchases when charge rates are highest.

Both the Council and the hospital should seek specialist procurement advice in relation to any potential project.

5.2.2 Economics

We have estimated a cost of £2,535,000 for the installation of a 5 MW battery storage facility (including cell, balance of system and grid connection). Allowance would also need to be made for development costs e.g. planning application, surveys etc.

Revenue streams from storage projects are complicated and it is highly likely that the Council will need to work with an aggregator to ensure that they access the best sources of revenue at any given time.

Early battery storage projects were characterised by a revenue stack of 24/7 frequency response plus capacity market operated in a standalone fashion. Whilst this model was far from simple there are now several sources of revenue available, with the most lucrative options changing between capacity, ancillary services, trading and the Balancing Mechanism (BM).

Currently no one revenue stream holds the answer to a battery storage business case, revenue agility is required. An asset needs access to ancillary services, Distribution System Operator (DSO) services, reliable triad management, energy markets, BM, and any other services that emerge, to be truly optimised. Aggregators are currently indicating to potential clients annual revenues of £50,000 - £60,000 per MW for a 1-hour battery and £70,000 - £80,000 for a 2-hour battery. For a new build battery delivered from the early to mid-2020's we would expect an IRR between 9-10% to be achieved.

5.3 Next steps

- The Council needs to consider whether stand-alone battery storage would meet the new criteria for PWLB lending.
- The Council should consider the use of land for the three battery storage opportunities identified. Undertake engagement with stakeholders to achieve broad support and buy-in if a battery storage facility is considered a good use of the land available.
- The Council will need to submit a formal distribution grid connection application to secure grid capacity and engage with aggregators and technology suppliers to firm up costs and revenues.
- The Council should consider the addition of battery storage to any large-scale solar installation in order to hedge against price cannibalisation and improve viability.

Battery Storage – Key Points

Battery Storage projects will not directly contribute to the Council's carbon offsetting aims but are an essential part of the grid infrastructure required to deliver a decarbonised electricity system.

There is potential to investigate battery storage projects at the three sites identified. Battery storage should be considered on any large-scale solar projects to improve viability and hedge against price cannibalisation.

6 Onshore Wind

6.1 Background

Onshore wind turbines are also potential projects in which a local authority could invest. In wind energy projects, to produce renewable electricity and therby reduce their scope 2 carbon emissions. For example, is Bristol City Council became the first local authority in England to develop and own wind turbines. The two-turbine project was installed at the former Shell Tank site at Avonmouth and was commissioned in December 2013.

The most recent example is Cornwall Council's commercial investment into a single turbine (2.3 MW) project which became operational in September 2020. The turbine is sited on Cornwall Council land at Ventonteague, near Carland Cross, on the A30. The rationale for the turbine is to help Cornwall better manage its energy supply and power the equivalent of around 1,180 Cornish homes, representing a significant contribution towards the Council's climate emergency agenda. Cornwall Council own and operate the wind turbine. Earlier this year Orkney Islands Council submitted a planning application for a six-turbine wind farm which is in the process of being determined by Scottish Government. There are also micro wind turbine installation examples.

In comparison to solar PV, there are very few examples of local authority commercial scale development of onshore wind projects, with deployment being at the single or two turbine level and benefitting from niche land assets (such a Bristol City Council's project at Avonmouth). This is largely due to planning permission being one of the biggest barriers to project development for larger wind turbines and commercial wind farms. Project development is generally riskier than solar PV and can take up to several years to deliver.

Onshore wind is an established technology and offers one of the least-cost options for renewable energy supply; delivering electricity cheaper than conventional fossil-fuel technologies. Despite the strengths of onshore wind energy, widescale deployment of the technology in England and Wales last been largely restricted since 2015 due to the local and national planning requirements. Proposals often face local opposition, with visual impact, noise, site access and ecological impacts cited as reasons for objection. In the UK, 55% of historic onshore wind projects (between 1993 to 2019) were refused permission or abandoned (planning application withdrawn) by the developer.

Furthermore, legislation introduced under the Energy Act 2016 provided local authorities with the final say for all onshore wind energy projects and only allows wind turbines to be proposed for sites which have been identified within local or neighbourhood development plans. These changes effectively provided local communities with a veto to block the development of wind turbines.

In 2014 (the year before the planning changes were implemented) there were 156 onshore wind planning applications (51 in England). In contrast, only one application was submitted into the English planning system in 2020, with a capacity of 4.2 MW. This highlights the extent to which the local veto has all but stopped this form of development in England.

Historic planning consents in England have been at a total height of 125m. In recent years tip heights for schemes have generally increased to around 200m and the manufacturers are understandably concentrating on this larger market. In effect any

smaller schemes in England would therefore be unlikely to access the latest, most cost-effective turbines unless there is a softening of the planning consenting regime in England. Most commercial turbine manufactures (such as Enercon, GE, Nordex, Siemens Gamesa and Vestas) have phased out production of turbines below 150m to focus on the next generation of turbines at 180m tip heights and above. 180m tip height turbines have already been consented in Scotland, with projects at 200m+ also in the planning system.

Onshore wind turbines are typically located in areas with adequate wind speeds and in exposed locations free from obstacles like trees or buildings that can interfere with turbine performance. Table 7 outlines some of the key considerations for onshore wind site identification.

Table 7: Screening criteria for wind development

Key consideration	Comment
Wind resource/ viability	A minimum average windspeed of 6m/s+ will be required to obtain a reasonable return.
Monitoring wind speed	Wind speed monitoring is advisable prior to developing a wind energy project, to obtain more accurate data on wind speeds at the height of the proposed turbine. Wind monitoring also allows energy output for the project to be estimated. For commercial developers seeking project finance, this monitoring will be undertaken for a full year. Planning permission is also likely to be required for the wind monitoring mast.
Spacing	If more than one turbine is being installed, a space of at least five times the diameter of the rotor should be allowed between turbines to optimise power output by reducing wind shadowing and or turbulence.
Access	Access for the installation also needs to be taken into account. More remote locations will typically have a better wind resource, however access for vehicles to construct the turbine foundations and transport the turbine blades and other components to the project site may be constrained.
Grid connection	One of the main challenges wind development faces generally is the cost of procuring access to local grid infrastructure. Underground or overhead power lines can be very expensive, so the closer the site is to a suitable connection point the better.

Like for solar, sites identified for planned wind farms are subject to a formal application assessment. The National Planning Policy Framework aims to project Areas of Outstanding Natural Beauty, Sites of Special Scientific Interest and areas of high national heritage value from negative impacts of wind farm development. In addition to this, most commercial scale onshore wind turbine applications will require an Environmental Impact

Assessment (EIA), which assesses the potential visual impacts and changes to landscape and biodiversity that could result. Other areas the EIA covers includes:

- archaeology, hydrology and geology
- aviation and radar
- noise and shadow flicker impacts
- ecological impact

New onshore wind projects cannot receive planning permission unless an area is identified as suitable for wind energy in a local or neighbourhood plan. Table 8 sets out other key designated areas which need to be avoided along with some typical set back distances for onshore wind projects.

Table 8: Key designated areas and set back distances for onshore wind development

Key consideration	Comment
Designated nature conservation areas	Designated nature conservation areas should be avoided. Where sites are used by birds, ecologists may recommend set back distances from the boundary of designated areas.
Designated landscape	Designated landscapes may or may not be suitable for wind turbines, depending on the reason for their designation and the impact that wind turbines may have on this. Views from designated landscapes to wind turbine sites will also need to be considered.
Bats	Hedgerows and woodland areas need to be avoided to reduce the potential impact on bats. Ecologists will recommend separation distances.
Residential properties	A setback distance of at least 600 - 800 metres from residential properties for large wind turbines is recommended. However, as local communities have a veto to block the development of wind turbines, engagement with the local community should on sought on setback distances.
Infrastructure	Minimum distances from roads, power lines, gas pipelines and other infrastructure, which are required by the Highways Agency and other infrastructure operators including National Grid.
Exclusion areas	Exclusion areas around airports, airfields and MOD land exists. Depending on the nature of the project, this should be determined in advance in consultation with the relevant body.
Communication equipment (telecoms)	Communications equipment need to be taken into account in consultation with the relevant telecoms operators such as Openreach.

6.2 Potential for onshore wind across the Council estate

We have reviewed the Councils lands assets and were not able to identify any suitable areas that could potentially support one/two commercial size turbines, or the deployment of micro turbines.

6.3 Onshore wind market review

An analysis of the BEIS Renewable Energy Planning Database quarterly extract for September 2020 indicates that there are 84 onshore projects greater than 5MW that have been consented between 2016 and 2020 that are still awaiting construction. This pipeline totalling 3.6 GW is comprised of 65 projects only one of which is in England. The remainder are in Scotland (65), Northern Ireland (13) and Wales (5). In terms of the MCC requirement (range 20MW to 60MW) there are 45 projects all of which are outside England. This would mean that the Council would need to be open and able to invest outside England. Developers of these projects have not historically sold assets or are already committed to existing investors.

The announcement that there will be a Contract for Difference (CfD) pot 1 allocation in 2021 (see Appendix 1) will also provide further certainty in this market and drive competition. Large projects or portfolios of projects in high wind speed areas in Scotland and Wales are likely to be the main beneficiaries in the fourth allocation round.

6.4 Next steps

- The Council needs to determine whether it can invest outside England.

- Approaches could be made to wind turbine developers who have assets which have not been constructed, but as these are generally tied in to a particular investor it is unlikely that would be available for purchase.

Onshore Wind – Key Points

Onshore wind is one of the most established technologies and offers one of the least-cost options for renewable energy supply and delivers electricity cheaper than conventional fossil-fuel technologies.

We have reviewed the Councils lands assets and were not able to identify any suitable areas that could potentially support one/two commercial size turbines, or the deployment of micro turbines.

Only one onshore wind application was submitted into the English planning system in 2020, with a capacity of 4.2 MW.

There is potential for the Council to investigate the acquisition of consented projects which are still to be constructed, however any acquisition would be outside England and it is not likely there would be a significant number (if any) assets available for a transaction of this nature.

7 Offshore Wind

7.1 Background

The Crown Estate manages the seabed around England, Wales, and Northern Ireland. The Energy Act 2004 vests rights to The Crown Estate to license the generation of renewable energy on the continental shelf within the Renewable Energy Zone out to 200 nautical miles.

In 2001, The Crown Estate announced the first UK offshore wind leasing round and since has run two further leasing rounds in 2003 and 2008. Thirty-nine offshore wind farms have been built by the sector, comprised of 2,292 turbines with an operating capacity of 10.4 GW. In September 2020, the Crown Estate awarded lease agreements to six proposed offshore wind project extensions in the waters around England and Wales (totalling 2.8 GW).

The Crown Estate is currently in the process of running its fourth leasing round, creating the opportunity for at least 7 GW of new projects. Prospective developers have been given the opportunity to identify and propose project sites within four broad seabed Bidding Areas. The Round 4 leasing process consists of five stages, the pre-qualification stage of which has already been completed. Invitation to Tender Stage 2 and bidding cycles are expected to take place in early 2021.

The Crown Estate is expecting to enter into a wind farm agreement lease with successful bidders in Spring 2022. Once seabed rights have been awarded, project developers will apply for the required statutory development consents. This is required as each project will be at least 400 MW. Developers will also require consent for the construction of the wind farm's offshore cable connection to the onshore grid and associated onshore permissions.

The development and consenting stage of the process is managed by the wind farm developer. The main offshore UK developers are: EDF Renewables, EDP Renewables, E.ON, Equinor, Innogy, Ørsted, Red Rock Power, ScottishPower Renewables, SSE and Vattenfall. A guide to an offshore wind farm was published on behalf of The Crown Estate and the Offshore Renewable Energy Catapult[5] in 2019. This guide sets out the costs associated with the development, construction and operation of an offshore wind farm. Development costs alone (development and project management) for a 1 GW installation are estimated at £120m. There are no speculative developers in this market and most projects are developed and owned by these companies

Once consents are granted, developers will then need to take part in CfD auctions to bid for support to build and run the wind farm. It is currently anticipated that Round 4 projects will become operational towards 2030.

There is no real market to purchase offshore wind turbines other than to participate in the auction for leasehold rights and then go on to develop assets.

[5] https://ore.catapult.org.uk/wp-content/uploads/2019/04/BVGA-5238-Guide-r2.pdf

7.2 Offshore wind – suitability

Offshore wind is not considered to be a suitable investment to meet the Council's requirements due to the scale of investment, the capacity required to acquire and develop assets and the extended timescale for assets coming on stream. The extended timescale would mean that an acquisition of this nature would not deliver the Council's carbon budget requirements.

