



Cabinet

Item
8(i)

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Report of	Assistant Director Place & Client	Author	Andrew Tyrrell (CBC) Michael Woods (CAEL) 282390
Title	Creation of a Northern Gateway Solar Park and Micro Grid		
Wards affected	Highwoods, Colchester Rural North, MileEnd		

1. Executive Summary

- 1.1 The Colchester Northern Gateway (CNG) is an important development area for Colchester providing much needed housing, leisure, health services and employment. Although the Council and its company, Colchester Amphora Energy Limited, are already installing a ground-breaking renewable Heat Network using geothermal energy, there is also significant intensification in electrical demand which will increase due to decarbonisation and Electric Vehicle (EV) growth.
- 1.2 Recent, and further, development across the wider northern Colchester urban area has taken up most of the remaining National Grid capacity in the area. Therefore, the Council has an opportunity to provide additional green energy at CNG that will help meet its own strategic priorities in terms of role modelling, climate emergency response, and low carbon growth, helping the continuing growth, ahead of the significant reinforcement to the limited remaining Grid supply required by 2033 to meet ongoing demand.
- 1.3 The creation of a renewable energy Micro Grid, powered by a Solar Park, would assist with Grid capacity issues in the shorter term, reducing the urgency for Grid network upgrades (which are outside the Council's control), and also benefit the Council's own developments for future residents and businesses. A Micro Grid also provides great environmental and social value by improving the sustainability of the area through the creation of "clean" local electricity generation, storage (Solar PV and batteries), and distribution, all of which is also a commercial opportunity.

2. Recommended Decision

- 2.1 To consider the work undertaken to date on the development of a Solar Park and Micro Grid and agree that the further development of the "CNG Energy System Business Model" (as described in the confidential "base case"), should be continued using funding of £450K allocated for this project in the 2022/23 Capital Budget.
- 2.2 To agree that the Council (using its company Colchester Amphora Energy Limited) should continue to progress a feasible scheme through concept design and onto achieving a planning permission (RIBA Stage 3) for the development.

3. Reason for Recommended Decision

- 3.1 The creation of a new Solar Park and Micro Grid at the Northern Gateway would be another flagship, role modelling, renewable energy development led by the Council and its company, Colchester Amphora Energy Limited. It would directly deliver key strategic priorities of the Council in its Climate Emergency Declaration and allow the urban growth area to be delivered with clean, green, energy supply to provide low carbon homes and businesses; supplementing the electricity supply of the (geothermal) Northern Gateway Heat Network.
- 3.2 Aside from the clear social value and environmental benefits of this scheme, there is also good evidence through the work undertaken to date that demonstrates the proposal will also provide positive financial benefits to the Council in the medium to long-term, whilst supporting wider economic growth.
- 3.3 Investment into the energy sector can remove financial risk in the cost of energy to CNG and provide financial returns to the Council. With the current unprecedented increases in energy costs, this is particularly pertinent and will offer certainties to the Council, which will later benefit the immediate users of the energy at the Northern Gateway (both businesses and residents), as well as (more generally) to the wider Borough. The Micro Grid would also help ensure development of the CNG is not restricted by any lack of Grid capacity.

4. Alternative Options

- 4.1 Do nothing; but this will not increase the capacity of the Grid to meet future demands for growth in the area and will lose the business opportunity in addition to creating more risk to the rate of development at CNG.
- 4.2 Reduce the development, or investment in the feasibility work; which will reduce the overall costs, but also reduces the potential financial returns achievable and subsequent social and environmental benefits.
- 4.3 Develop the project in another location; but this would reduce the direct and cumulative benefits in conjunction with the Northern Gateway, and when the Council owns nearby land to directly deliver a project within an area where there are known medium to longer-term Grid capacity issues.

5. Background Information

Introduction

- 5.1 The wider Northern Gateway vision includes developing a growth area for Colchester which is a flagship Urban extension of Colchester promoting healthier living, access to sport and leisure, sustainable modes of travel and use of low carbon energy. The vision for this Council-led development was to demonstrate higher quality development, with better living, for the benefit of all future residents, businesses, and visitors.
- 5.2 To deliver on the low-carbon energy element, the Heat Network was proposed, using heat from deep boreholes into the Chalk Aquifer, to provide renewable heat to the "Mill Road" development. The Heat Network draws geothermal / renewable heat which is intensified using an industrial heat pump that is powered by electricity. The Micro Grid, which would produce electricity from Solar PV, would therefore provide renewable electricity to the Heat Network and wider Northern Gateway, as an extension of this vision, to deliver even more sustainable heat and energy.
- 5.3 Contextually, the national energy transition towards Net Zero by 2050 will have significant impacts on energy systems and economies at a national and local level. Increasingly, decentralised local action is needed; and Government thinking is enabling decarbonisation and green growth through policies that incentivise renewable electricity and remove fossil fuels, and local energy plans / systems are seen as an important aspect of managing the growth of electrical energy demand.
- 5.4 At a local level it is important to take action to realise decarbonisation and its associated economic benefits sooner, while keeping costs as low as possible for residents and businesses. The Northern Gateway development offers an opportunity for a Council-led local energy system and business to be developed to serve the key growth area.

