Item 1

15th April 2025

Glasgow City Council

Net Zero and Climate Progress Monitoring City Policy Committee

Report by George Gillespie, Executive Director of Neighbourhoods, Regeneration and Sustainability

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UPDATE ON PROGESS OF PHASE 1 OF SOLAR PV INSTALLATION

Purpose of Report:

To provide Committee with an update on the program of photovoltaic solar installations on the Glasgow City Council estate.

Recommendations:

The Committee is asked to:

1) Note the contents of this report.
2) Note the progress of phase 1 of the solar PV installation and the revised timescale for completion.
3) Note the feasibility and financial preparations for future phases.
4) Note that further updates will be provided to Committee on an annual basis.

Ward No(s): Citywide: ✓

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

1. Introduction

1.1 The Glasgow Climate Plan sets the ambitious target of the City being net zero carbon by 2030. The third iteration of the Glasgow City Council Carbon Management Plan (CMP3) supports the Council's journey towards net zero carbon by aligning our own estate and activities with the wider city target.

1.2 CMP3 sets a target to reduce direct emissions by at least 80% by 2030. How the Council heats and powers its buildings (with electricity, gas and oil) accounts for the majority of measurable emissions (74%). Therefore, reducing the amount of energy consumed and decarbonising the energy used by the Council estate is a key focus for the CMP3.

1.3 Solar photovoltaic (PV) power generation is a proven renewable energy technology that, when retrofitted on the Council estate, delivers annual reductions in emissions associated with the Council's electricity usage. It also reduces the Council's overall energy costs through provision of free energy following return on investment, and protects the council from energy price fluctuations. Whilst the national grid is progressing towards decarbonisation, use of zero emission local generation at the point of consumption, accelerates carbon reduction and contributes directly to the Council and City's emission reduction targets.

1.4 Prior to the development of the current phase of solar PV installation, GCC operated 33 roof-mounted PV arrays of varying size and generation capacity, measured in kilowatt peak (kWp)[1] and kilowatt hours (kWh)[2] respectively. The number of installations, and therefore generation capacity, had risen in recent years. In 2016 around 285,000 kilowatt hours (kWh) of PV generation was recorded, rising to approximately 616,000 kWh in 2023.

1.5 An update paper detailing project funding, the proposed phased approach, including phase 1 buildings, and intentions for future phases was presented at the Net Zero and Climate Progress Monitoring City Policy Committee meeting of 16th April 2024. This paper detailed that the Phase 1 installation programme would introduce eight additional arrays with a collective size of 992 kWp and annual generation capacity of 700,000 kWh when complete. This more than doubles the existing 926 kWp of total solar arrays on the Council estate.

2 Funding and Procurement

2.1 The PV installation programme set out to maximise energy generation, emission reduction, and financial savings to the council via the use of the £2 million capital funding previously approved for solar PV as part of the 22/23 capital Investment Options (22GF47) and presented to the Net Zero and Climate Progress Monitoring City Policy Committee, 23rd May 2023.

[1] The maximum amount of power produced under standard laboratory test conditions, which broadly equate to bright sunshine.
[2] A measure of electrical energy equivalent to a power consumption of one thousand watts for one hour.

2.2 Funding was further enhanced by use of match funding from Salix. Salix is a non-departmental public body, owned wholly by Government. Salix administers funds on behalf of the Department for Energy Security and Net Zero, the Welsh and Scottish Governments, and the Scottish Funding Council.

2.3 GCC successfully secured a Salix loan of £522,302 which constitutes circa 50% of the funding for phase 1 of the programme. Both GCC and Salix funding will be repaid using the savings generated via the reduction in electricity purchased from the national grid.

2.4 The electricity output of the phase 1 locations has been modelled using sunlight irradiation data for the Glasgow area and has been adjusted for orientation of the buildings. This approach indicates a payback period of approximately 6 years[3] based on estimated savings. Increased electricity costs, improved PV efficiency, and a reduction in PV costs have reduced the effective payback period for PV installations. As the technology is designed to operate in excess of 25 years, this provides a significant period of zero cost and net zero generation post return on investment. Based on the modelled annual yield and at current prices, phase 1 should achieve estimated electricity cost savings of £182,000 per year.

2.5 An Invitation To Tender (ITT) was issued in respect of phase 1, with the submissions received assessed. The contract for final design and installation of the PV arrays awarded to Vital Energi on 15th April 2024.

3 PV Installation – Phase 1

3.1 The eight buildings identified as part of phase 1 are shown in the table below. This includes the proposed PV array at each with the array size and modelled annual yield[4]:

Location	Array Size (kWp)	Expected Annual Generation (kWh)	Actual Installation Cost (£)	Status
Kelvinhall	600	381,000	613,094[5]	In progress
Dalmarnock Primary School	130	108,550	126,876	Complete
Haghill Primary School	50	41,750	67,537	Complete
St Bernards primary School	50	38,100	66,679	Complete

[3] Across all eight locations
[44] Modelled Annual Yield is the amount of electricity that can be generated adjusted for geographical and seasonal changes to the Sun's position.
[5] Predicted – installation not yet complete.