Offshore Wind – Key Points

The MCC requirement would represent less than 1% of the current Round 4 opportunity.

The pre-qualification stage for Round 4 has already been completed.

Development costs associated with offshore wind are significant and any partnering/acquisition opportunity (given the MCC requirement) is likely to be extremely limited.

Round 4 projects are not forecast to become operational until the end of the decade and this would not meet the Council's carbon budget requirements.

8 Solar PV Market Review

8.1 Background

In order to meet its targets to offset 7,000 tonnes of CO_2e by 2025 the Council will need around 45-50 MW of solar PV generation (depending on location).

8.2 Opportunities within the Council's boundary

A review of Council owned sites and planning applications within the Council's area over the last two years has not provided any potential schemes within the Council's boundary.

8.3 Opportunities within the Greater Manchester Combined Authority boundary

Other councils in the Greater Manchester Combined Authority area are also exploring potential opportunities for solar farm sites. The ground mounted projects planned include solar farms at Chamber House farm in Rochdale (5 MW) and Kenyon Way in Salford (1.7 MW). Initial indications are that the size of the schemes are not large enough to benefit from a collaboration with the Council.

8.4 Out of area opportunities

We understand from discussions that the Council is open to financing an out-of-area investment if that is the best alternative and it is able to do so within the new PWLB lending criteria. Engagement with active solar PV has identified three potential projects that are in development and are available to purchase. The purpose of this section is to set out those opportunities and how the Council can position itself to be able to respond, either to these opportunities or to further market opportunities as they arise.

8.5 Solar PV market investments

The market for well developed, de-risked and subsidy backed solar PV projects remains high. This drives high prices and relatively low yields due to the secure nature of the income streams.

Local Partnerships has been tracking the pricing of operational disposals and have seen an upward value trend for operational (subsidy backed) solar PV transactions with prices of circa £1m per MW representing a current market benchmark. The majority of investors in the subsidised market are looking to move into the unsubsidised market. Those with large subsidised portfolios have substantial experience of managing merchant risk within these portfolios as a proportion of their income will be from trading wholesale power within their existing generation fleets.

We expect, and have already seen, that investors who need to continue to deploy capital into renewable generation and have experience in solar PV will invest in unsubsidised projects. The announcement that there will be a Contract for Difference (CfD) pot 1 allocation in 2021 (see Appendix 1) will also provide further certainty in this market and

drive competition. Without CfD, projects require a relatively long-term Power Purchase Agreement (PPA) to cover eight to ten years of operation at the start of the project in order to create financial certainty in the early years. Renewed interest from the funds has resulted in project developers returning to the market. There has been a significant shift towards larger projects with the smallest new projects typically exceeding 25 MW.

To date there have been relatively few transactions of operational subsidy-free solar projects. Gridserve purchased the first subsidy-free solar farm from developer Anesco as recently as August 2020 (for an undisclosed sum). From discussions with active solar PV developers we understand developers are targeting pricing in the range of £550,000 to £650,000 per MW for constructed and connected assets. This reflects the greater risk of variable income associated with subsidy free development in comparison to £1m per MW for subsidy backed operational projects. It is likely that any solar projects which secure CfD will be more valuable than those trading on a merchant basis. One of the main challenges renewable energy development faces is the cost of procuring access to local grid infrastructure. Grid connection cost is therefore a key driver of project viability generally and price expectation within the range where viability is established.

Private sector developers are able to access significantly lower construction pricing than has been seen to date in the public sector. Public sector construction pricing is similar to the costs quoted for completed projects, so serious consideration should be given to projects which can be bought as they become operational. These projects represent a cost-effective solution for the public sector with significantly better risk profiles than schemes in development or at shovel ready.

8.6 Useful life

In the pre-construction solar PV market we are seeing increased focus on the useful operating life of projects, with developers seeking to obtain planning consent for 40 years and including provisions to extend land leases to match. This has led to an increased understanding of the potential value and technical requirements of investors to apply this extended life. This will result in more aggressive assumptions being made by funds on the potential project duration when assessing the viability of projects.

8.7 Technological improvements

Panel manufactures have continued to increase the efficiency of their technology. The emerging technology within the industry (bifacial modules and single-axis solar trackers) provide greater land-use options and offer a higher yield. Bifacial solar panels generate power by exposing both sides of the cells to sunlight, increasing total energy generation. The technology is relatively new and reported outputs are higher but sufficient data is not yet available to allow reliable modelling to take place in the UK. This coupled with reducing panel costs and the significantly larger size of new developments is having a positive impact on the economics of subsidy free solar PV. We expect investors bidding into market opportunities to factor in these improvements.

Single access tracker systems are common in the United States but have not featured to any significant extent in the UK so far. Build and maintenance costs are higher, but so are yields. The Warrington BC/Gridserve sites are the first deployment of large-scale single access trackers in the UK (examples of technology are shown in Figure 10 and Figure 11 for information).

Figure 10: Traditional fixed mounting structure solar farm with standard solar panels[6]

Figure 11: Single access tracking solar farm with bi-facial panels[7]

[6] Image bsg-ecology.com
[7] First4solar.co.uk

8.8 Structuring

The buyer pool for large projects are all astute financial institutions who will employ different but effective structuring to ensure that their investors' tax exposure is limited. As such, assumptions on structuring are variable and can also impact value.

From discussions with active solar PV developers who sell assets there is recognition of the advantages that local authorities would bring to transactions (e.g. motivations for investment, low cost of borrowing, their own power purchase requirements, return expectations and the ability to look at longer term project time horizons). It is likely that local authorities would be competitive in bidding processes. Subject to acceptable valuation, there is also willingness to align transaction timelines with council approval processes.

8.9 Positioning the Councils to respond to market opportunities

The pipeline of UK solar farms (as at September 2020) was 10.6 GW across 442 sites. 24.8% of the entire ground-mount pipeline capacity in the UK is coming from sites planned to operate at between 40 and exactly 49.9 MW. 29.6% of projects fall into the 250 kW to 5 MW band. These smaller sites are often local-council, public sector or landowner-based projects. The key message for the Council is that developers don't have the capacity to build every consented project, but the Council will need to be flexible both on location and size of project.

From our engagement with active solar PV developers who sell assets, it is clear that smaller size projects are available (5-10 MW) however the viability of projects that we have appraised has been difficult to establish. We therefore recommend that the Council should shape its approval processes and governance around a single 40 – 50 MW stand-alone project (on a subsidy free basis), with the flexibility to invest in two smaller size projects should they be financially viable and the projects become available.

Appendix 3 sets out more detail about the nature of activities required in the purchase of a large solar farm. Transactions of this nature are relatively competitive and there is a need to be able to take decisions relatively rapidly. The Council should consider what preliminary and delegated authorities are required to allow it to properly analyse and progress a transaction of this nature.

8.10 Active Projects

We have identified three currently available projects across the UK.

Project A – North West – 30 MW

Project is in development. Grid and land rights appear to have been secured by the developer. Planning is yet to be submitted. Earliest energisation date Q4 2023. Community development company.

Project B – The Midlands – 45 MW

Project has grid and land rights secured. Planning consent has been granted for the scheme. This scheme has a grid connection at 132kV which will add some

complexity. Opportunity to purchase post construction. Earliest energisation date Q1 2022. Commercial developer.

Project C – Southern England – 46 MW

Project has grid and land rights secured. Planning consent has been granted for the scheme. Earliest energisation date Q3 2021. Commercial developer.

Table 9 sets out the different solar irradiance at these locations and compares them to the irradiance in central Manchester, together with the tCO_2e each scheme would offer between 2025 and 2038.

Table 9: Schemes irradiance and potential carbon savings (2025-2038)

Location	Forecast Irradiance (kWh/kWp)	Delta to Manchester	tCO_2e
Manchester	945	n/a	n/a
North West	958	+1%	48,238
The Midlands	989	+5%	74,699
Southern England	1065	+13%	82,227

8.11 Public Works Loan Board Consultation

On 26th November 2020 the UK Government published its response to the consultation on future lending terms for PWLB[8]. The aim of the consultation was to *"..develop a proportionate and equitable way to prevent local authorities from using PWLB loans to buy commercial assets primarily for yield, without impeding their ability to pursue service delivery, housing, and regeneration under the prudential regime as they do now."*

The Government has now introduced new terms to apply to all loans arranged after 26 November 2020. Under these terms the s151 Officer will need to confirm that there is not an intention to buy investment assets primarily for yield, based on their professional interpretation of the guidance.

In relation to specific concerns raised by some respondents (item 3.99 of the response to the consultation) that they carry out some capital spending on green or renewable energy developments which support the local authority's policy objectives to achieve carbon neutrality but were not necessarily located within the authority's wider economic area, the Government response was: "*The government will not restrict local authorities' ability to carry out capital projects in neighbouring districts or the authority's wider economic area*

[8] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938043/Response_to_consultation_Public_Works_Loan_Board_future_lending_terms_1.pdf

where these projects are for service delivery, housing, preventative action, or regeneration"

8.12 Next steps

- Develop sufficient outline business case authority to set up a decision making framework which allows the Council to act with sufficient speed to maintain market interest in a transaction whilst remaining within the decision making framework of the Council.

- Obtain in-principle support to enter into an exclusivity period/undertake project due diligence as opportunities arise.

- Review the project specific information in relation to the three currently identified projects and determine whether to pursue an exclusivity agreement in relation to any of these opportunities.

Market Opportunities – Key Points

There are opportunities to purchase solar PV schemes directly from developers, but these are unlikely to be within the Council boundary area.

50 MW schemes are available in the current market although the Council may need to show flexibility around actual sizing. The numbers of projects coming to the market are relatively small and the Council needs to be prepared to move at speed and be flexible in how they meet their requirement.

A budget of £ 27 - 30m would allow the Council to purchase sufficient assets to meet the requirements set out in this report.

The Council's s151 officer will need to be satisfied that an investment of this nature meets the new PWLB lending criteria.

9 The PPA alternative

A number of local authorities are exploring the route of purchasing 'green' electricity in order to meet their current carbon budgets.

Section 3.3 sets out the basis for carbon accounting for scope 2 emissions (grid supplied electricity). If dual accounting is to be used then good practice suggests there needs to be a very clear rationale for the inclusion of other electricity sources and in particular; additionality (i.e. demonstrating you triggered new capacity), traceability (i.e. how you can demonstrate where the power is generated) and permanence (i.e. long term arrangements that cannot easily be reversed) will be required to justify inclusion.

The duration of a PPA is an important factor in whether it would be legitimate to account for the carbon savings, with longer term agreements being beneficial. Longer term agreements however come at the risk of mismatch between the Council's requirements and the supply levels in the agreement. Longer term PPAs are likely to have a minimum supply requirement, below which the offtaker (i.e. the Council) will pay for power generated whether or not they are able to consume it.

If the Council were to pursue a green PPA there are two main scenarios i.e:

a) Purchase a 'green tariff' from a supplier

b) Direct purchase of electricity from a renewable energy generating station

9.1 Green Tariffs

A green tariff means that some or all of the electricity you buy is 'matched' by purchases of renewable energy that your energy supplier makes on your behalf. These could come from a variety of renewable energy sources such as wind farms and hydroelectric power stations. Renewable energy generation is demonstrated by the Renewable Energy Guarantees of Origin (REGO) certificates.

The Council's current supplier, nPower, offer tariffs for 10-15 years linked back to specific, identifiable generating stations.

9.1.1 Applying the tests of additionality, traceability and permanence

Before a green tariff is included in an organisation's carbon accounting it should meet the requirements of additionality, transparency and permanence.

I Additionality – green tariffs

Green tariffs rarely meet the additionality criteria as they may be part of an existing portfolio of assets. Furthermore, new green tariff customers will increase demand for green electricity which will be taken from the general portfolio of the provider, potentially making the general electricity supply from the provider to customers not on a green tariff more carbon intensive.

A green tariff is therefore unlikely to meet a specific additionality test even where it is from a clearly defined source. There is also nothing in the nPower agreement which

would preclude the supplier from applying for a CfD for the scheme. Where as scheme has CfD certainty it is very unlikely that the supply contract with the provider would be sufficient to meet the requirements of additionality.

II Traceability – green tariffs

Green tariffs should be able to provide REGO certificates for every unit of power consumed. Provided they are able to do this then potentially they do pass the transparency test, although it is preferable if the certificates are traceable to a single nominated source. REGO certificates can be traded independently of the source from which they originate which reduces their value in the eyes of some observers.

III Permanence – green tariffs

Permanence is the most difficult test for any form of PPA as they are often short term contracts, after which time there is no obligation on the accounting organisation to continue the arrangement. Whilst flexibility is often valued in PPAs it is to the detriment of accounting for the carbon saved.

