Nottinghamshire County Council

Report to Policy Committee

17 March 2021

Agenda Item: 7

REPORT OF THE LEADER OF THE COUNCIL

A ZERO CARBON ENERGY FUTURE FOR THE UK: POTENTIAL SITES IN NOTTINGHAMSHIRE FOR ENERGY PRODUCTION

Purpose of the Report

1. To seek Policy Committee approval to work in collaboration with landowners and other relevant stakeholders and for the Council to act as the body to nominate Nottinghamshire sites for consideration by the United Kingdom Atomic Energy Authority (UKAEA) for 'Spherical Tokamak for Energy Production (STEP).

Information

2. STEP is an ambitious Government led programme to design and construct a prototype fusion power plant. STEP was recently announced as part of the Government's Ten Point Plan for a Green Industrial Revolution and the UK's ambition to be the first country in the world to commercialise fusion energy technology. The project will be at the international forefront of the clean energy revolution, bringing visibility on a global stage.

3. The programme is being led by the United Kingdom Atomic Energy Authority (UKAEA) an executive non-departmental public body sponsored by the Department for Business, Energy & Industrial Strategy (BEIS). UKAEA has initiated a nationwide process to identify potential sites for STEP by approaching local authorities seeking initial nominations of suitable sites by 31 March 2021. It is understood that the current landowners of relevant sites would not be directly involved in the detailed development of STEP, with the expectation being that the necessary area for the development is acquired by UKAEA. The subsequent phase of STEP is to produce a concept design by 2024. As the programme moves into the detailed engineering design and build phases of the programme the UKAEA will work with a range of partners to deliver the prototype of a commercially viable fusion plant. Fusion power provides scope for limitless low-carbon energy.

4. To sustain economic growth, sources of energy that are emission-free, safe, globally available and economically viable, need to be developed. Fusion power is an attempt to replicate the processes of the Sun on Earth. It differs significantly from nuclear fission, which has been the only way of getting electricity from atoms since the 1950s. The fusion process is inherently safe and has the unique capability to provide utility-scale energy on-demand, wherever it is needed. This makes it an excellent complement for intermittent renewables such as solar power and wind generated energy and battery storage. Combined, these technologies make for a practical energy portfolio that mitigates climate change while driving economic prosperity.

5. STEP will have many of the features of a fully operational power station, including infrastructure and associated research and development facilities. It is likely to be a

delivery project of comparable scale and value to a major operational power station. The programme is expected to be consented as a Nationally Significant Infrastructure Project (NSIP) under a Development Consent Order (DCO). Development Consent Orders are required for designated Nationally Significant Infrastructure Projects and are determined by Central Government rather than other consents such as planning permission which is determined by the relevant local planning authority.

6. There are also a range of other environmentally beneficial ways fusion heat could be used including hydrogen production, desalination, district heating and more. It's possible that UKAEA may choose to develop these technologies on site too. These buildings are not expected to differ greatly in scale and appearance from the fusion plant and turbine facilities.

7. The programme will be reliant on significant skills for development and operations. This will range from apprentices, through degree and graduate skills, and experienced career professionals. The STEP programme will need people with a wide range of skills, from science and engineering to construction and catering in different phases of the programme. UKAEA has already allocated resources to support an apprentice training scheme and will work with local education and training providers at the earliest opportunity.

8. The fusion plant itself is only useful if the low-carbon power it generates can be put to good use. The basis of design is to work towards a fusion plant which could power a turbine to produce electricity. Turbine halls from existing power stations may be able to be reused and the STEP prototype reactor would have similar requirements to any other power station.

9. For the programme to move forward, the UKAEA needs to know that the community nominating itself is able to bring the various parties and stakeholders together to work in partnership with UKAEA, and successfully enable development and construction.

10. Further information is detailed at the following website www.step.ukaea.uk

The Opportunity STEP Presents and the Proposed Role of Nottinghamshire County Council

11. UKAEA invites site nominations from almost any party. The Authority actively encourages a range of relevant bodies (e.g. Councils, Local Enterprise Partnerships (LEP), Regional Development Groups) to propose sites based on a strategic vision for the future of the community. These proposing entities could be pre-existing or formed for the specific purpose of nominating a site for STEP. UKAEA recognise that landowners may not have the time or resources to proactively propose land themselves and regard this partnership model as appropriate. Any person or entity can nominate a site. The Agency simply asks that:

    - The entity is capable (in personnel and funding) to work with UKAEA through the assessment process.
    - The entity has some form of jurisdiction (Council, LEP, business group, devolved Government) for the land included in the nomination.
    - Not more than one entity proposes the same site.
    - Consent of the landowner is secure

12. The proposing entity is expected to be the primary point of engagement for the UKAEA throughout the assessment process but need not retain a development role in the programme beyond the final selection, though UKAEA recognises that many of the bodies likely to propose a site (Councils, for example) would remain significant stakeholders and even statutory consultees in any future development.