What is the Project?

- 5.5 The carbon reduction, social benefit and business opportunity is for the development of a Micro Grid, with solar PV, and potential energy storage, electric vehicle charging infrastructure, and also the supply of electricity to CNG customers.
- 5.6 In terms of the "Ground Mount Solar Photovoltaics (PV)" element, this would create a 4.5MW Solar Park. This would be on a site that has been identified within the CNG area and would use technologies that will be more familiar to many people. Solar PV panels would capture renewable daylight energy and the DC electricity generated is converted into AC electricity using inverters. AC electricity can then be transferred using grid connections and distributed to the nearby development sites.
- 5.7 Solar PV is now viable without subsidy and a site identified would be particularly beneficial as it is near Severals Primary Substation (so the grid connection cost will be relatively low). In addition, sites where PV is installed can usually be combined with other rural land uses, such as grazing land, or habitat creation for biodiversity net gains.
- 5.8 The "Micro Grid" element is essentially a small version of the better-known national grid, whereby a smaller electricity network is created for specific users with a local source of supply (in this case, solar). As is proposed, the Microgrid is usually attached to the larger national grid but is able to function independently to provide a proposed structure that would be similar to the Heat Network, where there is a concession agreement which all

the plot developers are required to sign up to a single operator who manages the infrastructure.

- 5.9 In addition to these, the battery storage element is something that has seen rapid growth and a current booming market in electrical energy storage (mainly lithium batteries). Simplistically, this element allows energy to be stored to better match variations in demand, balancing peak and off-peak use.
- 5.10 Land has been identified for these proposals on Council owned assets at the Northern gateway, adjacent to Severalls Land and the A12. If the scheme can be developed further, ultimately to a point where it is granted planning permission, by 2030 the CNG “energy system development” could supply renewable heat and electricity with a high degree of independence from external energy sources.

Feasibility Work and Next Steps

- 5.11 This local approach has the potential to realise both environmental and economic benefits. It has the potential for reducing costs to customers and gaining additional revenues for the Council. Feasibility and business case development work has taken place on this over the last 18 months; which has led to this report, outlining the deliverable and defined opportunity, and a recommendation to continue through the further work stages required to take the project through planning application processes and onto a final delivery decision.
- 5.12 Specifically, the next steps for approval herein would be committing to obtaining planning consent and grid connections for the project to be able to tender the business opportunities in the most advantageous way, and therefore be able engage best commercial and engineering expertise, and also value the financial opportunity. These would be progressed using funding previously allocated provisionally to this project in the agreed budget for 2022/23. Tendering the opportunity would help identify the best business models and partnerships to take this complex project to final delivery.
- 5.13 A Cabinet decision would be sought regarding the final business case and CBC investment decisions, such as how the Council wishes to structure the financial, construction delivery, and subsequent operational stages.
- 5.14 In parallel, with the work on planning consent, soft market testing will take place to understand appetite for investment and partnership working structures that would de-risk the implementation stages. In the stage 2 feasibility work was done to assess the potential income from this infrastructure when fully built out to the estimated plan, but it is difficult to assess what returns could actually be obtained from a commercial operator if a different model is used until it is tested in the market, especially with the current uncertainty. Therefore more work needs to be carried out to test this further and a decision to commit further investment and decide how to structure business models into the implementation stage do not need to be taken yet. However, soft market testing rather than a tender has its limitations as many of those in this space are extremely busy in the current climate and will not engage until a definite and defined opportunity is presented.

6. Equality, Diversity and Human Rights implications

6.1 Under the Equality Act 2010, Section 149, a public authority must, in the exercise of its functions, have due regard to the need to:

- eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under this Act.
- advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and
- foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

6.2 The recommendations proposed in this paper will have no disproportionate impact on any protected group.

7. Strategic Plan References

7.1 The Strategic Plan 2020-23 identifies the following Strategic Plan goals:

- Respond to the Climate Emergency: Environment and sustainability embedded within all Council decision making
- Create new communities and adopt a new Local Plan that delivers jobs, homes, and the infrastructure to meet the borough's future needs
- Develop the Colchester Northern Gateway as a sustainable place to live, work and play.

8. Consultation

8.1 Development at Northern Gateway has been subject to past consultation and each development within the Northern Gateway is subject to consultation at various stages, including the planning application and highway notices stages. When development plans are crystallised, appropriate consultation with stakeholders will take place and the intended planning application would include statutory consultation by the Council in its role as the Local Planning Authority.

9. Publicity Considerations

9.1 The Northern Gateway is long documented and publicised as this project will be an incremental part of creating a more sustainable development and will be publicised when appropriate in the progression of the development, i.e. when planning consents as being co-ordinated.

9.2 The Council would want to publicise this positive project. The project is also likely to generate interest, as the Heat Network has, from academics, industry professionals, sector organisations and the wider media, public interest.

