

Agenda Item No:

Report To: Cabinet

Date of Meeting: 25th November 2021

Report Title: Solar Projects and programme

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Portfolio Holder Cllr. Nathan Iliffe
Portfolio Holder for: Corporate Property and Projects



Summary:

This report is to present and seek approval for proceeding with a significant half megawatt roof mounted solar array on industrial units at Carlton Road, Ashford at a cost of £401k including professional fees.

The solar array at Carlton Road will supply the Aspire depot with both free and carbon neutral electricity. The installation of the solar array will reduce imported electricity, and will also provide facilities to supply electricity for electric vehicles and plant.

The amount of carbon dioxide offset is estimated to be 301,322 kg per year; a significant sum which will not only offset the Council's footprint, but also help to deliver the Council's zero carbon ambitions.

Further array installations are being investigated and are varying stages of feasibility.

Key Decision: YES

Significantly Affected Wards: Victoria Ward

Recommendations: **The Cabinet is recommended to Council :-**

- I. Approve the contents of the report
- II. Authorise spending of £401,000 to design and build a solar installation at the Carlton Road industrial park
- III. Note further renewable schemes are at feasibility stage.

Policy Overview: In May 2021 Cabinet reaffirmed the pledge made in 2019 to achieve zero carbon in the council's own estate and operations by 2030.

The proposed scheme contributes significantly to achieving objective GP1: Reduce reliance on fossil fuels in line with our carbon neutral targets, in the draft Corporate Plan (under the

theme Green Pioneer) and the associated actions:
Action GP1.2: Increase renewable energy generation and use in our own estate and enable and encourage local people and communities to do the same.

Similarly, the proposed scheme directly contributes to Priority 3 of the draft Carbon Neutral Action Plan: Reduce reliance on fossil fuels for energy generation by increasing renewable energy generation and consumption. Whereby the actions under Objective 3.2 Increase local renewable energy generation.

Financial Implications:	The capital cost is estimated and will be paid back through the saving of electricity in approximately 7-8 years.
Legal Implications:	Where units have been sold, agreements need will need to be in place to allow continued use and maintenance of solar arrays.
Equalities Impact Assessment:	The assessment is not required. No adverse impacts.
Data Protection Impact Assessment:	No personal data needs to be collected or retained for the purpose of the project.
Risk Assessment (Risk Appetite Statement):	Viability has been calculated on a lower end income scenario whereby the Aspire depot consumes the energy generated and remaining energy is sold to the National Grid for a basic import rate.
Sustainability Implications:	Green Pioneer objective 1 of the draft Corporate Plan.
Other Material Implications:	Connection to the National Grid is based upon the capacity of the local infrastructure. The amount of energy generated may be affected by a curtailment factor determined by the District Network Operator.
Exempt from Publication:	No.
Background Papers:	
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Appendix 1 Plan

Appendix 2 Financial Table

Report Title:

Introduction and Background

1. In May 2021, Cabinet reaffirmed the pledge made in 2019 to achieve zero carbon in the council's own estate and operations by 2030. To take measures to reduce reliance on fossil fuels by increasing the renewable energy generated and consumed.
2. Decarbonisation to slow, stop and reverse climate change is vital for the World, Britain and for our Borough. This project forms part of the Green Pioneer objectives contained within the Corporate Plan.
3. Ashford Borough Council already has 114 photovoltaic systems in operation, on domestic properties within the Housing Service and within the Corporate Property and Projects portfolio.
4. The Council's experience of renewables had its genesis with the Housing Service's Affordable Homes Programme, when it was subject to the 'Code for Sustainable Homes'. This involved the installation of photovoltaic panels and other methods of using free energy. The initial installations gave officers knowledge about the systems and the benefits to both a property owner/landlord and occupant.
5. The initial solar arrays installed were part-funded by 'Feed-in Tariff' grants and they did help us to explore and better understand specifications and performance. The purpose of the grants was to help ignite the industry and to realise an increase in performance of the panels; which has happened. With the removal of the grant funding, the payback of the capital expenditure of installation as a property owner, (an occupant can achieve a quicker payback), is between 7 and 8 years. Most business models have historically been taken over a 20 year period, which matched the Feed in Tariff grants energy contracts and now tend to show payback 2.5 times over the 20 year period.
6. All council-owned assets will continue to be assessed for potential to support solar (photovoltaic or PV) panels, which will be installed where financially viable. This report proposes that the Council makes immediate progress with a rooftop solar installation at Carlton Road.

Proposal

7. This proposal is for a roof-mounted system on the Council's industrial estate at Carlton Road. This type of system is relatively straightforward and is applied directly to the roof structure. A system of 28 PV arrays (Appendix 1), including a total of 1381 panels, will provide a total output of 566kWp estimated peak annual production of electricity.