13. Nottinghamshire County Council is well placed to nominate sites within the County due to the close links with each of the District and Borough Councils. The County Council also has a well-established stakeholder network and a good working relationship with the landowners. This will ensure that comprehensive nominations can be prepared and submitted to the UKAEA. If either of the site nominations are taken to the next stage of assessment, the County Council may input into the work undertaken by the UKAEA and the landowner in respect of the development of the site.

14. The STEP project itself will be a major advancement in delivering the Council's own policy objectives for delivering environmental improvements but also creating sustainable employment opportunities and economic growth.

15. At a Regional Level the Midlands Engine is leading the way by aligning partners to deliver a Green Recovery especially through transformational programmes such as the Energy Research Accelerator (ERA) and the Midlands Engine Development Corporation. This initiative builds on this and would innovate, enable and accelerate the Green Recovery in our Region should any of the nominated sites be taken forward. The Council has recently endorsed the next steps in the Midlands Engine Development Corporation Programme. The Council is taking a lead role in this Corporation, and, beyond the economic benefits, the programme will be designed to protect and enhance the environment, with a strong focus on reducing greenhouse gas emissions and achieving net gains in natural capital

16. The Council is a lead member of the sub-regional D2N2 Local Enterprise Partnership and supports the delivery of its D2N2 Economic Recovery and Growth Strategy - 'The Heart of the UK's Green Revolution'. A collective approach sits at the heart of this work, especially if the D2N2 area is to firmly establish its credentials for low carbon business, innovation and education. The Council is also a key partner in the Nottinghamshire and Derbyshire Local Authorities Energy Partnership, which works to alleviate fuel poverty, reduce carbon emissions, improve energy efficiency and promote sustainable energy generation.

17. In actively supporting the range of regional and sub-regional green economic growth initiatives, Policy Committee (13 January 2021) also endorsed a regional bid for a Freeport which set out the opportunities for green growth and zero carbon. Subsequently, the Chancellor announced on 3 March 2021 that the East Midlands Freeport bid was successful. Several initiatives are already in development by both LEPs and the emerging East Midlands Development Corporation, which position the Nottinghamshire site nominations well in terms of demonstrating how the Council meets this bid requirement. Manufacturing businesses are leading projects to reduce the carbon footprint of their businesses and supply chains and to future proof their operations through adopting green technologies. Replacing the coal-fired electricity capacity also provides an unprecedented opportunity to spearhead a new, ambitious zero-carbon energy zone at Ratcliffe-on-Soar that can be a showcase to the rest of the country. It has the scope to be integrated with large scale clean hydrogen generation and distribution; energy from waste; a Gigafactory for low carbon vehicles; training

facilities supporting a range of low carbon sectors; and to support the Development Corporation's vision for a flagship national research centre for Integrated Zero-Carbon Futures. The siting of the STEP project in Nottinghamshire would lead it to be a location that would truly be a world leader in green energy production.

18. The STEP project is the first but important stage in commercialising fusion energy, which in the long term is expected to generate clean energy to meet society's future need

19. Based on the increasing body of evidence and research into Fusion power, both in the UK and abroad, it is considered, by the UKAEA, that fusion has a number of benefits over traditional sources of energy generation. These benefits include:

- Zero greenhouse gas emissions and no waste products. Its only by-product is helium- an inert, non toxic gas.
- Fusion energy is inherently safe. It is difficult to reach and maintain the precise conditions for fusion – if any disturbance occurs, the plasma cools within seconds and reaction stops.
- There is enough fusion fuel to power the planet for hundreds of millions of years. The raw materials for energy production are found in sea water and the earth's crust
- Fusion can produce energy on-demand and is not affected by weather.
- Fusion power stations require less land take than other renewable technologies

Strategic Stakeholder Support for Locating STEP in Nottinghamshire

20. The UKAEA wants to understand how relevant local bodies would work in partnership with STEP to realise the successful delivery of this programme. The Authority asks the nominating body to outline how this programme would be part of increased collaboration between local, regional and devolved institutions on science, research and innovation. If either of the site nominations go forward to the next stage of assessment, UKAEA would set up the following within 12 months:

- Establish a liaison office within the community

- Establish a stakeholder and community interface forum, to meet at least quarterly.

- Outline a provisional consenting and permissioning schedule, informing the community of the intended timelines for planning consultation activities. UKAEA notes that such details are highly subject to change – but will take a "best current understanding" approach to community information sharing, as we embark on this exciting journey together.

- Establish liaison with suitable local and regional universities, to support long term development of fusion and STEM (Science, Technology, Engineering and Mathematics) expertise in the region.