10. Financial implications

10.1 The financial implications are set out in the main report and restricted, at this time, solely to the commitment of £450K in order to develop the scheme and seek a planning permission. The development funding would be from the £5.7 million allocated for this project in the capital programme.

- 10.2 Beyond obtaining planning permissions, the current energy crisis shows the volatility of the energy markets over the lifetime of the types of projects proposed. This creates inevitable risks to the predictability of such projects, but the actual returns that will be realised are more likely to be of positive impact, rather than negative, over the lifespan. This will need management, as with any ongoing business, in due course; however final business case decisions on the investment and structure of any construction would be taken at a later date once a planning approval has been secured.
- 10.3 Similarly, the subsequent decisions (to be sought post-planning approval) as to how the project is implemented and structured, will set out more detailed financial implications for the subsequent stages.

11. Risk Management

- 11.1 The concept and development of the project has been carried out by Colchester Amphora Energy and it has been through two stages of feasibility work carried out by UK Power Network Service Ltd, with the support of the Greater South East Energy Hub who provided grant funding. This funded work has helped show the basic technical and financial feasibility and provided an outline design that de-risks the early uncertainty on such ideas.
- 11.2 Additional support for the subsequent development of the business plan has been obtained from Riverswan Ltd, who have a long track record of proven experience in the regulatory and business side of energy utilities, with discussions with the District Network Operator on Grid connections and some initial soft market testing to understand what would be the most attractive to investors. The use of their expertise has given further objective advice and scrutiny in preparation for taking this decision to proceed to planning phases.
- 11.3 Also, a planning pre-application enquiry was submitted for a solar PV farm and the response did not identify any insurmountable barriers; other than usual planning requirements for this type of installation. These include consideration of landscape character, biodiversity, etc, none of which cannot be resolved in the preparation of the application submission documents so that an acceptable proposal should be submitted to the Planning Service in due course (i.e. there was no significant objections to the principle). Advice at planning enquiry stage is non-prejudicial, but offers good early feedback to ensure confidence that any issues raised can be addressed.
- 11.4 The result of this risk management work is the plan for next stage of development to obtain planning consent and grid connection for the solar PV and battery storage with the aim to have them in place by spring 2023, when a decision on the preferred business model will be made. At that time it is expected that the impacts of the current energy price crisis and likely future of energy markets will be more clear, therefore allowing better assessment, management and mitigation of risks, when the main development risk of planning consent and grid connection has been removed, leaving the primary risk of the operating model
- 11.5 By tendering the business opportunity, to own/operate the assets, after later decisions (with more certainty) will provide strong and important feedback from potential investors with expertise in the area on the best way for the Council to capitalise on the opportunity. This might be sale of the opportunity, Joint venture, self-investment or combination of

those options so that the Council can take a measurable and understandable position on any risk it might want to take in developing the project. However, this decision can also be taken at a later date once that certainty has been further secured. This decision is not being taken now.

- 11.6 Investment in energy projects similar to what is being proposed has been, and is being, carried out by Councils across the UK for similar reasons and is being actively encourage by government. See netzero.org.uk which Government have recently funded to assist Councils with little available expertise to develop renewable projects.
- 11.7 Commercial arrangements for local energy businesses can be complex and some operating models can carry significant commercial risk. Therefore, on deciding final operating model it will be important ensure that potential risks are well understood and mitigated before proceeding to a major investment / the implementation stage. The current plan will development business proposition further which will more accurately identify and remove risk. The combination of planning approval with grid connection will provide a financial value of its own so that the investment in the work to obtaining them should be recoverable with a profit if sold on to a developer.
- 11.8 With regard to wider risk beyond the scope of this specific report/project, the recommendations in this report will also help to mitigate the risks facing the Council in the development of the CNG as a whole, and projected national energy costs. The volatility of the energy market highlighted in 10.2 above is also a risk management implication.

12. Environmental and Sustainability Implications

- 12.1 This project will deliver significant environmental benefits and be a leading example to role model and influence others. The project will produce lower carbon electricity at affordable prices to those in the development area, while providing a long-term return on investment for the Council and local employment in the energy sector.
- 12.2 Much could be written about the positives of this project, but in essence the generation of solar power is a “clean” energy source that avoids the use of fossil fuels or other higher carbon producing sources of fuel. Solar farms are often said to be the most direct way to reduce carbon emissions that contribute to global warming. With the inclusion of a microgrid, the renewable energy produced by the solar panels can be fed to adjacent development or the surplus power could be fed into the mains grid; in either case thereby distributing clean energy.
- 12.3 In addition, it is usually possible to create habitat or biodiversity net gain combinations on the site of solar PV. Panels are often low maintenance and therefore the creation of added value for biodiversity can often complement the energy production and allow for other environmental benefits. This proposal is likely to create additional tree and hedgerow planting to integrate within the landscape character and this will also add to the already significant environmental benefits.

Appendices

(Not for Publication) Appendix A: “CNG Energy System Paper v1.1