Location	Array Size (kWp)	Expected Annual Generation (kWh)	Actual Installation Cost (£)	Status
Camstradden Primary School	50	40,600	64,890	Complete
Muirhead Rd Day Care Centre	32	25,984	38,089	Complete
Mallaig Rd Day Care Centre	32	25,984	37,963	Complete
Castleton Primary School	51	39,312	63,817	Complete

3.2 Following design and procurement activities, installation of the solar PV arrays at the seven education and social work properties (excluding Kelvinhall) began on 24th October 2024 and were completed on 29th November 2024. These installations are now fully operational, providing electrical generation directly supplementing the requirements of the individual buildings, reducing the requirement for purchasing power from the national grid and reducing the carbon emissions associated with normal building use and operations.

3.3 Installation of the solar PV array at Kelvinhall commenced on 13th January 2025. Due to the size and complexity of the Kelvinhall, with the installation expected to be the largest roof-mounted solar array in Scotland, design and installation access requirements have resulted in a delay in the original expected completion date of end of February. However, work with the contractors and all building stakeholders has resulted in a revised expected completion date for this installation of 23rd May 2025.

4 PV Installation – Future Phases

4.1 Detailed feasibility studies have been undertaken for the installation of solar PV at a further 38 GCC properties. The locations comprise a variety of service areas included a mix of Education, HSCP, NRS and Glasgow life locations.

4.2 It is estimated that these locations could contribute approximately a further 4 MWp[6] of solar generation and represent a considerable increase in PV generation capacity across the Glasgow Council building estate. Upon completion these have the potential to deliver almost 3.2 GWh of electricity per annum saving over 715 tCO_2e[7]. At current electricity prices this equates to over £830k in annual savings with higher savings expected in the event of rises in the cost of grid-supplied electricity.

[6] 4MWp = 4,000kWp = maximum amount of power produced under standard laboratory test conditions, which broadly equate to bright sunshine.

[7] Based on 0.225 $kgCO_2e$/kWh including transmission loses.
https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

4.3 Delivery of the above installations is estimated to cost approximately £8.5 million. Funding options are being actively explored and will include the residual capital funding available following completion of phase 1, additional capital funding identified by the 2024 Council Budget, community municipal investments, and potential additional external funding, including potential capital investment identified through the EU Net Zero Cities Mission and further interest free loans from Salix. Further Salix funding is expected to be available with the extent of this for financial year 2025 / 26 yet to be confirmed.

4.4 Pre-feasibility studies assessments have been undertaken into the remaining GCC estate with 146 additional properties identified as potentially suitable for solar PV installation. More detailed feasibility and financial assessments will be undertaken to identify a pathway to installation for these and any other suitable properties.

5 Next Steps

5.1 NRS Sustainability will continue to manage delivery of phase 1 of the project, to complete the Kelvinhall installation according to the revised schedule.

5.2 NRS Sustainability will progress the exploration of financial options and the procurement and delivery pathway for progression of the solar PV installation at the sites subject to full feasibility assessment. NRS Sustainability will continue to work with Salix and other external bodies to maximise the funding available for this and any future phases.

5.3 NRS Sustainability will continue to review all GCC locations with the intent to maximise financial and carbon emission benefits from the Council estate and use the information to develop a full program of PV installation, potentially in conjunction with other energy and carbon reduction actions where appropriate.

5.4 A further update on the progress of solar PV installation on the Council estate will be included within the Carbon management plan updates to Committee.

6. Policy and Resource Implications

Resource Implications:

Financial:	There are no direct financial implications arising from the report.
Legal:	The report raises no direct legal issues.
Personnel:	GCC Sustainability, ALEOs, Corporate Asset Management will all have involvement in project initiation, development and operational aspects.

Procurement:	Procurement resources will be required for the tender process.
Council Strategic Plan:	Contributes to Grand Challenge 3 - *Fight the Climate Emergency in a Just Transition to a Net Zero Glasgow* and Mission 2 - *Become a net zero carbon city by 2030*
Equality and Socio-Economic Impacts:	
Does the proposal support the Council's Equality Outcomes 2021-25? Please specify.	Not directly. However reducing the Council's utility costs and liability may free up financial resources that could be focused on the Council's equality objectives.
What are the potential equality impacts as a result of this report?	No significant impact.
Please highlight if the policy/proposal will help address socio-economic disadvantage.	Financial benefits to the Council and increased employment opportunities represent positives in this respect.
Climate Impacts:	
Does the proposal support any Climate Plan actions? Please specify:	This project provides a specific response to action 17 of the Climate Plan. Also contributes to many of the actions within the Climate Plan, including actions 3, 6 and 49.
What are the potential climate impacts as a result of this proposal?	A reduction in carbon emissions relating to the electricity usage in buildings through use of zero emission generation.
Will the proposal contribute to Glasgow's net zero carbon target?	By reducing emissions relating to the electricity usage of buildings, this project will have a direct positive impact on Glasgow's net zero carbon target.
Privacy and Data Protection Impacts:	Not directly applicable to this report.

7. Recommendations

7.1 The Committee is asked to:

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