8. Photovoltaic array is an established form of energy collection, using the sun's energy to generate electricity without the burning of fossil fuels. The conversion of this free energy to electricity can be used to help reduce the importation of electricity into the Council's portfolio, or offset the use of imported electricity used.
9. The estimated cost of this system's installation will be £401k including construction and fees. The financial summary in Appendix 2 portrays income from a private wire scenario and the worst case scenario where a proportion of generated energy is exported at the basic rate. The financial modelling is over a 25 year period, at that point the plant will still perform but there will be an opportunity to replace or improve the system.
10. The Carlton Road site can accommodate a half megawatt system. When compared to the Civic Centre, these arrays will generate 500 Kwh electricity per annum. Carbon dioxide offset is estimated to be 301,322 kg per year; a significant sum which not only offsets the Council's footprint but reduces the amount of electricity to be imported from the grid.
11. There are several options for the use of the carbon free electricity produced:
 - a. Export electricity to the grid. The compensation for exporting electricity to the grid is low and does not provide a viable option at 4p per unit. This may change as energy prices rise but it is hard to see this option becoming more attractive.
 - b. Use a sleeving agreement to sell the green energy to an energy company. Sleeving agreements appeared to be an attractive option, in anticipation that carbon-free electricity would be attractive for energy companies to sell on to customers as an ethical product. Despite us now seeing a change in the market, the exchange rate is not significantly greater than selling to the grid; however this does need to be monitored.
 - c. Use the electricity on site or sell to adjacent user/s. The units at Carlton Road are in the majority owned by the Council. The first two sold may need to be excluded from the project but, if more are sold, they will have reservations to allow for PV arrays. Selling electricity to the units is possible but the types of companies, (i.e. storage and small commercial) occupying the units are not high consumers of electricity. Adjacent to Carlton Road is the Aspire depot; which consumes a larger proportion if batteries and vehicle charging points are considered. Supplying one consumer simplifies the plant required and is the preferred system.

Risks

12. This roof-mounted system will be specified and installed within permitted development criteria, thus negating the need for Planning permission. This reduces the timeframe for delivery. There is a marginal reduction in efficiency due to the angle of the array.

13. There is a need to apply to the Distribution Network Operator (DNO), with a possibility that the infrastructure is not robust enough or capacity in the local system has been reached and production could be curtailed.
14. Further consideration will need to be given to energy storage and the baseline consumption of the building using the power. This is to maximise the income and offsetting of imported energy consumption.
15. Material and product shortages, which are affecting procurement. A Lesson learnt when the 'Feed in tariffs' significantly changed, was that the hardware was ordered and bought in advance or when available.
16. Material, labour and product prices increasing significantly due to shortages or cost of production rising globally. Depending on the significance of the price increases, the business model is referenced to ensure viability.
17. Two industrial units already sold do not have agreements, which allow for the installation of PV panels. The tenants on these 2 units may not want solar arrays on their roofs.
18. Possible objections due to concerns about light reflected from the panels. This historically has been a complaint about larger systems. This risk should be low considering the setting is an industrial estate, on industrial buildings and at a time where reducing carbon footprints is high on the agenda.
19. Currently Low Carbon Exchange monitors our systems and this has been a hugely successful arrangement. The arrangement will now need to be reviewed periodically due to the in-house electricians' service which we have access to and which has the skills to maintain and install solar arrays; subject to re-joining the microgeneration certification scheme (MCS) and being adequately resourced.

Equalities Impact Assessment

20. Members are referred to the attached Assessment.

Consultation Planned or Undertaken

21. The Carlton Road proposal has been designed to satisfy the requirements specified by permitted development and therefore the system will not require planning permission. Consultation is not anticipated.

Other Options Considered

22. Other sites have been considered, but have fallen away due to issues accessing the National Grid, curtailment by the DNO or being financially unviable.
23. Other sites are being drawn together for a continuing programme. Some sites considered have more challenges:
 - a. Stour Centre car park – Council property which, in order to deliver a system on, requires design work and a planning application.

- b. Ellingham industrial estate – Council property which in part will involve structural considerations and planned maintenance prior to delivery.

Reasons for Supporting Option Recommended

24. The income realised from the installation. This option enables the fastest payback of the capital cost of the system and then reduces the energy costs of the property the system is supplying.
25. Carbon reduction of the Council's portfolio. The system is of a size to save significant amounts of carbon per annum for the life of the system.

Next Steps in Process

26. Start the procurement process of the photovoltaic system for the units at Carlton Road.
27. Manage the construction contract and work with construction professionals to deliver the optimal solar array.

Conclusion

28. Delivering the photovoltaic system at Carlton road, enables the Council to realise Green Pioneer objective 1 of the Corporate Plan: Reduce reliance on fossil fuels in line with our carbon neutral targets.
29. The photovoltaic system will pay back the capital cost of the system and continue to reduce running costs of Council owned property.

