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## NORTH AYRSHIRE COUNCIL

26 January 2021

### Cabinet

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**Title:** Solar PV Farm Proposal

**Purpose:** To inform Cabinet of the outcome of investigations into the potential and viability of developing ground mounted solar photovoltaic (PV) farms at two Council owned sites and to seek approval for the proposed installation of a solar PV farm at Nethermains former landfill site.

**Recommendation:** That Cabinet:

- a. Notes the investigations into the viability of constructing ground mounted solar photovoltaic (PV) farms on Council owned land at two former landfill sites at Nethermains and Shewalton;
  - b. Approves the development of a solar PV farm installation at Nethermains former landfill site;
  - c. Notes the Nethermains solar PV farm proposal will require an estimated total initial investment of £6.768m which will be part funded utilising £4.5m of capital funding from the Council's approved £8.8m Investment Fund;
  - d. Agrees that the remaining required funding of £2.268m will be included in the proposed refreshed Capital Investment Plan to be considered by Council in March 2021 as part of the budget setting process;
  - e. Notes the options available for revenue generation from the energy created from the proposed Nethermains solar PV farm and authorises the Executive Director of Place together with the Head of Finance to further investigate and conclude final contractual arrangements;
  - f. Notes the associated community benefits funding that the project will create for disbursement under existing policy and mechanisms;
  - g. Notes that the potential for a Shewalton solar PV farm and other renewable energy opportunities will continue to be investigated and will be reported to a future Cabinet.
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## **1. Executive Summary**

- 1.1 In tackling climate change, North Ayrshire Council has made excellent progress in cutting carbon emissions. In the last five years alone, emissions have reduced by over 28% within the Council's estate following implementation of a wide range of carbon reduction projects.
- 1.2 In 2019 the Council declared a Climate Emergency and announced a target date of 2030 to become carbon 'net-zero'. At its budget setting meeting in March 2020, the Council supported these aspirations by allocating an £8.8m Investment Fund to be utilised to deliver on climate change, sustainable infrastructure investment and Community Wealth Building.
- 1.3 As part of the Council's ongoing journey towards 'net-zero' a number of projects continue to be investigated including the possible use of Council owned land to generate renewable energy. Business cases for the potential installation of solar PV farms at two former landfill sites (Nethermains and Shewalton) were previously carried out which at the time were deemed to be non viable due to the removal of government subsidies, specifically the Feed-In Tariff (FIT) scheme. Reductions in the market value of solar panel infrastructure and associated costs since the original work was carried out in 2015 have created an opportunity for the proposals to be revisited and updated with current market values.
- 1.4 The updated findings indicate both proposed solar PV farm installations are now viable, with the Nethermains site emerging as the most appropriate to progress at this time due to size, energy generation potential, the availability of a more readily accessible grid connection opportunity at Ravenspark substation and the anticipated financial return on investment.
- 1.5 The proposed solar PV farm at Nethermains will:
  - provide a substantial amount of clean, renewable energy to supply the local electricity grid
  - make a further positive contribution to the Council's carbon reduction and contribute to the North Ayrshire Council Climate Emergency declaration commitment to be carbon neutral by 2030
  - provide a localised economic activity and long-term productive use for the former landfill site that would be otherwise difficult to develop
  - contribute to a reduction in fuel poverty through the availability of affordable energy

## **2. Background**

- 2.1 North Ayrshire Council declared a Climate Emergency on 11 June 2019, committing to take action on climate change and has set an ambitious target to achieve net-zero carbon emissions by 2030. Officers are currently developing the third iteration of the Council's Environmental Sustainability and Climate Change Strategy to progress towards this target and achieve a sustainable environment for future generations. The Environmental Sustainability and Climate Change Strategy will be presented to a future Cabinet in Spring 2021 for consideration of approval.