There are no hard and fast rules for the length required of a PPA before it is considered to have a degree of permanence. Forecasts for decarbonisation of UK electricity range from 2030-2050 and arguably any green tariff would need to be for a period until grid decarbonisation has occurred i.e. 10-30 years. Most green tariffs are of a significantly shorter period than this.

9.2 Direct PPAs with a generator

It is possible to purchase electricity directly from renewable energy generators through a direct PPA agreement. This can either be synthetic or sleeved (see Appendix 1 for a description of the differences). A direct PPA with a specific asset that is not part of a larger pool of assets supplying a range of customers has a potentially stronger weighting in carbon accounting terms than a green tariff.

A PPA of this nature would require a procurement exercise to put it in place and could be on the basis of either a sleeved or synthetic PPA.

9.2.1 Applying the tests of additionality, transparency and permanence to a PPA directly with a generator

I Additionality

Any tender exercise could state that the generation capacity was not subject to any forms of subsidy and was new build generation. This would potentially meet the criteria of additionality.

II Transparency

In addition to the REGOs the Council would benefit from a direct relationship with the energy generator to demonstrate the source of the electricity consumed.

III Permanence

This will depend on the length of the PPA agreement. Current market PPAs are largely of the 5-8 year duration. Beyond this longer term arrangements are available but come at a premium of around 10%.

It may be possible to make a case for permanence in that the new generating asset would have been created because of the initial PPA, however it does not provide permanence to the decarbonisation of the Council's electricity supply.

10 Options Appraisal

This options appraisal has been based around the Treasury Green Book recommendations.

10.1 Options for Appraisal

The following options have been considered in this options appraisal:

1. Do nothing
2. Fair value solar PPA – direct with a solar farm operator
3. Fair value wind PPA – direct with a wind turbine operator
4. a) Asset purchase of 49 MW site in southern England with PWLB lending over 25 years
   b) Asset purchase of 49 MW site in southern England with PWLB lending over 35 years
5. a) Asset purchase of 46 MW site in the Midlands with PWLB lending over 25 years
   b) Asset purchase of 46 MW site in the Midlands with PWLB lending over 35 years
6. nPower wind PPA
7. nPower solar PPA

10.2 Preliminary appraisal – affordability

Before proceeding further with the options appraisal net present value (NPV) calculations were produced for all of the alternatives and compared to option 1 – 'do nothing'.

This modelling was undertaken by Local Partnerships on behalf of the council and utilises third party data from Aurora Energy Research (Aurora). Local Partnerships are subscribers to Aurora, who are a market leading provider of energy price forecast information. Using high quality forecast information for forward energy prices provides the council with the highest likelihood of a robust npv calculation. Aurora's information is the basis of their business and clients are tied with strict contractual terms that prevent the release of forecasts to non-subscribers. Local Partnership's agreement with Aurora allows them to use the information in financial modelling and to release the outputs of that modelling in a form where the original data cannot be reverse engineered, but not to release the financial models as these contain the embedded data sets. We have therefore included the assumptions for the financial modelling and the outputs of the npv calculations in this report.

Local Partnerships and Aurora have undertaken a workshop with council officers to ensure that the council understands the basis of the data and the financial models that produce the npv information used in this report."

10.2.1 NPV assumptions

All NPV calculations have been appraised over an 8 year and a 25 year period and compared to a 'do nothing' scenario based around ongoing purchase of wholesale

electricity. The 'do nothing' scenario relies on the Aurora Energy Research central power price curve for wholesale power. Table 10 shows the assumptions embedded in the NPV model.

Table 10 – NPV assumption fields in the model

	Input Data	
MCC total requirement (excluding schools)	45,000	MWh
Site 1 (southern England) Installation Size	46,092	kW
Site 1 P50 Generation Specific annual yield	1,065	kwh/kwp
Site 2 (the Midlands) Installation Size	45,000	kW
Site 2 P50 Generation Specific annual yield	989	kwh/kwp
Deterioration	0.40%	Module degredatior
Inflation	2.0%	
Inflation base year	2019	
npv discount rate	5.6%	
Differential between central and fair value	2.0%	
Solar sleeving costs (£ 6/MWh)	£0	per MWh
Wind sleeving costs (£ 7/MWh)	£0	per MWh

10.2.2 PPA Duration

An 8 year duration has been taken for the PPA agreements following a discussion with Aurora Energy Research, with the view being that prices for longer term PPAs would be higher than the values modelled. For the fair value PPAs it does not make a significant difference to the scenarios if the duration is longer as the prices revert to the Aurora solar central case less 2% adjustment for fair value. A more significant impact is seen in relation to the nPower PPAs, although the wind PPA offers considerably lower value in the short term where prices would be higher than modelled for the first four years.

The asset purchase models are unaffected as they are based on costs incurred rather than price paid. The gap between costs incurred and price paid increases over time so in all scenarios the asset purchase models look better over a longer duration.

10.2.3 Deterioration

The speed at which solar panel efficiency decreases over time. The assumed rate at 0.4% is within the industry standard rate, but less than the likely module guarantee rate of around 0.5% pa.

10.2.4 Inflation

2% CPI has been used throughout as this is the Government target figure. Base year relates to the base year for Aurora price information.

10.2.5 NPV discount rate

This is the Treasury Green Book rate adjusted for schemes which include inflation.

10.2.6 Differential between central and fair value

Adjustment applied to Aurora central solar price forecast curve to achieve the Aurora fair price. This price represents the price most likely to be paid by an offtaker when all factors are taken into account (such as transaction costs etc).

10.2.7 Sleeving Costs

Differential rates for wind and solar have been discussed with Aurora. We have not applied sleeving costs in the final models as they can be avoided by the use of a synthetic PPA agreement and destroy considerable value in all schemes (except the nPower options). Synthetic PPAs are compliant for greenhouse gas accounting (as confirmed with Anthesis).

10.2.8 Asset purchase schemes – traded balances.

As these schemes are not exactly sized to the Council's requirement there are differences between the energy produced and the energy consumed. With a synthetic PPA the Council will have PPAs in place with energy suppliers as well and these additional volumes can be included in these contracts. The models have therefore included for a revenue where there is over generation and for purchased electricity where there is under generation.

10.2.9 Operating and maintenance costs for asset purchase schemes.

The model allows for the following: £ 10,500 O&M contract including cyclical replacements, £ 1250 insurance, £ 2,800 rent, £ 2,000 rates, £ 2,500 asset management, £ 5,000 contingency and the Council's internal costs. All costs are per MW installed per year. The asset management service will in effect run the farm for you and manage the contractors, billing etc. The contingency amounts to around £ 230,000 pa and will allow the Council to have a member of staff who can deal with this and as well as providing general contingency to the investment. The costs allowed are all reasonably generous.

10.2.10 Finance period

The asset purchase scenarios have reviewed both a 25 year financing period and a 35 year financing period. A solar asset is anticipated to have a life of 35-40 years.

The 35 year asset financing scenarios have a residual balance on both schemes of around £ 11m at the end of year 25.

10.2.11 Post PPA assumptions for the 8 year PPA scenarios

For all of these scenarios (both nPower and the fair value agreement directly with an asset operator) the schemes revert to the fair value solar price curve for the respective technology after the end of the 8 year PPA period.

10.3 NPV outputs

Table 11 below sets out the outputs from the NPV exercise undertaken by Local Partnerships and utilising the confidential Aurora data.

Table 11: outputs from NPV comparison exercise

Manchester City Council Scenario Comparisons (February 2021)

			Total Cost (25 yrs)	Cost after 8 years	25 year npv	8 year npv
	With sleeved PPAs					
1.	Do Nothing (assumes Aurora wholesale plus inflation)		-£85,558,054	-£21,965,089	-£43,366,132	-£17,091,133
2.	Fair Value Solar PPA Option	V Do Nothing	£15,808,392	£2,593,361	£7,235,495	£1,966,242
3.	Fair Value Wind PPA Option	V Do Nothing	£22,385,253	£5,528,952	£11,169,161	£4,258,268
4.	Solar Own/Operate Option Site 1 (southern England)					
4. a)	Solar own and operate with 25 year finance (southern England)	V Do Nothing	£22,017,266	£3,055,525	£9,977,925	£2,207,730
4. b)	Solar own and operate with 35 year finance (southern England)	V Do Nothing	£30,147,626	£5,765,645	£14,403,842	£4,347,664
5.	Solar Own/Operate Option Site 2 (the Midlands)					
5. a)	Solar own and operate with 25 year finance (the Midlands)	V Do Nothing	£20,225,002	£1,081,277	£8,263,154	£629,010
5. b)	Solar own and operate with 35 year finance (the Midlands)	V Do Nothing	£28,230,442	£3,749,757	£12,621,068	£2,736,065
6.	npower wind PPA (£48.50) indexation 2.0%	V Do Nothing	£20,089,059	£3,232,759	£9,293,783	£2,382,890
7.	npower solar PPA (£47.10) indexation 2.0%	V Do Nothing	£16,988,517	£3,773,486	£8,076,710	£2,807,458

Several of the scenarios are effectively derivatives of the same option i.e. the fair value PPAs and the nPower PPAs together with the different finance options for the asset purchase options. The asset purchase options are not directly derivatives of each other as aside from variations in size and output the Midlands opportunity represents what might normally be available in the market where the southern England scheme is a particularly good one and may not be representative of what is available when the Council have decided on their preferred approach.

Recommendation 2: All options have positive NPV outcomes when compared with 'do nothing'. There is therefore a solid value for money basis to either enter into a suitable PPA or asset purchase agreement.

10.3.1 Options for Further appraisal

In order to keep the options appraisal to a manageable exercise, the best value alternatives of each of the derivatives have been taken forward into the next stage as follows:

1. A wind based PPA with nPower (current electricity supplier) linked to specific projects. This is for an 8 year duration and pricing has been obtained from nPower.
2. A wind based PPA direct with a turbine operator. This assumes an 8 year duration with pricing based around the Aurora Energy Research fair pricing model.
3. An asset purchase of a 49 MW solar farm post construction. The farm is based in southern England and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.
4. An asset purchase of a 46 MW solar farm pre-construction. The farm is based in the Midlands and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.

10.4 Criteria and weighting for options appraisal

The following criterial have been developed for the options appraisal based around the Green Book criteria of desirability, feasibility and viability.

The weighting figures are out of a maximum of 10 for each criteria (and balance to 100 overall and are shown in table 12). These represent the relative importance of different measures in reaching a decision and have been developed from the workshops run with the Council to develop their understanding of options and associated risks.

Table 12 – Weighting and criteria for options appraisal

Criteria	Weighting
Desirability	
Reduction of CO2e emissions by 7,000 tCO2e by 2025	10
Are CO2e savings lasting upto and beyond 2038 (this criteria is included as a measure of the permanence provided by the option)?	7
Is the option available to current MCC partners?	2
Feasibility	
What is the earliest implementation date?	7
How well does the option fit with the likely scope 2 emissions for MCC?	6
Does the option have reputational risks?	7
Does the option expose MCC to a risk of challenge through procurement?	7
Does the option expose MCC to a risk of challenge to its carbon accounting practice?	8

Criteria	Weighting
Viability	
What savings can be realised by the option during a typical 8 year PPA time horizon (NPV v do nothing)?	8
What savings can be realised by the option during a typical 25 year financing period for an asset purchase?	8
Are there savings available beyond 25 years? This measure is included to show whether an option provides cashable savings beyond year 25.	4
Are there viable mechanisms for adjusting supply volumes over time?	8
Does the option provide protection against energy price increases (short and long term)?	3
Are MCC able to resource the option with suitable capacity and capability?	5
What capital is required by MCC to implement the option?	5
What resources are required by MCC to manage the option on an ongoing basis?	3
Will the option positively impact the market?	2

10.4.1 Scoring methodology

Each of the criteria has a documented methodology by which each option is scored, these are set out in table 13 below.