21. Solid policy foundations exist at regional, sub-regional and local level, as outlined above, to support stakeholder engagement in supporting the STEP bid in Nottinghamshire. In addition, from the wider geographical area Sheffield City Region

representatives have indicated that they would support a Nottinghamshire bid as they currently do not have any sites and can see the spin-off potential especially with the Nuclear Advanced Manufacturing Research Centre (AMRC) facility in Rotherham. Furthermore, there is a link to Derby as Rolls-Royce who currently manufacture smaller nuclear units. The Nuclear AMRC's proposal to establish a new advanced manufacturing research centre in Derby also secured government funding in 2020. The decision as to whether Derby and Derbyshire plan to nominate a location themselves is unknown at the time of writing this report. Wider than this, it is known that stakeholder groups including local authorities in the South West of England and Lancaster are already well advanced with developing their bids to be the location for the STEP project. There are likely to be other locations elsewhere in the UK committed to bidding to be the home to this highly prestigious project.

22. The Nottinghamshire site nomination process has the support of the relevant district and borough councils who have taken reports through their respective cabinets for approval, the D2N2 LEP, Universities, the Midlands Engine, partners for the emerging Development Corporation and the relevant land owners. A stakeholder group has been established as asked for by the UKAEA which will further evolve the partnership opportunity presented by this unique opportunity.

What are the STEP Site Specific Requirements?

23. The final design of the STEP facility has yet to be completed, so it is not clear exactly what buildings or facilities will be needed. However, there are a number of site specific criteria that any site nomination would need to meet. These are:

- A site of at least and preferably considerably above 100 hectares
- Access to cooling water
- A site that is likely to meet planning criteria
- A strong grid connection to retain the option of putting the power generated into the system, and to ensure its inward power needs.
- To work hand in hand with local authorities, academia and business groups to deliver a programme that will provide transformational benefits.
- Communities with a clear, ambitious and achievable vision for growth related to energy and research and development and a lasting and significant boost to the host community.
- To work together with the landowner to move the programme forward.
- The STEP fusion project would not be able to proceed in an area where a Local Authority meaningfully opposes any fundamental aspect of the programme. This does not include any opposition a Local Authority may have to 'standard' nuclear fission power station development.

24. For the programme to move forward, the UKAEA also need to know that the community nominating itself can bring the various parties and stakeholders together to work in

partnership with UKAEA, and successfully enable development and construction. This is in place and evolving as referred to in paragraph 22 above.

Potential STEP Sites in Nottinghamshire

25. The UKAEA has confirmed that more than one nomination can be submitted within any geographical location. It will be the role of the UKAEA to assess all nominations on their merits.

26. Two separate site nominations for Nottinghamshire are being considered for nomination to UKAEA. Both proposals are located on existing power station sites, one at Ratcliffe on Soar in Rushcliffe and one at West Burton A in Bassetlaw. The location of the sites is shown in Appendix A of this report. The County Council is co-ordinating with the landowners to develop the relevant nominations. Subject to relevant landowner support both will be submitted to the UKAEA in the nomination process.

High-level STEP Timetable

27. The submission deadline for site nominations is 31 March 2021. From this date sites will pass through a period of evaluation by UKAEA. On conclusion of its assessment, UKAEA will make a recommendation to the Secretary of State for the Department for Business, Energy & Industrial Strategy (BEIS) with the successful site announced around the end of 2022. The recommendation will be made following a rigorous validation and assessment process based on a set of key criteria covering three main areas: technical and operational suitability; alignment with STEP's socio-economic and community benefit principles and support for the commercial progress of the project.

28. The aim for the next phase of work on STEP is to produce a 'concept design' by 2024. The following phase of work will include detailed engineering design, while all relevant permissions and consents to build the prototype are sought. The intention is to have a fully evolved design and approval to build by 2032, enabling construction to begin. The final phase is construction, with operations targeted to begin around 2040.

29. The evaluation and decision process is determined by the UKAEA and the process they have published through the "Showstoppers" stage and/or other stages of evaluation. The UKAEA would encourage credible bids from all interested and relevant parties at this first stage. Following this the UKAEA will review the bids and carry out their own site assessments over the Summer. This first part of the bid process is quite high level, demonstrating compliance with the "Showstoppers" and providing answers to the questions in the submission document. The UKAEA has confirmed that landowners could pull out during the evaluation process and that this would not harm any organisation that did so.

Other Options Considered

30. STEP will need full power station infrastructure, and as a result Nottinghamshire's coal fired Power Station sites meet the requirements set by UKAEA. The existence of this infrastructure presents an opportunity to secure the high profile project in Nottinghamshire, helping the UK to be the first country in the world to commercialise fusion. The STEP project could create thousands of highly skilled jobs to drive the Councils Green Industrial Revolution. It is for this reason, the 'do nothing' option was discounted.