- 2.2 In 2015/16 a study into opportunities for the creation of renewable energy on Council land was undertaken as part of the North Ayrshire Renewable Energy Strategy. This included outline business cases being created for two solar PV farm projects, to be sited at Nethermains and Shewalton former landfill sites. A solar PV farm is a large-scale land application of PV panels which use the sun's energy to generate electricity.
- 2.3 Due to the removal of government subsidies, specifically the Feed-In Tariff (FIT) scheme, the business cases became financially unviable and were therefore not progressed further at that time. However, reductions in the market value of solar PV infrastructure and associated costs since 2015 have created an opportunity for the proposals to be revisited and updated with current market values.
- 2.4 Taking account of the reduced costs and changing market conditions, the two outline business cases have now been refreshed by the original authors, Arcadis Consultancy Ltd. The business cases have also subsequently been analysed and peer reviewed by academics within Strathclyde University.
- 2.5 The refreshed business cases now confirm both sites are viable in the current market and that the Nethermains site is recommended as the most appropriate to progress at this time. The outline business case for Nethermains indicates a larger installation would be possible on this site, with increased energy generation potential and greater financial return on investment. In addition there is a more readily accessible grid connection at Ravenspark substation. The development risk at Nethermains is low in comparison with the potential Shewalton development in terms of available grid connection, capacity and grid infrastructure.
- 2.6 Advanced solar design software has been used to identify the size of the solar farm possible. The site at Nethermains offers a larger solar PV farm opportunity and is considered suitable for a 7.48 MWp solar PV farm installation. (Figure 1 provides a graphical output from the software).

Figure 1 – Solar farm sizing representation using HelioScope software - Nethermains



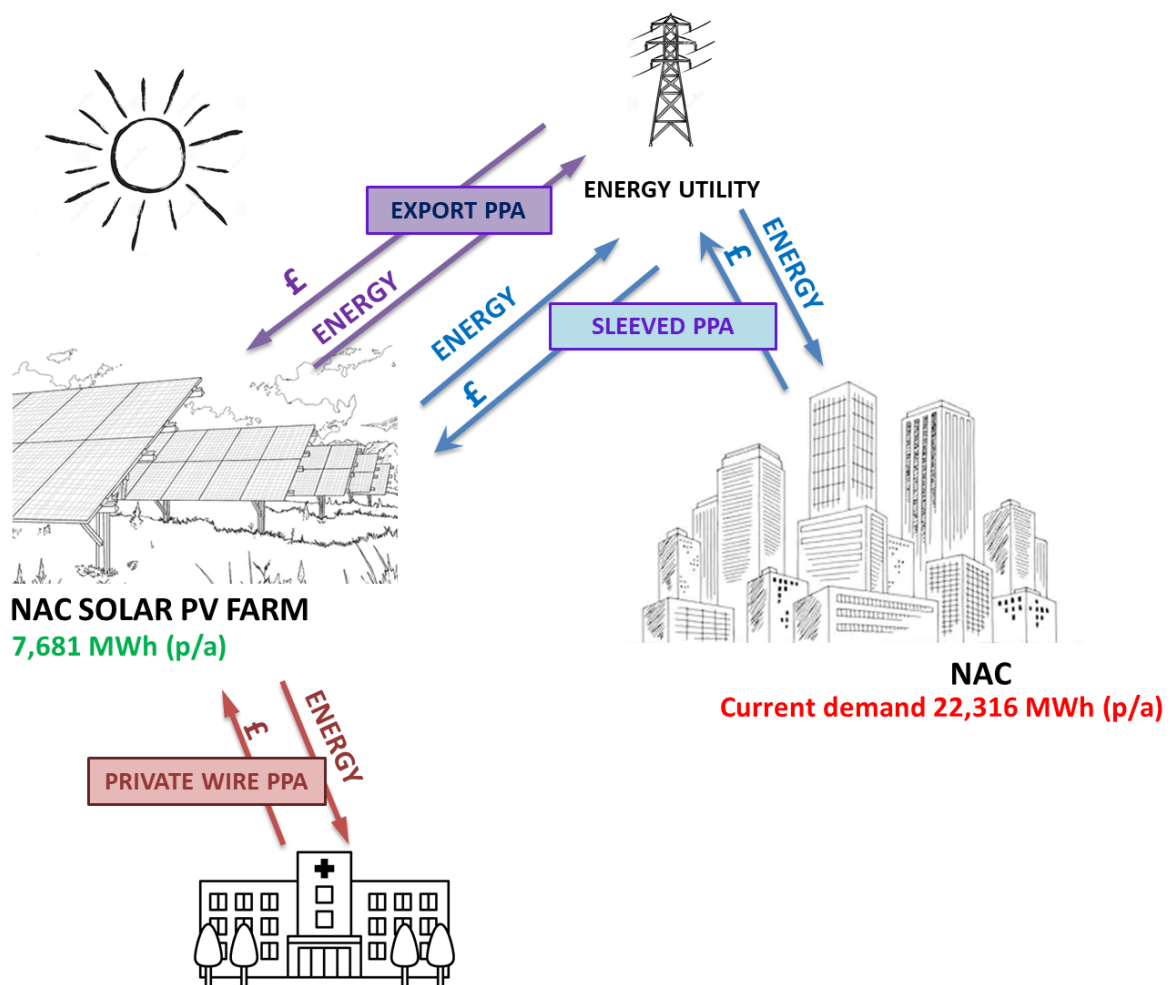
- 2.7 The installation of a solar PV farm at Nethermains provides a number of options for the use and distribution of energy created. The Council's current property estate energy requirements are around 22,316 MWh p/a. The proposed solar PV farm at Nethermains will provide 7,681MWh p/a which is approximately 34% of the Council's current energy requirements.