Table 13 – Basis of scoring for each criteria

Criteria	Points allocation basis
Reduction of CO2e emissions by 7,000 tCO2e by 2025	10 points if 7,000 tCO2e reduction by 2025. Less one point for each -5%duction by 2025. Less one point for each -5%
Are CO2e savings lasting up to and beyond 2038 (this criterion is included as a measure of the permanence provided by the option)	0.5 points for each year of certainty offered for each year from year 5 onwards (all schemes provide certainty for at least 5 years)
Is the option available to current MCC partners?	1 point for up to 20% of partners supply that could be offered and 1 point for each additional 20%. To reflect flexibility remaining 5 points are as follows 5 points for agreement of 2 years or less, 4 points for 2-3 years, 3 points for 3-4 years, 2 points for 4-5 years, 1 point for 5-8 years
What is the earliest implementation date?	H2 2021 = 10 points, H1 2022 = 8 points, H2 2022 = 6 points, H1 2023 = 4 points, H2 2023 = 3 points, H1 2024 = 2 points, H2 2024 = 1 point
How well does the option fit with the likely scope 2 emissions for MCC?	First 8 years - within 10% = 6 points, within 25% = 4 points, less than 75% = 0 points. PLUS long term after year 8 - very flexible = 4 points, flexibility can be achieved (e.g. through sale or purchase outside the contract) =2 points, none = 0 points
Does the option have reputational risks?	Likely to occur and attract ongoing publicity as issue cannot easily be resolved = 0 points, could occur on a one off basis, but can be mitigated = 5 points, unlikely to occur = 10 points
Does the option expose MCC to a risk of challenge through procurement?	Existing framework can be used = 10 points, one off new procurement = 8 points, specialist advice to structure agreement = 6 points

Criteria	Points allocation basis
Does the option expose MCC to a risk of challenge to its carbon accounting practice?	Assumes all options can demonstrate that the energy is renewably produced via the issue of REGO certificates. Ability to demonstrate additionality = 5 points, PLUS ability to demonstrate permanence = 5 points
What savings can be realised by the option during a typical 8 year PPA time horizon (NPV v do nothing)?	(option value/value of best option)*10
What savings can be realised by the option during a typical 25 year financing period for an asset purchase?	(option value/value of best option)*10
Are there savings available beyond 25 years? This measure is included to show whether an option provides cashable savings beyond year 25.	Yes =10, No = 0
Are there viable mechanisms for adjusting supply volumes over time?	Assessed in two parts. Part 1 - flexibility in years 0-8. +/- up to 10 % = 2 points, +/- 25% = 5 points. Part 2 - rebalancing. Ability to rebalance supply volume at year 8 = 5 points, no = 0 points
Does the option provide protection against energy price increases (short and long term)?	Yes =10, Yes, but only for first 8 years = 4, No = 0
Are MCC able to resource the option with suitable capacity and capability?	Within existing capacity and skills = 10, will require some bought in capacity (up to £ 50k expenditure) = 6 points, will require significant additional support = 3 points
What capital is required by MCC to implement the option?	Capital requirement 10 points for nil capital investment. Less 1 point for each £ 5m capital investment required
What resources are required by MCC to manage the option on an ongoing basis?	Costs fully included or within existing resources = 10 points, - 3 points for each uncosted FTE required for support
Will the option positively impact the market?	Impact on the UK energy mix - up to 3 points. Sector leadership up to 7 points

10.5 Options Appraisal Outputs

Utilising the weighting and criteria set out in section 10.4 each of the four options has been appraised. The weighting scheme provides a score as a % with higher scores being a closer fit with criteria than lower scores.

A full copy of the options appraisal matrix is in appendix 5 to this report (Excel Workbook).

The outputs from the scoring exercise are as follows (table 14):

Table 14 – outputs of options appraisal scoring exercise

Option	Description	Score	Rank
1.	**nPower wind PPA.** A wind based PPA with nPower (current electricity supplier) linked to specific projects. This is for an 8 year duration and pricing has been obtained from nPower.	61%	4
2.	**Fair Price Wind.** A wind based PPA direct with a turbine operator. This assumes an 8 year duration with pricing based around the Aurora Energy Research fair pricing model.	72%	2=
3.	**Asset Purchase (Southern England).** An asset purchase of a 49 MW solar farm post construction. The farm is based in southern England and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.	80%	1
4.	**Asset Purchase (The Midlands).** An asset purchase of a 46 MW solar farm pre-construction. The farm is based in the Midlands and terms have been discussed directly with the owners. Financing is through a 35 year PWLB loan at 1.46%.	73%	2=

10.6 Options Appraisal Summary

As all options represent better value for money than do nothing there is a clear case for developing and implementing a new regime in relation to the Council's electricity procurement.

The scoring exercise for the options appraisal has a clear front runner in the site in southern England, however this site represents a particularly good option and may not always be replicable in the market place if the Council are not able to act quickly enough to secure this option.

There is little to choose between a wind based fair value PPA and a more usual asset purchase alternative, although the financial modelling assumptions for the asset acquisition are more conservative.

The pursuit of a PPA agreement with a major electricity supplier is unlikely to represent the best alternative due to both value for money and carbon accounting compliance.

11 Risks and other considerations in decision making

11.1 PWLB risk factor

The options appraisal has not taken account of the potential PWLB lending risk in relation to an out of area asset purchase. This has been taken out to allow the Council to understand the best option in terms of delivery of its objectives.

The PWLB risk remains and before the Council could pursue and asset purchase strategy it would need to seek assurances from HM Treasury that borrowing for this purpose would not breach the PWLB lending terms. In relation to investment for yield there is a clear case that an asset purchase would represent delivery of the Council's decarbonisation targets and would represent value for money compared to existing arrangements to procure electricity. The more significant risk lies with the criteria to invest in the 'economic area' and this would need to be explored further.

Recommendation 3: Having undertaken a thorough options appraisal exercise the Council is now in a position to explore with HM Treasury whether or not an asset purchase would be compliant with PWLB lending terms.

11.2 Asset acquisitions

Market engagement has identified three potentially suitable schemes which are currently available and could meet some or all of the Council's requirement. In order to progress opportunities, the Council will need to take sufficient early decisions to enable it to enter into an exclusivity agreement and undertake due diligence. Speed of decision making is key to success in acquiring projects in a competitive market.

A number of local authorities have successfully invested in renewable energy generating assets and there are likely to be opportunities for other local authorities to follow suit. Whether it is better to seek to develop an asset, or buy one from a commercial developer, will depend on the opportunities available and how each local authority responds to individual challenges.

Local authorities should not assume that it will be more cost effective to develop their own schemes. Solar PV and wind developers have worked hard to drive down costs in recent years and bring considerable leverage and expertise to the market. Some of these schemes are likely to offer better value for money, and at less effort, than development of schemes from scratch.

An asset purchase would tie the Council's electricity costs to the cost of operating the asset and servicing debt raised; representing a saving of around 10-15% of current electricity costs. Predicting the costs of financing and operation is relatively straightforward and an asset purchase would therefore provide a degree of cost certainty to the Council's energy planning as well as potential cost savings.

If the Council's electricity demand diminishes over time, there would be the ability to sell any surplus generation to a third party.

Schemes which combine solar PV with battery storage will generally provide a better match against the Council's electricity usage profile and improved savings as fixed cost infrastructure can be shared across the two technologies.

11.3 PPA opportunities

In considering a PPA option the Council will need to balance its desire for flexibility with the need to demonstrate permanence in order to meaningfully account for the carbon saved. An agreement directly with a generating station is preferable to a green tariff from a larger energy supplier.

11.4 Preferred Option

Whilst the southern England site appears to be the preferred option the question of PWLB risk remains unresolved. There is a strong possibility that by the time this issue is resolved the southern England site will no longer be available.

Without the southern England site there is little to choose between a directly procured fair value PPA and an asset purchase in terms of the options appraisal exercise.

11.5 Risk Management

The Council's attitude towards risk and reward is likely to be the determining factor in making a decision between the options of a fair value PPA and an asset purchase. Table 15 sets out the key risks and the solutions they apply to.

Table 15: Summary of key risks

Risk Description	Asset Purchase	Fair Value PPA
Achieving the carbon benefits - production (i.e. the risk that specified volumes will not be available)	Low	Low
Flexibility risk – supply arrangement that no longer matches the Council's needs	Low/Medium	Medium/High
Wholesale electricity price inflation risk leading to higher than forecast electricity costs	Low	Medium – after end of PPA
Carbon accounting – additionality	Low	Low
Carbon accounting – permanence	Low	Medium/High
PWLB lending criteria	Possible	Low

11.5.1 Risk consequences and mitigation

This section sets out the impact of risks, the extent to which they are capable of being mitigated and the measures likely to be necessary.

11.5.2 Production Risks

These risks are associated with the ownership of an asset and whether it produces the electricity that was originally expected. The main causes of this risk are set out below together with methods of mitigation.

a. Failure to operate effectively or consistently. Mitigation is via a suitable operation and maintenance contract with an experienced contractor. The contract should include clear specifications of work and availability guarantees. Failure to produce the guaranteed levels of power should be covered in a two-year testing period at the end of the construction contract. Further mitigation can be afforded by the engagement of an asset manager.

b. Irradiance. Overall, there is no significant risk with irradiance as the data available has been collected over many years and is robust. There is however variance year on year in the levels or irradiance. Returns should match those in the original modelling in an average year – but some years will be better than others. Variance is likely to be less than 5% of gross yield.

c. Component failure. The construction contact should provide product warranties for all key components in the early years of the project and this should be managed as part of the operation and maintenance services contract. Ensuring the construction contract has suitable warranties is a key part of the technical evaluation of a project in due diligence.

11.5.3 Flexibility and permanence risks

Flexibility and permanence risks are closely related. The higher the degree of flexibility the lower the level of permanence. Permanence is dependent on how difficult it would be for the Council to reverse its decision and revert to standard grid supplied electricity. It is likely that the green tariff would not be able to demonstrate sufficient permanence to meet the criteria for carbon accounting, unless the contract is for an extended period.

The Council has a commitment to become a carbon neutral organisation by 2038, some 17 years into the future. The Council, in common with most local authorities, currently procures electricity over a much shorter timeframe.

The current short-term nature of electricity procurement does not require the Council to be able to accurately forecast its needs into the future. With estate rationalisation, building energy efficiency measures, electrification of heat and transport all due to take place in the coming years accurate forecasting is likely to be difficult.

All of the options are likely to require the Council to form a reasonable view on likely power requirements in 2038. The consequences under different arrangements are potentially different and are likely to be most manageable under the green tariff scenario. Under a direct PPA agreement it is likely there will be a ‘take or pay’ clause in the contract, committing the Council to a particular volume of supply for the period of the contract. There may be provisions for the council to sell surplus power to a third party if they do not require the power for their own consumption, but this arrangement could be complicated.

Under the asset purchase scenario there would be a need to have a PPA in place to sell power generated where this is in excess of Council requirements. This volume could

potentially be flexible. This leaves and element of price risk and a risk that the asset is significantly larger than the Council's actual requirement. in this circumstance there would be market opportunities to sell the asset either with or without the benefit of a PPA for the Council's ongoing electricity requirement.

11.5.4 Wholesale electricity price risk

Shorter term and more flexible arrangements carry the risk of prices rising faster than forecast and the Council incurring a higher level of spend as a consequence. Price forecast information shared with the Council suggests a real terms price increase in wholesale electricity prices in addition to inflationary increases until around 2035, thereafter there may be real terms reductions in electricity prices.

An asset purchase would tie the Council's electricity costs to a combination of the costs of operation and maintenance, debt and finance repayments and sleeving and balancing costs. This is potentially more predictable and less volatile than energy prices and may provide a higher degree of certainty at lower cost than the other alternatives.

The shorter the term any PPA or green tariff arrangement is, the greater the wholesale price risk. Agreements for 8-10 years may provide a significant variance to market when they end.

11.5.5 Additionality

Both the direct PPA and asset purchase options provide a strong argument for additionality and are therefore robust in carbon accounting terms.

11.5.6 Transparency and traceability

Directly linking supply to a single generating station provides the clearest link in carbon accounting terms and is met by both the direct PPA and the asset purchase options.

Green tariffs are more likely to rely on REGO certificates. Whilst a REGO certificate demonstrates that the supplier has purchased green energy to back this demand it does not provide any degree of assurance where that supply has actually come from (as certificates can be sold independently of supply). The separation of certificates and supplies also allows larger suppliers to direct more green power to direct green tariffs, whilst their standard supply mix becomes increasingly 'brown' as a direct consequence.

11.5.7 PWLB risk

There is no PWLB risk with the PPA options.

There is potential PWLB risk with the asset purchase option. The potential risk lies more around the location of the generating station than the nature of the activity. The ownership of renewable energy generation assets to cover the Council's own use is likely to meet the 'service delivery' criteria in the guidance. The more difficult issue relates to whether any asset would be deemed to be in the Council's Economic Area (and whether these criteria should be strictly applied as in doing so northern authorities would potentially be disadvantaged compared to those with higher levels of irradiance in the south).

11.6 Value for Money

Entering into a PPA or agreement asset purchase is likely to result in a cost reduction when compared to the Council's existing electricity supply arrangements.

Sleeving contracts offer significantly reduced value for money when compared with synthetic PPA agreements and unless there are compelling commercial reasons to use a sleeving contract a synthetic PPA would offer a preferred option.