Reason for Recommendations

31. Nuclear fusion generated energy is needed to radically decrease carbon emissions. The Council has an ambition to raise the profile of Nottinghamshire, doing all the authority can to create the best conditions for investment and growth. If Nottinghamshire were to be home to the UK's ground-breaking protype fusion power plant, it will pave the way to a supply of low carbon, clean energy and help support thousands of new highly-skilled jobs.

Statutory and Policy Implications

32. This report has been compiled after consideration of implications in respect of crime and disorder, data protection and information governance finance, human resources, human rights, the NHS Constitution (public health services), the public sector equality duty, safeguarding of children and adults at risk, service users, smarter working, sustainability and the environment and where such implications are material they are described below. Appropriate consultation has been undertaken and advice sought on these issues as required.

Financial Implications

33. There are short term County Council resource requirements to support the STEP site nomination submission. Given the level of technical input and the need to liaise and seek buy-in from key stakeholders and landowners there has been the requirement for a dedicated County Council project team to support site nominations by 31 March 2021. The focus on submitting a site nomination within this timeframe has identified a budget requirement of up to £50,000 including programme leadership, technical information gathering, research, public relations and associated activity. A range of these resources including officer capacity have been commissioned through Arc Partnership Limited. These costs will be met from the existing Investment and Growth Services budget for major projects. Should the site nomination process be successful the Council would use resources from the Investment and Growth Services budget to fund ongoing support. As it is still unclear what the nature of that support will be, Council officers will review the position as further information emerges, including any potential impacts, risks and issues, which will be reported back to Committee as part of an update report.

Implications for Sustainability and the Environment

34. Climate change and the degradation of natural capital assets are defining issues of our time and by recognising this concern Policy Committee adopted the Corporate Environmental Policy and approved the development of the Corporate Environment Strategy. The main aim of the Environment Strategy is to drive measurable improvements in the environment, to ensure Nottinghamshire continues to stand out as a great place to bring up a family, fulfil ambition, enjoy later life and start and grow a business.

RECOMMENDATIONS

It is recommended that Policy Committee:

1) Endorses the proposal for the Council to act as the nominating body for submission of STEP Site Nomination Forms to the UKAEA promoting sites within Nottinghamshire;
2) Subject to the written agreement of relevant landowners to be included as a Site for Nomination and working in collaboration with other relevant stakeholders, delegates authority to the Corporate Director Place, in consultation with the Leader of the Council, to approve the final content of the STEP Site Nomination forms to be submitted by 31 March 2021;
3) Agrees to receive a further report to consider any implications for the County Council, should the nominations be taken forward to the next stage for any site within Nottinghamshire by UKAEA and BEIS; and
4) Agrees to setting aside a funding requirement of up to £50,000 from the major programmes delivery work budget.

COUNCILLOR MRS KAY CUTTS MBE
Leader of the Council

For any enquiries about this report please contact: Adrian Smith, Corporate Director Place, T: 0115 977 3680

Constitutional Comments (HD 04/03/2021)

40. The issues within the report relate to matters concerning economic development and regeneration as well as environment and sustainability which straddle the responsibilities of more than one Committee. As a result, and under the Council's constitution, Policy Committee is empowered to discuss and determine decisions which fall within the remit of more than one Committee.

Financial Comments (RWK 04/03/2021)

41. The report proposes expenditure of £50,000 to support the submission of a STEP site nomination. This expenditure will be funded from the proposed allocation of £430,000 from contingency for Delivering Major Programmes of Work and Bids for Funding which is the subject of another report on the Committee's agenda.

    Should the site nominations for any site in Nottinghamshire be taken forward to the next stage by UKAEA and BEIS the financial implications will be addressed in a future report to Committee.

Background Papers and Published Documents

Except for previously published documents, which will be available elsewhere, the documents listed here will be available for inspection in accordance with Section 100D of the Local Government Act 1972.

- *Update on the Environmental Policy and Environment Strategy* 18 March 2020 https://www.nottinghamshire.gov.uk/dms/Meetings/tabid/70/ctl/ViewMeetingPublic/mid/397/Meeting/4283/Committee/515/SelectedTab/Documents/Default.aspx

- *Corporate Environment Strategy Update*, Policy Committee 9 December 2020 https://www.nottinghamshire.gov.uk/dms/Meetings/tabid/70/ctl/ViewMeetingPublic/mid/397/Meeting/5422/Committee/515/SelectedTab/Documents/Default.aspx

- D2N2 Economic Recovery and Growth Strategy 2020: https://d2n2lep.org/wp-content/uploads/2020/12/Recovery-Strategy-2020-V9_FINAL_Min.pdf

Electoral Divisions and Members Affected

- Councillor John Ogle – Tuxford division
- Councillor Reg Adair – Leake & Ruddington division
- Councillor Andrew Brown – Leake & Ruddington division