2.8 The energy consumption requirements of the Council are currently being reviewed in line with the recovery and renewal response to Covid-19 and our ambitious Transformation agenda. The ongoing review of current working environments and property estate will see changes to the Council's energy needs going forward.

2.9 The investigation of the potential and viability of the two solar PV farm sites has considered the following energy utilisation options:

- Developing a revenue stream to provide electricity for power at Council facilities, reducing overall annual electricity costs over the 20-year life of the asset (via Sleeveing Purchase Power Agreement) - under a sleeving arrangement, power generated by the solar PV farm would be sold back to the Council and a licensed electricity third-party supplier would manage the electricity trading activities for a fee. The advantage to the Council would be that after allowing for fees paid to the third-party supplier, the Council would be paying for power at a lower price / kWh.
- Sale of power to the electricity grid via the wholesale electricity market (via an Export Purchase Power Agreement).
- Sale of power direct via a Private Wire Purchase Power Agreement to a consumer via a direct cabled supply with transformers and switchgear.

Figure 2 – Diagram describing Potential Income sources



2.10 Indications at this stage are that the preferred option which will provide the greatest financial return is to 'sleeve' electricity for use in the Council's own estate (via a Sleeving Purchase Power Agreement). Given the volatility in energy market conditions, ongoing assessment of the most advantageous model will continue to be undertaken and will be agreed and finalised as the overall project progresses in order to maximise any market opportunities that become available. It is requested that the Council's Executive Director of Place together with the Head of Finance be authorised to progress and conclude the most appropriate Power Agreement contractual arrangements.

2.11 It is possible for the proposed solar PV farm installation to qualify for Business Rates relief under the Renewable Energy Generation Relief Scheme. To do so, arrangements would require to be in place for at least one community organisation to be entitled to:

- at least 15% of the annual profit; or
- so much of the annual profit as is attributable to at least 0.5MW of the total installed capacity of the project.

The financial modelling carried out anticipates that the rateable value of the proposed Nethermains installation will be less than £145,000 therefore 100% relief will be achieved, however this will ultimately depend on an Ayrshire Valuation Board assessment of the installed solar PV farm.

2.12 It is estimated that 15% profit from the solar PV farm will equate to approximately £2.27m being allocated to community benefit projects. Disbursement would follow the principles and mechanisms outlined in the current North Ayrshire policy on Community Benefits from Wind Turbines which was approved by Cabinet in March 2016.