Asset ownership reduces the price of electricity to the Council by eliminating the margin that would normally go to the owner of the generation asset. This would represent a saving of around 10% on the price currently paid for electricity.

If asset ownership is pursued then schemes in the south of England offer better value for money as the irradiance is higher (see section 3.2) and the £/tCO2e factor is therefore better.

12 Conclusions and Recommendations

12.1 Preferred option

This report sets out a total requirement of around 45 MW of solar PV or an equivalent PPA to enable the Council to meet its 2025 and 2038 targets.

The Council has two potentially attractive options available to it in order to meet the requirement; either the procurement of a suitable asset from a third party, or procurement of a PPA direct with a generating station suitable to meet carbon accounting requirements. There are no realistic options for the Council to meet the full requirement without pursuing one of these strategies. Both of these options represent value for money in relation to a 'do nothing' scenario.

Before a final decision can be made the Council need to understand the magnitude of the PWLB risk. If this risk is significant then the preferred option is clearly a direct PPA with a generating.

If PWLB does not represent a significant risk the Council needs to decide on its appetite for the long-term ownership of a generation asset. This option is likely to represent the best value for money but will require more resource to implement and maintain as well as introducing a new range of (manageable) risks.

12.2 Recommendation

Through this report we have made the following recommendations:

Recommendation 1: The Council should consider adopting a target of 45-50 MW of solar PV generation or equivalent direct PPA with a generating station (wind or solar).

Recommendation 2: All options have positive NPV outcomes when compared with 'do nothing'. There is therefore a solid value for money basis to either enter into a suitable PPA or asset purchase agreement and the Council should therefore change its current supply arrangements.

Recommendation 3: Having undertaken a thorough options appraisal exercise the Council is now able to articulate that asset purchase is a value for money option to achieve its carbon targets and should now explore with HM Treasury whether or not an asset purchase would be compliant with PWLB lending terms.

12.3 Next steps and no regrets actions

In order to deliver the strategy of reducing emissions by 7,000 tCO_2e by 2025, the Council will need to determine its preferred way forward. In order to do that the following are recommended:

1. Develop an understanding of the likely future requirements for electricity over the next decade. This should provide a view as to the likely overall requirements and the degree of certainty which could be attached to this forecast. In all scenarios there is a benefit in having reliable information on which to base assumptions.

2. Follow up established conversations in relation to the use of PWLB to ascertain whether an out of area asset purchase would be allowable under the new prudential regime.

If the Council determines that it wants to pursue an asset purchase strategy, then it will need to put in place measures to allow it to implement that strategy including:

3. Establishing sufficient delegated decision making powers to allow the Council to enter into an exclusivity agreement with a developer and invest in the necessary due diligence work to determine whether a project is a viable prospect.

4. Establish a supplier base to facilitate the due diligence work including technical specialists and lawyers.

5. Develop its financial and carbon modelling to ensure that all costs and benefits for a particular project are understood.

6. Determine whether or not to proceed further with due diligence in relation to any of the large-scale projects identified.

If the Council determines that it wants to pursue a PPA strategy, then it will need to put in place the following:

7. A clear policy in relation to carbon accounting, tested with the Council's advisors in this area, setting out how additionality, permanence and traceability will need to be demonstrated by any procurement.

8. A suitable procurement for a direct 'fair value' PPA agreement.

APPENDIX 1 Income from Electricity Generation - Subsidies and Power Purchase Agreements

Generation subsidies

Subsidy schemes for the generation of renewable electricity have all recently closed. There are however two potential support mechanisms which may be of benefit to the Council if electricity generated is exported. These are Contracts for Difference (CfD) and the Smart Export Guarantee (SEG).

Contracts for Difference

The Government has announced that there will be a 'pot 1' allocation of up to 12 GW in the CfD auction due to take place in late 2021. Pot 1 covers mature technology and includes solar PV and onshore wind. Wind projects generally have better economics than solar PV (especially wind projects in Scotland) and it is therefore unclear at this stage whether any solar PV projects will qualify for the price certainty that CfD brings. Arguably a CfD could also prejudice whether or not any scheme would be an allowable reduction in carbon accounting terms as it would be more problematic to sustain the proposition that the Councils' investment has led to the construction of new capacity.

Smart Export Guarantee Scheme

On 1 January 2020, the Government introduced the Smart Export Guarantee (SEG) scheme, which will enable anaerobic digestion, hydro, micro-combined heat and power (micro-CHP, with an electrical capacity of 50 kW or less), onshore wind and solar PV exporters with up to 5 MW capacity to receive payment for exported electricity. The SEG scheme replaces the feed in tariff (FiT) scheme that closed in Q1 2019. The purpose of the scheme is to guarantee a market for small scale renewable energy generation projects which export power directly to the grid.

Under the SEG scheme all licenced energy suppliers with 150,000 or more customers must provide at least one SEG tariff. The Government has set out that, in order to provide space for the small-scale export market to develop, there will not be any specified minimum tariff rate other than that a supplier must provide payment greater than zero at all times of export. The SEG licensees therefore decide how they want their SEG export tariff to work in terms of its rate, type and length. Storage is also eligible to receive export payments, although suppliers will be able to exclude 'brown' electricity from those payments and require the generator to put metering in place that isolates 'green' exports.

Under the scheme exported power must be metered with a meter capable of reporting exports on a half-hourly basis and meters must also be registered for settlement – though the SEG design is flexible and does not necessarily require half-hourly readings.

Power Purchase Agreements

All schemes will require some form of Power Purchase Agreement (PPA) to sell the electricity produced. It is unlikely that any scheme will secure a PPA at the outset for the life of the project, other than for self consumption by the Council. Different arrangements may apply during the lifespan of the project. This is particularly true under a private wire

arrangement when you need to consider when designing the infrastructure how you will export power to the grid if the arrangement subsequently changes.

Grid export PPAs come in two main forms, either relatively short-term arrangements generally with the major energy suppliers, or longer-term arrangements with a single (or small group) customer. Shorter term arrangements often offer a better spot price than the longer-term ones – but there is more exposure to general price volatility.

Longer term PPA agreements are generally with commercial third parties and seek to fix prices over a set period which helps protect those entering into the PPA (both buyer and seller) from market volatility. Large corporates, such as Google and Amazon have used corporate PPAs for their energy needs. There are currently 260 RE100 companies which have made a commitment to go 100% renewable and are taking actions such as entering into corporate PPA's to deliver on their RE100 and wider sustainability commitments.

Where power is sold as renewable energy the Renewable Energy Guarantees of Origin certificates (REGOs) will be sold with the electricity and therefore any greenhouse gas emissions savings will normally benefit the purchaser of the power rather than the owner of the renewable energy generator.

It is likely that the Council will be the PPA offtaker for an amount of supply equivalent to its electricity consumption. Any surplus power will need to be sold via a PPA agreement.. Key benefits gained from public bodies entering into a PPA with a third-party generator (or their own arm- length generator) are as follows:

Secure energy price - as part of any prudent risk management approach, entering into PPAs provides some insulation against volatile wholesale power markets;

Long term hedge – utilising a PPA gives access to longer date prices;

Additionality/provenance – purchasing directly from a new incremental green generator demonstrates commitment to reducing demand on carbon emitting fuel and provides clear linkage to supply for carbon accounting purposes;

Support UK climate change policy – the UK has made a legal commitment to net zero emissions by 2050. Many local councils have declared climate emergencies and have set targets to achieve carbon neutrality as early as 2030.

PPA structures

Whilst PPA structures continue to evolve there are typically three contract structures:

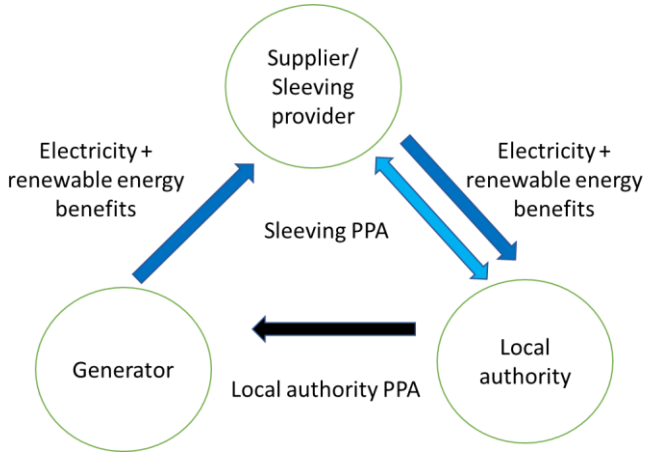
- Physical (also referred to as a 'sleeving' arrangement)
- Synthetic (or virtual)
- Private Wire

Physical PPA

A Physical PPA is between a customer and a generator who are remote from one another. The public electricity network provides the connection and network charges apply. This form of contract provides a direct and verifiable connection between the electricity produced and the electricity consumed.

An overview of the contractual arrangement is shown in Figure 11 below:

Figure 11: Contractual arrangements for a physical PPA with local authority as the off-taker



- Under this structure the off-taker enters into a long term PPA with a renewable energy generator to take some or all of the energy generated by its plant (or portfolio of plants) with a defined amount of power sold at a fixed price per MWh. Typically, the PPA will contain provisions for the sale and purchase of electricity and the allocation of any applicable renewable energy benefits, and the provisions governing that sale and purchase.

- The PPA will also include obligations to provide or procure certain metering and regulatory activities that can only be undertaken by licensed electricity suppliers (such as npower, Centrica etc). As such, the off-taker will need to enter into a back-to-back agreement with its licensed supplier under which the licensed supplier commits to undertake these obligations.

- In parallel to this arrangement the off-taker will have an electricity supply agreement with its licensed supplier under which electricity may be supplied to meet the off-taker's energy demands from time to time. The terms of supply under this supply agreement will take into account the electricity purchased under the PPA and passed through to the licensed supplier under the licensed supplier agreement. This ensures that the off-taker has the benefit of the fixed pricing for renewable energy under the PPA but the reliability of a supply agreement with a licensed electricity supplier to meet its day-to-day energy demands.

- There is generally a charge for the sleeving PPA with the sleeving provider which amounts to around 5% of the value of the wholesale electricity traded.

Both wind and solar developers have built up extensive pipelines of renewable energy projects which can give off-takers flexibility around choosing a PPA start date and the ability to dovetail into their long-term energy buying/risk management strategies. Options also exist for individual public bodies to aggregate smaller volumes to benefit from pricing.

Synthetic PPA

In a synthetic PPA structure no power is physically traded. Instead it is a purely financial structure where the off-taker and generator agree a defined 'strike price' to fix the cost of power between themselves for the power generated by a renewable energy facility. Each

party will then enter into separate agreements with their electricity/licenced supplier to sell/acquire electricity at the spot price.

A synthetic PPA works as a financial hedge in that if the spot price in a settlement period exceeds the PPA defined strike price, the generator pays the excess amount to the off-taker for power generated in that period. Where the market price for power is less than the strike price in a settlement period, then the off-taker pays the shortfall amount to the generator for power generated in that period.

A synthetic PPA is relatively simple to enact and provides price certainty to both parties. It can be harder to demonstrate a direct connection, but this should still constitute a valid carbon reduction for an authority participating as an off-taker, provided the contracts also secure the associated renewable energy accreditations.

Private Wire PPA

Private wire PPAs are concerned with the sale of electricity from a generator to an off-taker. Under this PPA agreement, power will normally be sold directly from the generator's facility to the off-taker, rather than being notionally passed through a national power grid. Typically, the generating facility only supplies power to the off-taker and will be located at, or close to the off-takers assets. Private wire PPAs are often utilised in conditions where the off-taker wishes to secure its own source of power. In the case of a local authority for example, an energy intensive depot or industrial estate owned by the local authority.

APPENDIX 2 – Procurement and risk management

For local authorities looking to own a renewable energy asset there are four basic options:

- Develop a project on owned land
- Develop a project on third party land
- Acquire project rights (land agreements, planning consent and grid connection offer) from a commercial developer prior to construction
- Acquire a fully built and commissioned project

Table 8 below sets out the pros and cons of different the different approaches.

