

ABERDEEN CITY COUNCIL

COMMITTEE	City Growth and Resources
DATE	3 rd February 2021
EXEMPT	No, but an exempt verbal update will be provided in the appropriate section of the agenda (paragraph numbers 8 and 10).
CONFIDENTIAL	No
REPORT TITLE	Aberdeen Hydrogen Hub Delivery Model
REPORT NUMBER	COM/21/029
DIRECTOR	N/A
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TERMS OF REFERENCE	1.1 & 3.3

1. PURPOSE OF REPORT

- 1.1 The purpose of the report is to provide an update to Committee on the proposed investment and delivery model for the Aberdeen Hydrogen Hub.

2. RECOMMENDATIONS

That the Committee:

- 2.1 Notes work carried out to date in respect of the Aberdeen Hydrogen Hub and that a Prior Information Notice (PIN) has been uploaded to Public Contract Scotland to allow interested parties to respond as part of a market testing exercise;
- 2.2 Instructs the Chief Officer – City Growth following consultation with the Chief Officer – Finance, Head of Commercial and Procurement Services and the Chief Officer – Governance to take forward discussions with external providers to establish the most viable route to deliver the Hydrogen Hub; and
- 2.3 Provides a further update once the PIN market testing is complete to Council as part of the budget setting process for options for investment.

3. BACKGROUND

- 3.1 At its meeting 28th October 2020, the City Growth and Resources Committee Members approved the Aberdeen Hydrogen Hub programme of work as part of the City's Net Zero Vision and Strategic Infrastructure Plan – Energy Transition. With hydrogen power a key strand of the overall ambition to become a 'climate positive city' a three-phase plan was approved.

- *Immediately:* Delivery of production storage and distribution infrastructure for green hydrogen utilising renewable power to service transport;
- *Medium term:* Delivery of hydrogen power for heat systems – eg housing, industrial areas; and
- *Longer term:* a large-scale UK Hydrogen Production and Export Hub in Aberdeen, capitalising on ScotWing leasing rounds for offshore wind power.

- 3.2 The Committee also noted that the Scottish Government’s Energy Transition Fund had allocated up to £15 million for delivery of the Aberdeen Hydrogen Hub – Phase One and in order to support delivery, instructed the Chief Officer – City Growth following consultation with the Chief Officer – Finance, Head of Commercial and Procurement Services and the Chief Officer – Governance to identify the optimum investment and delivery model for the production, storage and distribution of renewable hydrogen for Aberdeen, and report back to this Committee with the results of that appraisal.
- 3.3 Since this Committee decision the Scottish Government has released a Hydrogen Policy Statement ([Scottish Government Hydrogen Policy Statement \(www.gov.scot\)](http://www.gov.scot)). This acknowledged that “It is becoming increasingly clear that hydrogen will play a major role globally in the transition to net zero, and Scotland’s assets, natural, human and physical mean we can be a major player in this emerging global hydrogen market”.
- 3.4 The Statement details a vision: “for Scotland to become a leading Hydrogen nation in the production of reliable, competitive, sustainable hydrogen and secure Scotland’s future as a centre of international excellence as we establish the innovation, skills and supply chain that will underpin our energy transition”.
- 3.5 It is intended the Hydrogen Policy Statement will provide the framework for the development of a Scottish Hydrogen Action Plan in 2021 (alongside the UK Government’s planned Hydrogen Strategy) which will provide further detail on the planned approach and necessary actions to implement the Policy Statement. These policies comprise: development of the supply chain, hydrogen for heat, hydrogen for transport, hydrogen for industry, hydrogen research and innovation, and hydrogen for trade. The Aberdeen Hydrogen Hub is the first case study detailed in the Policy as its whole systems approach (for energy, heat, transport, industry applications) to hydrogen has resulted in Scottish Government Energy Transition Fund support.
- 3.6 An Aberdeen City Region Hydrogen Strategy and Action Plan (2015-25) exists but actions have been delivered and provides the framework from which new developments, including the Aberdeen Hydrogen Hub Business Case that is a key component of the Scottish Government’s new Hydrogen Policy Statement.
- 3.7 The Hub provides the foundation from which the case for further hydrogen developments and investment in the region will be made, and officers continue to engage with stakeholders and investors on the growing European export market for green hydrogen.