2.13 To protect the solar PV installation, an anti-intruder fence and CCTV would be installed. The cost of installing a security system is included in the capital budget estimates. Maintenance costs are also considered within the financial modelling and include the following:

- Annual PV arrays/system inspections (visual and electrical check-up; cabling/wiring; earthing system; check-up / test sample of inverters and meters)
- Labour on replacement parts
- Annual (or biannual) panel cleaning
- Annual thermographic testing

Operational costs are also considered, and include:

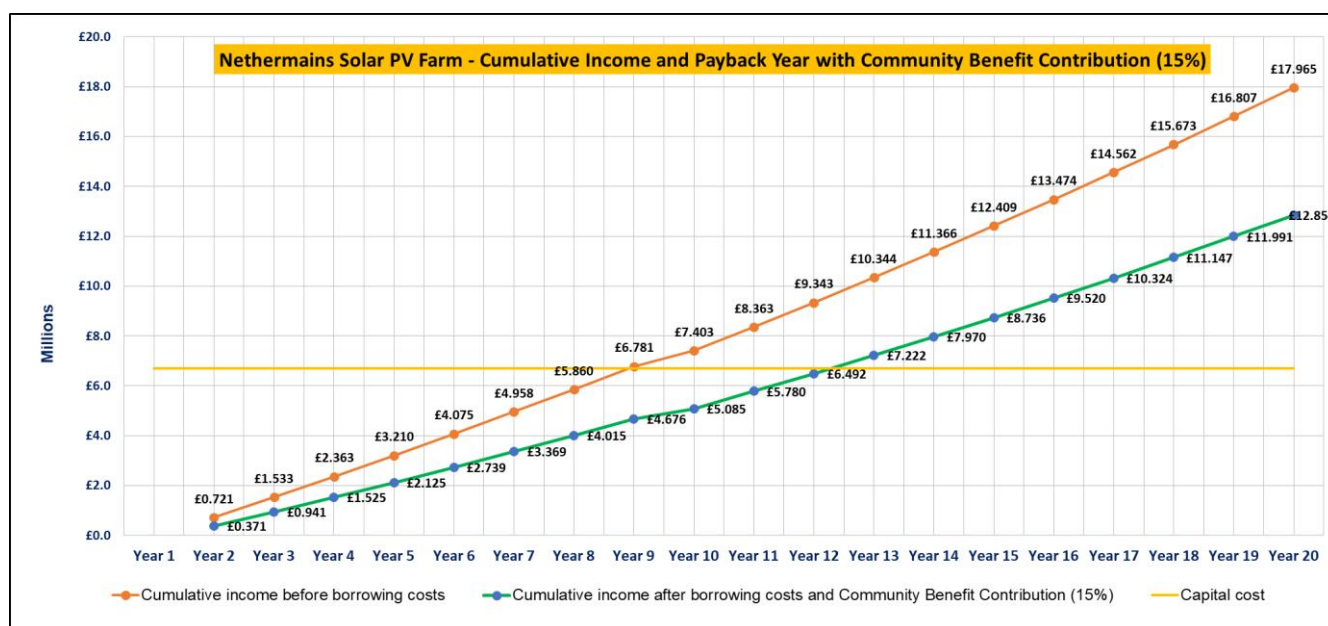
- Labour of operators for the plant and service fee
- 24/7 safety/security measures/security

2.14 Within the financial modelling it is anticipated an average annual income of £750k (after borrowing costs) would be achieved. This considers the financing of the installation being delivered by utilising £4.5m for installation and development costs from the Council's £8.8m Investment Fund with additional borrowing of £2.268m required. Availability of external funding will also be researched and sought, to reduce the

financial burden to the Council. Examples of potential funding opportunities may include Salix, Low Carbon Infrastructure Transition Programme (LCITP), Low Carbon Energy Project Capital Funding, and the Community and Renewable Energy Scheme (CARES), subject to eligibility.