Portfolio Holder's Views

30. In 2019 Cabinet made a pledge to achieve zero carbon across the Council's estate and operations by 2030, this pledge was re-affirmed in May 2021. The proposed scheme outlined in this report will progress the Council to achieving this pledge. Decarbonisation efforts to slow, stop and reverse climate change is vital for present and future generations of Ashford, the Country and indeed the World. The installation of solar array at Carlton Road will reduce our reliance on imported electricity, at a time electricity prices are increasing, will provide the Aspire Depot with clean, carbon neutral electricity and will not only off-set the Council's carbon footprint, but also help deliver the organisation's zero carbon emissions. This proposed scheme contributes significantly to achieving our objective of Green Pioneer, as outlined in the Draft Corporate Plan.
31. It is my hope that continued and increased renewable energy generation at Council owned property, will encourage local residents and businesses to do the same. This is yet another example of Ashford Borough Council not just talking the talk, but walking the walk. I commend this report to Cabinet and the three recommendations outlined in the document.

Contact and Email

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Appendix 1



Figure 1: Proposed Plan of solar arrays on the Carlton Road development

Appendix 2

Table 1 below shows a summary derived from inputs in an excel workbook to calculate and demonstrate project viability. Inputs required can be characterised into:

- A) Performance statistics
- B) Design costs including consultants
- C) Construction costs
- D) In use costs
- E) Cost of finance
- F) Offsetting energy costs
- G) Income

This summary shows viability over a 25 year period. Income is dependent on who receives the electricity and how much is charged or received for each Kwh produced by the solar arrays.

The best scenario is if all the electricity is consumed by the council. The cost of imported electricity is greater than any rate achieved in a sleeving agreement. This financial summary will show income as an energy saving. With the expected increase in electricity demand at the Aspire depot when vehicles and equipment are powered by electricity, the benefit from the fossil-free electricity will get closer to the maximum £98k shown below.

Owner of Solar Photovoltaic Power Plant		
Name	566KWp Roof Mounted Project	
Export type	Private Wire	
Address	Carlton Road	

Capital Structure		
Costs	£	378,280.00
Development costs	£	22,640.00
Total Costs	£	400,920.00

Project Summary		
Business Model:	Export Electricity	
Type of Installation	Roof Mounted	
Average Plant Size	566.00	kWh
Electricity Generated	577,150.20	kWh/p.a
Irradiation Per kWp	1030	kWh/kWp
Radiation Database	Classic PVGIS	

Leveraging Options		
Equity (Investment)	0%	£ 0.40
Debt	100%	£ 400,919.60
Nominal Debt Interest Rate		£ 0.03

Revenue Streams		
None	0	£/kWh
PPA	0	£/kWh

Financials			
		1st 12 months	25 Years Total
Electricity Generated	kWhrs	577,150.20	13,756,954.37
Incentive	£	-	£ -
PPA	£	-	£ -
Offset Electricity Saving/Private wire benefit	£	98,115.53	£ 4,682,769.79
Insurance	£	1,698.00	£ 55,087.45
(CBT) Per MW	£	-	£ -
Gross Income	£	98,115.53	£ 4,677,497.69

Table 1: Financial summary for private wire scenario

Table 2 uses the same process and workbook, but this tests viability with the current electricity use of the depot and income at the most basic rate for the remaining electricity produced. The most basic rate is the current export rate to the grid; this is shown as an income of almost £29k per year.

Owner of Solar Photovoltaic Power Plant	
Name	566KWp Roof Mounted Project
Export type	Grid connection
Address	Carlton Road

Project Summary	
Business Model:	Export Electricity
Type of Installation	Roof Mounted
Average Plant Size	566.00 kWh
Electricity Generated	577,150.20 kWh/p.a
Irradiation Per kWp	1030 kWh/kWp
Radiation Database	Classic PVGIS

Revenue Streams		
None	0	£/kWh
PPA	0.05	£/kWh

Capital Structure		
Costs	£	417,900.00
Development costs	£	22,640.00
Total Costs	£	440,540.00
Leveraging Options		
Equity (Investment)	0%	£ 0.44
Debt	100%	£ 440,539.56
Nominal Debt Interest Rate		£ 0.03

Financials			
		1st 12 months	25 Years Total
Electricity Generated	kWhrs	577,150.20	13,756,954.37
Incentive		£ -	£ -
PPA		£ 28,857.51	£ 1,300,154.49
Offset Electricity Saving/Private wire benefit		£ 30,473.53	£ 1,454,413.20
Insurance		£ 1,698.00	£ 55,087.45
(CBT) Per MW		£ -	£ -
Gross Income		£ 59,331.04	£ 2,748,774.60

Table 2: Financial summary for supplying Aspire depot and export to grid scenario