- 3.8 The work to date on the Aberdeen Hydrogen Hub, and the recognition in the Policy Statement of the role of the energy sector and the north east, has also indicated the need for a 'statement of intent' setting out the city region's credentials and ambition to a range of developer, funder and investor audiences. Officers have been discussing this initiative led by Scottish Enterprise in partnership with Opportunity North East (ONE), OGTC and officers from Aberdeenshire Council, that could ultimately form a 'route map' of actions going forward.

Delivery Models for the Hydrogen Hub

- 3.9 Since the Committee instruction, officers have assessed various options and criteria in consultation with ONE and Scottish Enterprise.

Commercial Key Criteria:

1. A commercially viable business model for the delivery of the initial investment and proposals for subsequent development phases.
2. A development and/ or investment opportunity for Aberdeen City Council with either benefits in kind (i.e. reduction in price of fuel for investment) or delivery by a commercial partner.
3. Willingness by partners to collaborate with other future hydrogen suppliers in the region to store and supply hydrogen for Aberdeen as part of a regional hydrogen consortium
4. Evidence to support job creation and retention of highly skilled jobs in the energy sector across North East Scotland
5. Deliver hydrogen (at the point of use) at an initial target price of £6.15 per kg (or less over different timelines with options).

Technical Key Criteria:

6. Hydrogen made using 100% renewable electricity (i.e. green hydrogen from onshore or offshore wind, solar, or tidal energy within the Aberdeen City Region).
 7. Minimum 500kg per day of hydrogen by February 2022 (to coincide with delivery of additional buses)
 8. Ability to scale renewable hydrogen production in line within the Aberdeen city region demand
 9. Hydrogen storage capability connected to renewable production in times of wind curtailment/ low wind/ lack of sun, etc to ensure continuity of supply
 10. Establishment of hydrogen distribution and refuelling network (to service minimum of two locations) in Aberdeen with potential to expand throughout North East Scotland if demand is required.
- 3.10 Various technically viable models that the Council could pursue to deliver the Hydrogen Hub ambition were then considered. These are outlined in Appendix 1: Potential Aberdeen Hydrogen Hub Delivery Models along with their potential benefits and risks.
- 3.11 A review by officers concluded that the optimum delivery model for the Hydrogen Hub would likely be a Joint Venture or consortium approach. This

relationship would then allow all parties to fully commit and contribute to an ambition for Aberdeen to become the UK's first 'Hydrogen City' by 2030. And contribute to the ambition for the city to be a national and international exemplar and destination for inward investment in energy innovation and commercialisation.

Testing the Market

- 3.12 Ultimately, given the technical and commercial scale of the Hub, any model delivered with an external provider(s) has to be tested with the market beforehand. To update this Committee on the potential interest in the Hydrogen Hub project, officers therefore released a PIN using Public Contract Scotland on 22nd December 2020 inviting interested parties to respond on potential delivery model options for the production, storage and distribution of hydrogen.
- 3.13 As an opportunity may exist for the Council to invest in the Hub and potentially achieve some level of return, the market has therefore been invited to outline their commercial and technical capability for delivering a Hydrogen Hub and the potential involvement by the Council in such a venture (for example, a facilitator, investor, developer, supplier, customer, etc).
- 3.14 Officers will then take forward the most realistic submission(s) that meet the commercial and technical criteria to further discussions to establish any opportunities and what this could entail. The deadline for proposals was 22nd January with virtual discussions taking place with interested parties until 17th February.
- 3.15 Officers will report on the outcome of discussions for consideration by the Council as part of the budgetary process in March.

4. FINANCIAL IMPLICATIONS

- 4.1 There are no financial implications relating to the identification of various delivery models or assessing options to deliver the Hydrogen Hub with the market as part of a PIN.
- 4.2 While the Energy Transition Fund for the Aberdeen Hydrogen Hub is 100% funded by the Scottish Government, the intention of the Hub programme is to act as strategic investment to lever in up to £28m of additional private and public sector funding to allow commercial entry of a renewable energy supplier, and then to scale up activities and demand for export of green hydrogen in the future¹.
- 4.3 This may therefore offer an opportunity for the Council to invest at an early-stage and also benefit from any financial returns as demand for hydrogen increases over the next 10-15 years. Any specific implications on the Council's capital budget will be brought to the Council's budget in March 2021.