- 2.15 Figure 3 below shows the estimated cumulative annual income (over a 20-year period) from investment in Nethermain's solar PV farm, comparing income before and after consideration of borrowing costs and contributing 15% of profit to community benefit projects (estimated to total £2.27million). **The total net income** from this Solar PV Farm over a 20-year period is estimated as **£12,853,886**.

Figure 3: Nethermain's Solar PV Farm – Cumulative Income and Payback Year



- 2.16 The annual reduction in CO<sub>2</sub> emissions is estimated at 501 tonnes of CO<sub>2</sub> per year based on an annual yield of 7,681 MWh.
- 2.17 The anticipated financial and carbon reduction benefits to be achieved by the proposed Nethermain's solar PV farm are summarised in figure 4 below.

Figure 4: Nethermain's Solar PV Farm – summary benefits (with sleeving arrangement)

Nethermain's Solar PV Farm (with sleeving arrangement)					
Project size	Annual Generation	Annual CO <sub>2</sub> reduction	Capital Cost	Payback (Years)	20-year Net Income (after borrowing costs and contribution to communities less £4.5m Investment Fund contribution)
7.48 MWp	7,681 MWh	501 tCO <sub>2</sub>	£6.768m	12 years	£ 12,853,886

*Note: MWp (megawatt-peak: the rate at which solar PV generates energy at peak performance)  
MWh (megawatt-hour: the total amount of electricity the system generates)*

- 2.18 For the purposes of assessing potential return on investment, it should be noted that no financial return is forecast for the first 12-18 months of the project due to the programme of works required prior to operation, i.e. site survey, planning application, grid connection application, procurement, financing and 3-6 month estimated installation requirements. The final business case on energy utilisation/distribution options will also be concluded during this time to determine the most appropriate Power Agreement and contractual arrangements.
- 2.19 Whilst at this time it is proposed to progress with the onsite installation of a solar PV farm at Nethermains, the potential to do so at the former Shewalton landfill site will also continue to be appraised in order to realise further renewable energy opportunities. Grid connection requirements will continue to be explored for Shewalton to mitigate the current risks associated with available grid connections and grid capacity.
- 2.20 A number of further opportunities will also be developed as part of the work taking place to conclude the third iteration of the Council's Environmental Sustainability and Climate Change Strategy.
- 2.21 Partnership arrangements have been established with the University of Strathclyde via Scotland's Energy Technology Partnership (ETP) within which, officers will continue to investigate creative and ambitious projects to inspire innovation in our Climate Change journey. These will include, but are not limited to:
- assessing other potential renewable energy generation opportunities such as wind power;
  - assessing other emerging energy opportunities such as hydrogen power generation;
  - the potential to utilise battery storage for power generated from the solar PV farm and other renewable sources will also be continually reviewed as new technology develops and becomes available;
  - a review of opportunities to develop further renewable energy infrastructure at the Nethermains solar PV farm to exploit the same infrastructure for financial economies will be undertaken.

### **3. Proposals**

#### **3.1 It is proposed Cabinet:**

- a. Notes the investigations into the viability of constructing ground mounted solar photovoltaic (PV) farms on Council owned land at two former landfill sites at Nethermains and Shewalton;
- b. Approves the development of a solar PV farm installation at Nethermains former landfill site;
- c. Notes the Nethermains solar PV farm proposal will require an estimated total initial investment of £6.768m which will be part funded utilising £4.5m of capital funding from the Council's approved £8.8m Investment Fund;
- d. Agrees that the remaining required funding of £2.268m will be included in the proposed refreshed Capital Investment Plan to be considered by Council in March 2021 as part of the budget setting process;
- e. Notes the options available for revenue generation from the energy created from the proposed Nethermains solar PV farm and authorises the Executive Director of Place

- together with the Head of Finance to further investigate and conclude final contractual arrangements;
- f. Notes the associated community benefits funding that the project will create for disbursement under existing policy and mechanisms;
  - g. Notes that the potential for a Shewalton solar PV farm and other renewable energy opportunities will continue to be investigated and will be reported to a future Cabinet.