Table 8 – Options for Project Acquisition and Development

Option	Potential Advantages	Things to consider
Self-develop on your own land	• No rental payments • No need to acquire land rights and establish clean title • No onerous restrictions or lease end date • Likely to be within the geographical boundary of the authority	• Is suitable land available • Will you be forgoing an existing income stream? • Do you have another use for the site? • Reputational issues if the site is in proximity to housing or has been promised for another use • Do you have the skills and capacity for the development? • Are you prepared to risk the development costs? • Design, procurement and construction risks to be managed
Develop a site on third party land	• Identify site for its suitability (both size and location) rather than its ownership • Wider search area and therefore more chance of finding a viable grid connection or private wire	• Viability model will need to account for landowner rent • Capacity to acquire the site • Time constraints introduced through the land acquisition period (for example option periods) • Asset lifespan limited by lease arrangements • Do you have the skills and capacity for the development? • Are you prepared to risk the development costs? • Design, procurement and construction risks to be managed • Whether the development is speculative and therefore not able to meet PWLB criteria

Acquire project rights from a third party	• Removes development risk, avoiding potentially abortive costs and providing certainty Land rights, accepted grid offer, and planning consent will be in place significantly reducing capacity required in the authority to deliver the project	• Viability model will need to account for the landowner rent and for costs of acquiring the project rights • Asset lifespan limited by lease arrangements • Design, procurement and construction risks still to be managed • Project rights are well sought after in a competitive market. A local authority can potentially lack credibility as a purchaser compared to a financial institution who has undertaken several similar transactions • Rights are unlikely to be available at a scale or location which is preferable to the authority (bear in mind for example managing construction of a project several hundred miles away) and flexibility may be required
Acquire a completed project from a third party	• Removes development and construction risks, avoiding potentially abortive costs and providing certainty • Land rights, accepted grid offer, planning consent and functioning asset will be in place significantly reducing capacity required in the authority to deliver the project • Private sector developers often prefer to sell post construction and commissioning Private sector contractors can procure more freely and consequently often build at a price significantly lower than the public sector. Quality may also be higher due to ongoing relationships with construction companies	• Viability model will need to account for the landowner rent and for costs of acquiring the project – although this may be less than the combined cost of acquiring project rights and constructing the asset through public procurement • Asset lifespan limited by lease arrangements • Projects are well sought after in a competitive market. A local authority can potentially lack credibility as a purchaser compared to a financial institution who has undertaken several similar transactions • Authorities will only have the ability to bid on existing projects and cannot therefore drive scale or location

Risk Management

Development of renewable energy projects carries a number of risks which need to be managed and mitigated. Key areas of risk are:

1. Development risks – particularly in relation to land rights, availability of grid connection, planning risks and viability. Whilst local authorities possess many of the necessary skills in relation to land rights and planning, they are likely to require specialist support in obtaining and managing grid connection offers and in assessing project viability.

2. Construction and procurement risks – these relate to ensuring that the asset delivers the levels of electrical production anticipated by the business case. Much of this risk can be mitigated by selection of an appropriate form of contract with suitable production guarantees, accompanied by the appointment of a competent technical advisor.

3. Operational risks – these largely relate to ensuring that revenues are as anticipated in the business case. Many of these risks can be mitigated against by appropriate forms of contract, strong technical support, contractual guarantees on availability and appointment of an asset manager.

4. Income risks - These are a combination of production and price. Production risks can be mitigated against by strong build and maintain contracts transferring as much production risk as possible to the contractor.

   Price risk is key in assessing viability. BEIS (Department for Business, Energy and Industrial Strategy) produce forecasts for wholesale electricity prices, but these are not technology specific. It is likely as renewable energy generation becomes more prevalent that differential pricing will prevail, with lower price being offered when there is over production. Local Partnerships use Aurora Energy Research (Aurora) forecast data in the production of financial information and we would recommend that the Council purchases appropriate data from Aurora if they want to proceed with either development or acquisition of a scheme.

APPENDIX 3 – Solar Farm Acquisition Briefing Note

Purpose

This briefing note is to provide the Council with background information about the processes and resource requirements associated with the acquisition, ownership and operation of a solar farm. It is not a definitive guide and has been provided to build general awareness and to aid understanding.

Acquisition Process

At this stage we are concentrating on acquiring a site which will be purchased as it becomes operational, the process may vary (with additional steps) if a shovel ready scheme was being contemplated.

Figure 12 on page 44 sets out the most common route for a transaction of this nature to take, together with tasks to be undertaken during each stage of the process. In general, Stage 1 (initial appraisal) takes 4-8 weeks depending on the urgency of the vendor and speed at which the purchaser is willing to respond.

Stage 2 (due diligence) typically takes around 6-12 weeks to complete depending on how well kept the vendor's records are and how hard the purchaser pushes their contractors.

Stage 3 (completion and commissioning) of the process takes a further two years and ensures that the solar farm produces the electricity guaranteed under the terms of the design and construction contract.

Figure 12: Acquisition process

Council Resources required

This section sets out the key tasks and likely time involvement required at the various stages of acquisition and during the operational phase of the project.

I Acquisition Stage 1: Initial Appraisal

The purpose of this stage is to determine whether you want to make an indicative offer. Resources to support that include the ability to model the potential financial position and the ability to make the decision to make an offer.

The offer is only indicative and can be withdrawn by the purchaser at any time, right through until the point of completion. Equally the vendor can withdraw the site from the transaction, but the exclusivity agreement would prevent them from commencing discussions with any third parties during the exclusivity period. These agreements are generally well honoured within the renewables industry.

Council officers are currently determining the resources required to put the Council in a position to make an indicative offer and ensuring that necessary briefings and decisions are being properly taken.

II Acquisition Stage 2: Due diligence

During this stage the Council will need resources to procure or appoint the following workstreams and to manage input:

1. Land legal advisors to review all land rights associated with the development. This will generally include full legal searches, review of lease and option documentation and the review of all other land rights required to ensure the scheme can be accessed and connected to the grid. Agreements with the network operator will also need to be reviewed to ensure they have been properly entered into. Some vendors (although not all) will provide a certificate of title which simplifies this process to an extent.

   If acquisition is via an assignment of project rights (as opposed to purchase of the SPV) then the land agreements will require assignment to a new target entity.

2. Planning consultants – to review the planning consent and any associated conditions and advise as to whether they have been fully complied with. Advice should be sought as to the extent of any gaps in the compliance and any ongoing requirements the operator of the site will need to comply with.

3. Technical Assessment. Ideally a technical advisor (TA) will be engaged as soon as possible to review the design and forecast output. The TA should provide a full design review and energy yield assessment. In addition, it would be advisable for the TA to monitor construction quality and oversee the testing and handover

procedure under the EPC contract.

4. Grid offer. The grid offer and acceptance should be checked by commercial lawyers to ensure that they have been validly accepted. The grid offer must be novated to the SPV. If acquisition is via an assignment of project rights (as opposed to purchase of the SPV) then a novation agreement will be required from the network operator.

5. Commercial legal and tax advice. This relates to the overall structure of the deal and preparation or review of the transaction documents. There is likely to be a significant commercial input to this dialogue, bringing together any due diligence concerns into conditions precedent being specified in the contracts.

Whilst the technical input can be procured, the Council will need the resource capacity to procure and instruct specialists, project manage the process, negotiate with the developer and write a business case prior to completion of any transaction. It is typical for transactions of this nature to require some negotiation and hands on resolution of issues during the transfer process. Understanding the risks and potential routes to resolution is key to ensuring the transaction either progresses to completion or is terminated at an appropriate stage.

The Council will also need to consider any potential milestone payments and determine whether it has the necessary skills and expertise to certify such payments. These can be supported by the TA if their role is sufficiently scoped.
Alongside the negotiation with the developer, the Council would also need to prepare for owning an operational solar farm – key activities would include:

1. Appointment of an energy supplier and offtaker for the site. Even if you are planning on acquiring the power you will need some form of offtake or sleeving contract. Meters at the site cannot be installed without a supplier appointed (so this may initially be put in place by the vendor – but you will need clear input to the process).

2. Review how and when you can start to purchase the power and put the necessary agreements in place. Put arrangement in place to sell any surplus power.

3. Write the business case and obtain the approvals for the transaction.

Bearing in mind the timescales (i.e. up to 12 weeks), it is a relatively intense process and will require a full-time dedicated officer, with further specialist internal and external support also being required.

III Acquisition Stage 3: Completion and Commissioning

Once the full business case is approved and the contracts exchanged the solar farm will be operational.

The first two years of operation are critical as it is during this time that you can properly assess whether the solar farm is producing the energy guaranteed by the EPC contractor. The Council will need technical support during this period to assess the ongoing testing and to ensure that calculations are properly carried out. This could be

achieved either by extending the services provided by the TA to cover this period or by the appointment of an asset manager.

Asset managers work on behalf of the client and perform an ‘intelligent client’ function. A typical asset manager scope of services includes ongoing optimisation/ analysis, management of the O&M contractor, review of real time monitoring information and accounting, bookkeeping/ filing accounts etc. Generally, this costs around £2,000 - £3,000 per MW pa plus VAT. Whilst an asset management service is not cheap, the costs are often offset by improved performance and income.

The Council will need to determine whether they need and can afford an asset manager and procure a suitable one if required. An asset manager can also be used to help the Council scope an ongoing O&M contract and provide support during the procurement process if required.

Time commitments required will eventually reduce and this is typically achieved by procuring the right support to the project, although these contracts will still require management and periodic re-procurement.

Without an asset manager the solar farm will require around 1 day per week of staff time to monitor outputs, manage bills, etc. With an asset manager the requirement will be less, but there will still be an ongoing requirement of 1 day per month. In addition to this further resource will be required when any agreements need re-procurement, health and safety incidents occur, insurance incidents occur or if there is any other material change in circumstances.

APPENDIX 4 – Review of ground mounted solar PV opportunities on land assets owned by the Council

Site	Commentary regarding suitability for solar PV development
Clayton Vale	Clayton Vale is an area of green space in Clayton, Manchester, through which the River Medlock flows. Former landfill site which was redeveloped in 1986. The area is now a natural habitat for wildlife and it has been designated a Local Nature Reserve
Tweedle Hill/Plant Hill	Tweedle Common is a former landfill site that has been reclaimed as open space. It sits north of Plant Hill Road adjacent to Plant Hill School. It is characterised by relatively flat grass land and some tree planting. Westwards from Plant Hill Park is an expanse of three natural open spaces split by French Barn Lane and Chapel Lane. The site is enclosed on all sides by urban development.
Shack Liffe Green	A former landfill site which was reclaimed in the late 1970's. The site is nestled between the houses of Horncastle Road and Boggart Hole Clough Park. The site has received minimal intervention and as a result now has a very diverse habitat with ecological value.
Queens Road Tip	Ongoing urban development at the site. Forms part of Manchester Fort 2020 Vision and Development Framework. Consideration for battery storage.
Church Lane Church Lane North	Both sites reclaimed as open space containing informal footpaths. Currently used for recreational usage and enclosed on all sites by residential properties.
Matthews Lane	Site forms part of Nutsford Vale which is a park and community wildlife space. The site is located between Matthews Lane and Longsight Road, behind the Gorton Mount and Grange Schools. Former landfill site which has been turned into an area of recreation and wildlife preservation which is managed by The Friends of Nutsford Vale.

Cringle Road	Site is allocated as an Environmental Improvement Area. Enclosed by residential properties and Highfield Country Park.
Ivy Green Road	Restored former landfill site turned into green woodland space. Site joins onto other woods and meadows extending alongside the River Mersey. The site forms part of Chorlton Ees and Ivy Green Nature Reserve.
Parrs Wood Road	Site forms part of the nature reserve of Stenner Woods, Millgate Fields and the River Mersey. Millgate Fields are adjacent to Environment Agency Flood Zones 2 and 3.
Crescent Road	The area is predominantly residential in character. The land area forms part of the Abraham Moss College estate. No firm demand headroom at closest grid connection point (Cheetham Hill (33 kV / 6.6 kV)).
South of Blackley New Road	Former landfill site which was reclaimed and landscaped in the early 1980s. Site forms part of the wider Blackley Vale. Significant levelling works would be required to facilitate the any development. Large pond adjacent to the site.
Russett Road/Factory Lane	Parcel of land contains substantial tree coverage. Forms a tree corridor between residential properties.
Rear of Fairway	Land predominantly consists of substantial tree coverage offset from residential properties. Land contains a network of footpaths. Forms part of Moston Fairway nature reserve which is maintained by the Wildlife Trust.
Graver Lane	Parcel of land contains substantial tree coverage. Forms a tree corridor between residential properties.
Scotland Hall Road	Small land parcel adjacent to four high rise flats. Site area also contains a recreational ground. Enclosed by residential properties and railway line and neighbouring Clayton Vale.
Annie Leigh Playing Fields, Mount Road	Site forms part of Gorton recreational ground, consisting of a children's play area, multi-use games area and football pitches.
Barlow Hall Farm	Site contains substantial tree coverage and is adjacent to Chorlton Water Park, which is a local nature reserve. Installation of a solar farm on the site would require removal of significant areas of

	scrub vegetation. Grid connection would require crossing the River Mersey. Closest grid connection point is South Manchester 132 kV GSP. Connecting a small solar PV scheme at this voltage is unlikely to be viable.
Sand Street, Collyhurst	Small embanked land parcel adjacent high-rise flats. Site enclosed by residential properties.
Rear of Romer Avenue	Parcel of land contains substantial tree coverage. Forms a tree corridor between residential properties.
Fitzgeorge Street	Small land parcel near high rise flats. Enclosed by residential properties, a railway line and urban development.
Riverdale Road, Blackley	Parcel of land contains substantial tree coverage. Forms a tree corridor between residential properties.
Bluestone Road	Small land parcel which lies between a cemetery and allotments.
Joyce Street	Small land parcel. Enclosed by residential properties and a railway line.
High Bank	Small land parcel enclosed by residential properties. Land parcel contains recreational use sports pitches.
Abbey Hey Tip	Small land parcel which forms a corridor between surrounding residential properties.
Harpurhey Road	Small embanked land parcel. Adjacent to weir and reservoir.
Pike Fold Lane	Site contains substantial tree coverage with a network of paths.
Bradford Road, New Viaduct Street, Cambrian Street	Very small land parcel of scrub vegetation enclosed by gas works and railway line. No firm demand headroom at closest grid connection point (Eastlands (33 kV / 6.6 kV)).
Great Ancoats Street	Small land parcel containing significant tree coverage, enclosed by residential properties.
Crabtree Lane, Rear of Eva Bros	Very small land parcel enclosed by urban development and allotments. The site is fairly isolated, however there is no firm demand headroom at the closest grid connection point (Bradford (33 kV / 6.6 kV)).