¹ Separately officers are assessing the feasibility of a freeport/ greenport model for the Aberdeen City Region that would seek to clarify the role of the north east as an exporter of green hydrogen.

4.4 The costs of the proposed consultancy and technical advice to identify the optimum delivery model will be met through the City Growth budget, subject to the Council’s budget meeting in March 2021.

5. LEGAL IMPLICATIONS

5.1 The PIN has been published on Public Contracts Scotland as a market research tool. It is hoped that the responses to this PIN will allow officers to identify the most effective model to secure a green hydrogen supply and accordingly the most appropriate route to market. Any route will ensure full compliance with procurement processes.

5.2 When evaluating the PIN responses and the potential project models the project team will consult with the Council’s legal and procurement experts to ensure that the legal implications associated with any contracts, consortiums, joint ventures or other special purpose vehicles are fully understood and evaluated prior to recommendations being made to the Council.

6. MANAGEMENT OF RISK

6.1 As with all major projects, a degree of risk is inherent in the proposals however the work being undertaken by officers is designed to ensure that the proposed delivery and commercial model(s) distribute risk as appropriately as possible between partners and all appropriate risk reduction measures have been undertaken.

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
Strategic Risk	The investment in the Hub proves insufficient to enable commercialisation meaning intended benefits with jobs, training, supply chain, etc. fails to materialise.	M	Open dialogue with potential suppliers. Using the Energy Transition Fund allocation to ensure that an anchor demand is established, lowering the risk to any potential supplier. Contracts that build in jobs, local supply chain benefits and (re)training opportunities.
	Demand does not materialise in line with forecasts	M	Delivery models that place the longer-term viability risk with delivery partners and investors rather than the Council. Active engagement with all partners to facilitate sustainable growth of the sector in line with the City’s aspirations for a hydrogen economy.
		M	

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
	Future investment for subsequent phases is not secured		Ongoing engagement with delivery and investment partners to align investments with demand growth and commercial models structured to limit Council's exposure to future market volatility.
Compliance	Non-compliance with procurement or contractual requirements.	L	Council's Procurement Regulations designed to facilitate compliance with procurement law. All procurement to be done following consultation with Commercial and Procurement Services.
Operational	Insufficient staff resources or expertise to progress actions or deliver and operate assets	M	Prioritise externally funded projects with income potential. Transfer risks around procuring delivery and operational staffing to delivery partners.
Financial	Increase in costs cited in AHH Business Case due to COVID-19, supply chain or exchange rates	M	Cost estimates based on latest prices. Small contingency built into capital budget to accommodate. Arrange flexibility with funding bodies on the potential spend risk. Design commercial models to limit the Council's exposure to delivery risk.
Reputational	Lack of communications / awareness around the Hub and its ambitions.	L	Scale up communications activities and develop the Hydrogen Ambition Statement .
Environment / Climate	Unable to deliver anticipated environmental / climate improvements in line with expectations	L	Ensure that the Hydrogen Hub is progressed in timeous manner so that refuelling is available for when additional hydrogen vehicles are adopted.

7. OUTCOMES

<u>COUNCIL DELIVERY PLAN</u>	
Impact of Report	
Aberdeen City Council Policy Statement	<p>The proposals within this report support the delivery of the following Policy Statement objectives:</p> <p>Economy: 14. Work with both governments to unleash the non-oil and gas economic potential of the city</p> <p>Place: 1. Build up existing strength in hydrogen technology 2. Support efforts to develop inward investment</p>
Aberdeen City Local Outcome Improvement Plan	
Prosperous Economy Stretch Outcomes	The deployment of hydrogen vehicles as part of the long-term plan to deliver the Aberdeen Hydrogen Hub directly support the delivery of LOIP Stretch Outcome 1 – 10% increase in employment across priority and volume growth sectors by 2026. The overall outcome target must be to maintain and grow 36,000 jobs in the energy sector, including renewables. Delivery of the Hydrogen Hub programme will have a direct impact on local jobs (additional technicians, refuelling capability, local supply chain support, training, construction, delivery) and significant potential on GDA of the region and the number of jobs.
Prosperous People Stretch Outcomes	The proposals in this report support the delivery of stretch outcome 11 - Healthy life expectancy (time lived in good health) is five years longer by 2026. Fuel cell vehicles have zero carbon emissions and hydrogen-diesel retrofitted vehicles reduce carbon emissions by approximately 30% compared to their diesel only equivalent.
Prosperous Place Stretch Outcomes	The proposals in this report support and go beyond the delivery of stretch outcome 14 - carbon emissions reduction by 42.5% by 2026 and adapting to the impacts of our changing climate. Renewable hydrogen has zero emissions. ACC's h2 vehicles have saved over 130 tonnes of CO2 in the past 2 years as they run on green tariff produced hydrogen.