#### **4. Implications/Socio-economic Duty**

##### **Financial**

- 4.1 The financial modelling provided in the report outlines details of anticipated capital costs, income and annual operation and maintenance costs, including borrowing costs, over a 20-year period. The proposed solar PV farm at Nethermain includes a capital investment of £6.768m met from £4.500m from the Council's £8.800m Investment fund with the balance of £2.268m met from borrowing. The required borrowing will be included in the proposed refreshed Capital Investment Plan to be considered by Council in March as part of the budget setting process. The total anticipated return on investment over a 20-year period is £12.854m, which represents a payback of 12 years (inclusive of borrowing costs and a 15% Community Benefit Contribution).

##### **Human Resources**

- 4.2 The successful development and delivery of the project will be met from within existing resources from a wide range of different teams within the Council, including Corporate Sustainability; Property Management and Investment; Planning Services; Corporate Procurement Unit; and Finance.

##### **Legal**

- 4.3 The procurement process will be progressed in accordance with the Council's Standing Orders Relating to Contracts and Contract Procedure Rules and Public Contracts (Scotland). The Council has power to sell electricity under the Sale of Electricity by Local Authorities (Scotland) Regulations 2010 (2010 No.1908): '2. *For the purpose of section 170A(3) of the Local Government (Scotland) Act 1973, a local authority shall be entitled to sell electricity produced from the following sources— (b)solar*'

##### **Equality/Socio-economic**

- 4.4 The proposed solar PV farm will help reduce fuel poverty and through community benefits associated with the installation, will provide funding for local communities and appropriate projects. The associated community benefits (15% community benefit contribution) will be disbursed in line with existing policy and mechanisms. The project will also serve to increase local renewables knowledge, skills and awareness within the community and will support community learning initiatives once operational.



## **Environmental and Sustainability**

4.5 The solar PV farm proposal aims to:

- make a positive contribution to national carbon reduction targets; and
- contribute to the North Ayrshire Council Climate Emergency declaration commitment to be carbon neutral by 2030
- create renewable energy on a former landfill site thereby making a positive environmental impact.

## **Key Priorities**

4.6 The solar PV farm proposal contained within the report supports the North Ayrshire Council Plan priorities:

- Active and strong communities;
- Inclusive, growing and enterprising local economy;
- Vibrant and welcoming places;
- A sustainable environment; and
- An efficient Council that maximises resources and provides value for money.

The solar PV farm proposal contributes to delivery of the North Ayrshire Environmental Sustainability & Climate Change Strategy (ESCCS) by reducing carbon emissions, increasing energy security and increasing renewable electricity generation.

## **Community Wealth Building**

4.7 The solar PV farm proposal, in addition to creating green employment opportunities, supports the following pillars of community wealth building:

- Procurement: potential for local suppliers and supply chains to benefit from the significant investment through provision of services and materials both during construction and ongoing operational phases;
- Land and Assets: explores alternative use of our land and assets that currently are not productive and re-purposes those assets;
- Financial Power: commits capital investment to support actions to reduce carbon emissions across North Ayrshire and to help achieve carbon neutrality by 2030;
- Plural Ownership: supports the Council's ambitions around municipalisation to safeguard and enhance public services for residents through innovative approaches; and allows the Council to show green economic leadership.

## **5. Consultation**

- 5.1 General consultation has taken place during the ongoing refresh of the Council's Environmental Sustainability & Climate Change Strategy (ESCCS) via Consul and an engagement event held in Saltcoats Town Hall during March 2020. Further consultation will be undertaken as the proposals develop. Significant support and engagement with Strathclyde University has assisted in the peer review of the proposal.

RUSSELL McCUTCHEON  
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### **Background Papers**

Arcadis Outline Business Cases – Nethermain's Landfill Solar PV Park and Shewalton Landfill Solar PV Park