Princess Road / Kenworthy Farm	Land parcel enclosed by substantial tree coverage forming part of Kenworthy Wood. The site contains a network of walking paths and cycle tracks. Closest grid connection is South Manchester 132 kV GSP. Connecting a small solar PV scheme at this voltage is unlikely to be viable.
Princess Parkway	Site currently forms part of Northenden golf club.
Airport Woodhouse Park	Very small isolated land parcel. Consideration for battery storage.
Former Stockport Branch Canal Footpath	Canal footpath
Bradford Gas Works	Existing car park area adjacent to the Etihad Stadium. No firm demand headroom at closest grid connection point (Eastlands (33 kV / 6.6 kV)) to support solar PV. Consideration for battery storage connecting into the Bradford (33 kV / 6.6 kV) substation.

Site	Ground Mounted Solar PV				Grid Management Services
	Land Size, location and access	Planning	Technical	Grid Firm demand availability for solar PV, connection length, connection voltage	Potential for Grid Management Services
Clayton Vale					
Tweedle Hill/Plant Hill					
Shack Liffe Green					
Queens Road Tip					
Church Lane					
Church Lane North					
Matthews Lane					
Cringle Road					
Ivy Green Road					
Parrs Wood Road					
Crescent Road					
South of Blackley New Road					
Russett Road/Factory Lane					
Rear of Fairway					
Graver Lane					
Scotland Hall Road					
Annie Leigh Playing Fields, Mount Road					
Barlow Hall Farm					
Sand Street, Collyhurst					
Rear of Romer Avenue					
Fitzgeorge Street					
Riverdale Road, Blackley					
Bluestone Road					
Joyce Street					
High Bank					
Abbey Hey Tip					
Harpurhey Road					
Pike Fold Lane					
Bradford Road, New Viaduct Street,Cambrian Street					
Great Ancoats Street					
Crabtree Lane, Rear of Eva Bros					
Princess Road / Kenworthy Farm					
Princess Parkway					
Airport Woodhouse Park					
Heaton Park					
Former Stockport Branch Canal Footpath					
Bradford Gas Works - **solar carport**					
Land south of Wythenshawe Hospital					

Contact details
Jo Wall, Strategic Director, Local Partnerships
Email: jo.wall@localpartnerships.gov.uk
Tel: 07985 476 697

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Manchester City Council
Report for Resolution

Report to:	Environment and Climate Change Scrutiny Committee – 14 October 2021 Executive – 20 October 2021
Subject:	Large Scale Renewable Energy Generation Feasibility Summary Study
Report of:	The Deputy Chief Executive and City Treasurer

Summary

The Council's Climate Change Action Plan (CCAP) has a target to reduce direct emissions of CO2 by 50% over the five-year period of 2020-25. In addition, the Council has a target to be zero carbon by 2038.

Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 by 2025 savings to be delivered via a **"**feasibility and business case for a large-scale energy generation scheme from large scale Solar PV or Onshore or Offshore Wind on Council land and buildings, or sites in third party ownership".

Local Partnerships were appointed in November 2020 to deliver the feasibility study and their study, **"Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council",** was completed in April 2021 and is attached as Appendix 1 to this paper.

The Feasibility Study concluded that the Council has two options: either purchase a solar PV facility or negotiate a suitable power purchase agreement (PPA). Both options were assessed to be better than the "do nothing" option.

Recommendations

The Environment and Climate Change Scrutiny Committee is:

1. Invited to comment on the report and note the options in Section 3.1 available to the Council; and
2. Endorse the recommendation that the Executive is asked to agree that the Deputy Chief Executive and City Treasurer and the Chair of the Zero Carbon Coordination Group establish a delivery team to develop the options further, with a view to returning to the Executive with a proposal.

The Executive is asked to:

1. Note the options in Section 3.1 available to the Council; and
2. Agree that the Deputy Chief Executive and City Treasurer and the Chair of the Zero Carbon Coordination Group establish a delivery team to develop the options further, with a view to returning to the Executive with a proposal.

Wards Affected: All

Environmental Impact Assessment - the impact of the decisions proposed in this report on achieving the zero-carbon target for the city
Action 1.4 of the Council's Climate Change Action Plan 2020-25 targets 7,000 tonnes of annual CO_2 savings by 2025. The CCAP sets out the actions that will be delivered to ensure that the Council plays its full part in delivering the city's Climate Change Framework 2020-25 which aims to half the city's CO_2 emissions over the next 5 years.

Our Manchester Strategy outcomes	**Contribution to the strategy**
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	The transition to a zero carbon city will help the city's economy become more sustainable and will generate jobs within the low carbon energy and goods sector. This will support the implementation of the Our Manchester Industrial Strategy and Manchester Economic Recovery and Investment Plan.
A highly skilled city: world class and home grown talent sustaining the city's economic success	Manchester is one of a small number of UK cities that have agreed a science-based target and is leading the way in transitioning to a zero carbon city. It is envisaged that this may give the city opportunities in the green technology and services sector.
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	Transitioning to a zero-carbon city can help to tackle fuel poverty by reducing energy bills. Health outcomes will also be improved through the promotion of more sustainable modes of transport and improved air quality.
A liveable and low carbon city: a destination of choice to live, visit, work	Becoming a zero carbon city can help to make the city a more attractive place for people to live, work, visit and study.
A connected city: world class infrastructure and connectivity to drive growth	A zero carbon transport system would create a world class business environment to drive sustainable economic growth.

Full details are in the body of the report, along with any implications for

- Equal Opportunities Policy
- Risk Management
- Legal Considerations

Financial Consequences – Revenue
It is expected that the Revenue requirements needed to take this forward will be met from existing directorate budgets; if this is not possible, the financial consequences will be that an additional funding requirement is needed to establish a delivery team, including the cost of engaging the necessary external technical support.

Financial Consequences – Capital
It is not expected that there will be any immediate financial consequences to the Capital budget from the content of this report. However, it should be recognised that the outcome of the report options will have capital cost implications.

Contact Officers:

Name: David Houliston
Position: Strategic Lead Policy and Partnerships
Email: d.houliston@manchester.gov.uk

Name: Mark Duncan
Position: Strategic Lead - Resources & Programmes
Email: mark.duncan@manchester.gov.uk

Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council – Local Partnerships (April 2021)

1.0 Introduction

1.1 Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 savings via a "feasibility and business case for a large-scale energy generation scheme from large scale Solar PV or Onshore or Offshore Wind on Council land and buildings, or sites in third party ownership".

1.2 Local Partnerships were appointed in November 2020 to deliver a Feasibility Study. A working group to inform, support and manage the study was established led by the Deputy Chief Executive with officers from Estates, Commercial Services, Financial Services and the Zero Carbon Team.

1.3 The Local Partnerships brief was to consider:

- The amount of energy generation assets required to deliver the 7,000 tCO_2 annual savings.
- The size and type of assets with the potential to deliver this, including options for Council-owned land and buildings, partnerships with other land and building owners or developers in the city as well as options both within and beyond the city boundary and Greater Manchester.
- Funding and financing options including prudential borrowing, private financing, government grants etc.
- The range of operating models available including power purchase agreements (PPAs), own and operate, etc.
- The opportunity to deliver maximum, medium to long-term benefits for the Council in both commercial and climate action terms to, and beyond, 2025.
- An assessment of the risks and benefits of individual opportunities.
- The Council's current and future capacity to deliver, including the administrative and specialist capacity requirements for the development, procurement, commissioning and operation.
- An assessment of the different business models available in terms of investment cost, commercial risk and speed of deliverability supported by an option appraisal on Net Present Value (NVP), using commercially available data.

1.4 The study, **"**Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council", was completed in April 2021.

1.5 Progress updates were presented to SMT in August and December 2020 and the final study was presented to SMT in June 2021. A briefing was held with the Leader, Cllr Craig and Cllr Rawlins on the 8th September 2021.

2.0 Key findings of the Feasibility Study and Next Steps

2.1 Solar PV is recommended as the most appropriate renewable technology. Onshore wind developments are very limited in availability and are often subject to planning challenges. Offshore wind is generally too large a scale to be suitable.

2.2 The size of requirement needed to deliver 7,000 tCO_2 annual savings is equivalent to ~33MW of solar PV. To deliver benefits beyond this point and contribute more significantly to the Council meeting its target to be zero carbon by 2038, then ~45-50MW of solar PV would be required. The Council should consider adopting this size of requirement to future-proof residual emissions through to 2038, facilitating an earlier reduction of a greater proportion of the Council's (Scope 2) electricity emissions and maximising the potential for carbon reduction through renewable energy.

2.3 The Council has maximised capacity on its own buildings for renewable energy generation. 6.67MW is already scheduled to be installed via roof-mounted solar PV installations on the Council's estate. These are being delivered by Phase 1 of the Estates Carbon Reduction Programme, the Public Sector Decarbonisation Fund and the ERDF Unlocking Clean Energy project. The generation from these schemes is already accounted for in the CCAP.

2.4 There is no suitable land in Council ownership to deploy 45-50MW of solar capacity. An area of ~100 Ha of land is required to deliver the 7,000 tCO_2 requirement. The study examined 35 historic landfill sites across the city, concluding that many had been reclaimed as amenity spaces or were not suitable due to location issues, e.g. proximity to housing. They also looked at opportunities at Heaton Park and the adjacent reservoir, both excluded due to land use and heritage status. The study also explored Council-owned land adjacent to Wythenshawe Hospital which was excluded as it is allocated for employment in the spatial framework. Manchester Climate Change Partnership (MCCP) members were also canvassed and there was a review of planning applications to identify any schemes submitted with potential partnership opportunities.

2.5 No opportunities were identified within Manchester for a partnership project. Two ground mounted solar projects are planned in Rochdale (5MW) and in Salford (1.7MW). The size of these schemes is not large enough to facilitate collaboration. No other third-party developments were identified for acquisition.

2.6 Since the publication of the feasibility study, the GMCA Go Neutral project has assessed opportunities for small-scale renewable energy assets across the city-region. Based on initial findings it is estimated that ~7-14MW of additional capacity could be available on Council-owned buildings and small parcels of land in Manchester.

2.7 The feasibility study concludes that the Council needs to look out of area to deliver the required size of generation, given there is no local opportunities for solar PV at the required scale. Additionally, the study noted that where levels of irradiance are higher, solar PV schemes deliver a better return on investment (ROI). Irradiance levels are potentially 13% higher in the south of the UK compared to Manchester and would generate a higher ROI.

2.8 To provide the Council with a deeper understanding of the available options, Local Partnerships used data from Aurora Energy Research (provider of commercial modelling and forecasting data for renewable technologies) to

generate an options appraisal based on current and forecasted pricing. The Net Present Value (NPV) calculations were appraised over an 8 year and a 25-year period and were compared to a 'do nothing' scenario, i.e. the Council's current green tariff.

2.9 This calculation showed that all options have positive NPV outcomes compared with 'do nothing'. There is a solid value for money basis to either enter into a suitable PPA or asset purchase agreement and the Council should therefore seek to change its current supply arrangements.

2.10 A budget of £27m–£30m is the estimated cost for an asset purchase. A solar asset is anticipated to have a life of 35-40 years. Should this option be selected, and a suitable facility identified, the Council would need to be prepared to move at speed as the numbers of projects of this kind coming to market are relatively few and are likely to be in high demand.

2.11 To progress effectively, we are bringing together a project team that incorporates appropriate internal capacity within our Corporate Landlord functions (including our Energy Management and Facilities Management Teams). We will supplement this by securing appropriate expert advice to implement the recommendations around purchase of a solar facility twin-tracked with a PPA. This twin-track approach allows us to progress the two recommended options in line with the findings of the feasibility study and is necessary to allow us to make the right purchase to meet our needs within the CO2 targets and timescales set in our Climate Change Action Plan.

2.12 The project team will develop a business plan which will be brought back to Executive to secure the appropriate approvals that will allow us to make any future asset purchase and / or enter into a PPA in a timely and effective manner.

3.0 Recommendations

3.1 The Council will act on the findings of the feasibility study and undertake work to deliver the purchase of a solar PV facility, and alongside this, develop options to enter into suitable Power Purchase Agreements (PPAs). This twin-track approach is to ensure we meet the overall objective of reducing the overall emissions target as the availability of solar sites of the size required is dependent on market availability and the PPA option is also needed to ensure we can meet the target in full within the timescales set in the Climate Change Action Plan.

3.2 Carol Culley, as Deputy Chief Executive and Chair of the Zero Carbon Coordination Group is delegated to establish a delivery team which builds on existing Council capacity and skills and draws in necessary external experts to develop the options, with a view to returning to the Executive with a proposal having carried out appropriate due diligence work on these options.

4.0 Contributing to a Zero-Carbon City

4.1 Action 1.4 of the CCAP targets 7,000 tonnes of annual CO_2 savings by 2025 and is a key action to ensure that the Council plays its full part in delivering the city's Climate Change Framework 2020-25 which aims to half the city's CO_2 emissions over the next 5 years.

5.0 Contributing to the Our Manchester Strategy

(a) A thriving and sustainable city

5.1 The transition to a zero carbon city will help the city's economy become more sustainable and will generate jobs within the low carbon energy and goods sector. This will support the implementation of the Our Manchester Industrial Strategy and Manchester Economic Recovery and Investment Plan.

(b) A highly skilled city

5.2 Manchester is one of a small number of UK cities that have agreed a science-based target and is leading the way in transitioning to a zero carbon city. It is envisaged that this may give the city opportunities in the green technology and services sector.

(c) A progressive and equitable city

5.3 Transitioning to a zero-carbon city can help to tackle fuel poverty by reducing energy bills. Health outcomes will also be improved through the promotion of more sustainable modes of transport and improved air quality.

(d) A liveable and low carbon city

5.4 Becoming a zero carbon city can help to make the city a more attractive place for people to live, work, visit and study.

(e) A connected city

5.5 A zero carbon transport system would create a world class business environment to drive sustainable economic growth.

6.0 Key Policies and Considerations

(a) Equal Opportunities

6.1 There are no equal opportunity issues to note that should arise from the content of this report.

(b) Risk Management

6.2 The key risk is to successful delivery of the Council's Climate Change Action Plan as action 1.4 is targeted to generate 7,000 tonnes of annual CO_2 savings by 2025 and the earlier this is delivered, the greater the contribution to staying within the carbon budget for the five year period.

(c) Legal Considerations

6.3 The legal issues to note from the content of this report are that in regard to a an asset purchase, PPA or a hybrid it will be necessary to consider the relevant public contracts regulations and the Council's own Contractual Standing Orders in regard to procurement and the processes associated with procurement and associated decision making along with relevant decision making processes for the acquisition of an asset and any agreements entered into in association with any proposal. In this regard appropriate delegated decision making powers and approvals will also need to be considered. Legal Services will provide support and advice in regard to such matters and also in regard to the recommendations in this report seeking such appropriate expert technical and professional support and advice as shall be appropriate.

Appendices

Appendix 1 – Feasibility Study and Options Appraisal for Large Scale Energy Generation for Manchester City Council – Local Partnerships (April 2021)

Manchester City Council
Report for Information

Report to: Environment and Climate Change Scrutiny Committee – 13 January 2022

Subject: Overview Report

Report of: Governance and Scrutiny Support Unit

Summary

This report provides the following information:

- Recommendations Monitor
- A summary of key decisions relating to the Committee's remit
- Items for Information
- Work Programme

Recommendation

The Committee is invited to discuss the information provided and agree any changes to the work programme that are necessary.

Wards Affected: All

Contact Officers:

Name: Lee Walker
Position: Scrutiny Support Officer
Telephone: 0161 234 3376
Email: lee.walker@manchester.gov.uk

Background documents (available for public inspection): None

1. Monitoring Previous Recommendations

This section of the report lists recommendations made by the Environment and Climate Change Scrutiny Committee. Where applicable, responses to each will indicate whether the recommendation will be implemented, and if it will be, how this will be done.

Date	Item	Recommendation	Response	Contact Officer
13 January 2021	NESC/21/06 Monitoring and Compliance – Construction Sites	Recommend that Officers, in consultation with the Executive Member for Environment, Planning and Transport arrange a briefing session for Members of the Committee that provides an overview of a range of activities that included, but not restricted to planning and related enforecment; roles and responsilibities and Traffic Regulation Orders.	A response to this recommendation has been requested and will be reported back once received.	Julie Roscoe Director of Planning, Building Control and Licensing
22 July 2021	ECCSC/21/11 Climate Change Action Plan Quarterly Progress Report: Q1 April - June 2021	That every school on a main arterial route with high volumes of traffic have a tree planting plan included as part of the tree strategy to promote clean air.	A response to this recommendation has been requested and will be reported back once received.	Julie Roscoe Director of Planning, Building Control and Licensing
14 October 2021	ECCSC/21/21 Climate Change Action Plan Quarterly Progress Report, Q2 July - September 2021	1. The Executive Member for Environment give consideration to establishing a Climate Clock in the city, similar to that in Glasgow; 2. The Executive Member for Environment and Officers arrange a briefing session for Members on the	A response to these recommendations has been requested and will be reported back once received.	Cllr Rawlins Executive Member for Environment

		modelling that was used to agree and set the suite of targets reported in the Action Plan.		
11 November 2021	ECCSC/21/21 Approach to Flood Prevention and Management	That a visit be arranged for Members of the Committee to witness the flood management arrangements in the Goyt Valley.	This recommendation is being progressed. Members will be notified of any arrangements.	Lee Walker Scrutiny Support Officer
9 December 2021	ECCSC/21/33 Aviation and Carbon Emissions	1. That the Executive Member for the Environment convene a meeting with Members of the Committee to discuss further the issues raised at the meeting.	The Executive Member for Environment is progressing this recommendation.	Cllr Rawlins Executive Member for Environment
		2. That the Chair discusses with the Chairs of the Economy Scrutiny and Communities and Equalities Scrutiny Committee the request for the consideration of the issue of the airport within their respective remits and focus.	The Executive Member for Environment has advised that a suite of reports will be considered at each scrutiny Committee.	Councillor Igbon
		3. That a report on both Staff Active Travel Plans and Member Active Travel Plans be submitted for consideration at an appropriate time.	The Executive Member for Environment has advised that Active Travel is considered by the Economy Scrutiny Committee.	Cllr Rawlins Executive Member for Environment
		4. That the Executive Member for Environment lobby Government to appropriately fund and incentivise electric vehicle parking and charging at all airports.	The Executive Member for Environment has advised that this recommendation has been noted.	Cllr Rawlins Executive Member for Environment

		5. That the Executive Member for Environment lobby Government to fund and incentivise the conversion to electric vehicles for those industries and business whose vehicles do not access the public highways.	The Executive Member for Environment has advised that this recommendation has been noted.	Cllr Rawlins Executive Member for Environment
9 December 2021	ECCSC/21/34 Grounds Maintenance Update: The Use of Pesticides	1. That a briefing note be prepared by Officers that describes the approach taken by other Local Authorities to stop using Glyspohate and the alternate methods of weed control adopted. 2. That a briefing note be prepared by Officers that describes the approach taken by local Registered Housing Providers to reduce their use of Glyspohate and the alternate methods considered to control weeds.	The Executive Member for Environment has advised that both of these recommendations have been noted and work has begun to provide a response to these.	Heather Coates in consultation with Cllr Rawlins, Executive Member for Environment

2. Key Decisions

The Council is required to publish details of key decisions that will be taken at least 28 days before the decision is due to be taken. Details of key decisions that are due to be taken are published on a monthly basis in the Register of Key Decisions.

A key decision, as defined in the Council's Constitution is an executive decision, which is likely:

- To result in the Council incurring expenditure which is, or the making of savings which are, significant having regard to the Council's budget for the service or function to which the decision relates, or
- To be significant in terms of its effects on communities living or working in an area comprising two or more wards in the area of the city.

The Council Constitution defines 'significant' as being expenditure or savings (including the loss of income or capital receipts) in excess of £500k, providing that is not more than 10% of the gross operating expenditure for any budget heading in the in the Council's Revenue Budget Book, and subject to other defined exceptions.

An extract of the most recent Register of Key Decisions, published on **31 December 2021**, containing details of the decisions under the Committee's remit is included overleaf. This is to keep members informed of what decisions are being taken and to agree, whether to include in the work programme of the Committee.

Subject / Decision	Decision Maker	Decision Due Date	Consultation	Background documents	Officer Contact
Large Scale Renewable Energy Generation (2021/11/29C) Grant appropriate delegation for the Deputy Chief Executive and City Treasurer to enter negotiations for either: • the development or purchase of a	Chief Executive	19 January 2022		Report of the Deputy Chief Executive and City Treasurer	Name: Matthew Bennett Position: Director of Commercial and Operations Tel no: 0161 234 3379 Email address: matthew.bennett@manchester.gov.uk Name: Mark Duncan Position: Strategic Lead -

Subject / Decision	Decision Maker	Decision Due Date	Consultation	Background documents	Officer Contact
suitable large-scale solar PV facility • a suitable direct Power Purchase Agreement					Resources & Programmes Tel no: 0161 234 3466 Email address: mark.duncan@manchester.gov.uk

Environment and Climate Change Scrutiny Committee
Work Programme – January 2022

Thursday 13 January 2022, 10:00 am (Report deadline Friday 31 December 2021)

Item	Purpose	Lead Executive Member	Lead Officer	Comments
Climate Change Action Plan - Quarterly Update report	To receive and comment upon the Manchester Climate Change Action Plan quarterly update report.	Cllr Rawlins	Sarah Henshall Mark Duncan	
Large Scale Renewable Energy Generation	To receive a progress report on the project to deliver Large Scale Renewable Energy Generation, having previously considered the report 'Large Scale Renewable Energy Generation Feasibility Summary Study' at the meeting of 15 October 21.	Cllr Rawlins	David Houliston Mark Duncan	Executive Report
Food Sustainability	To receive a report that provides an update on the work undertaken to support communities around the area of food sustainability and to provide an update on the work of the Manchester Food Board.	Cllr Rawlins	Barry Gillespie	
Overview Report	This is a monthly report, which includes the recommendations monitor, relevant key decisions, the Committee's work programme and any items for information.		Lee Walker	

Thursday 10 February 2022, 10:00 am (Report deadline Monday 31 January 2022)

Item	Purpose	Lead Executive Member	Lead Officer	Comments
Budget proposals 2022/23 - update	Consideration of the final budget proposals that will go onto February Budget Executive and Scrutiny and March Council.	Cllr Craig Cllr Akbar Cllr Rawlins	Carol Culley	
Green and Blue Infrastructure Strategy	To receive an update report on the Green and Blue Infrastructure Strategy. This report will also provide an update on the implementation of the Manchester Tree Strategy.	Cllr Rawlins	Julie Roscoe	
Manchester Climate Change Framework and Implementation Plan 2.0	To receive and comment upon the Draft Manchester Climate Change Framework 2.0.	Cllr Rawlins	Manchester Climate Change Partnership and Agency	
Overview Report			Lee Walker	

Items to be scheduled				
Item	**Purpose**	**Lead Executive Member**	**Lead Officer**	**Comments**
Local Energy Area Plan	To receive a report that provides information on the Local Energy Area Plan. Local Area Energy Planning (LAEP) is a process which has the potential to inform, shape and enable	Cllr Rawlins	Michael Marriott Mark Duncan	

	key aspects of the transition to a net zero carbon energy system. Local Area Energy Planning was developed by Energy Systems Catapult			

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