Regional and City Strategies	The proposals within this report support the Regional Economic Strategy & Action Plan, Energy Transition Vision, Strategic Infrastructure Plan, draft Regional Transport Strategy 2020, Local Transport Strategy, Hydrogen Strategy & Action Plan and Air Quality Action Plan by proposing establishing Aberdeen as a Hydrogen Hub and rolling out zero emission vehicles
UK and Scottish Legislative and Policy Programmes	The recommendations in this report contribute to the City's response to the Intergovernmental Panel on Climate Change set under the Paris Agreement and the UK Governments ambition to have Net Zero emission by 2045. The report also set out the City's plans to meet the Scottish Government's Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

8. IMPACT ASSESSMENTS

Assessment	Outcome
Impact Assessment	Not required.
Data Protection Impact Assessment	Not required.

9. BACKGROUND PAPERS

- 9.1 COM/20/185 Aberdeen Hydrogen Hub Programme, City Growth and Resources Committee, 28th October 2020
- 9.2 COM/20/0009 Net Zero Vision and Infrastructure Plan Governance, Urgent Business Committee, 30th June 2020

10. APPENDICES

- 10.1 Appendix 1: Assessment of Potential Aberdeen Hydrogen Hub Delivery Models

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Appendix 1: Assessment of Potential Aberdeen Hydrogen Hub Delivery Models

Option	What does this offer?	Pros of the approach	Cons of the approach	Comments
ESCO (Energy Service Company)	An Energy Service Company (ESCO) is a commercial structure created specifically to produce, supply and manage the local delivery of decentralised energy to a 'whole site' development.	<ul style="list-style-type: none"> - ESCOs allow a long term view towards attractive energy prices, security of supply and compliance with ever strengthening carbon regulations. - The ESCO can invest capital into the scheme and assume responsibility for design and build right through to operation, maintenance, billing and delivery of customer care. - It offers a community based, secure and environmentally friendlier energy solution with any excess power generated by the energy centre exported and sold to the market. This would potentially reduce the overall cost of energy supplied to ACC and to the partners within the ESCO. - An ESCO would control pricing and can extract the full social value from the power it supplies. It can help itself, it can help consumers and it can help local companies. - ESCOs can be run on a non-profit distributing basis, allowing special tariffs for the needy, local rates to help the economy and on the basis of not profit first, but public values. 	<p>High initial capital costs and ongoing running costs can be seen as an obstacle to the provision of decentralised energy.</p> <p>No market experience of establishing Hydrogen for wider use – limited customer base at the start.</p> <p>Tight Ofgem rules to gain entry to the market.</p> <p>Market intelligence suggests it is best to do this on a collaborative basis with other Councils to spread risk.</p>	<p>Experience already in ACC of an ESCO – district heating scheme in Aberdeen.</p> <p>Other examples of fully licenced ESCOs are Nottingham City Council (now Enviroenergy Ltd) and Bristol City Council (Energy Service Bristol) which continue to operate and deliver green energy to their respective populations.</p>
Innovation Partnership	The Innovation Partnership Procedure aims to solve an	<p>The benefits of this procedure are</p> <ul style="list-style-type: none"> - Allowing the development of new 	An Innovation Partnership must only be used where:	

Option	What does this offer?	Pros of the approach	Cons of the approach	Comments
	<p>existing problem i.e. organisations not being able to purchase directly from the developer without further competition.</p>	<p>types of goods and services</p> <ul style="list-style-type: none"> - Market stimulation through the appointment of one or several partners. They compete to conduct separate research and development activities funded through the contract - Allowing the choice of the most suitable partners for development contracts - Allowing the purchase of innovative supplies and/or services through the Innovation Partnership. 	<ul style="list-style-type: none"> - there is a need for the development of an innovative product or service and - the subsequent purchase of these cannot be met by solutions already available on the market. <p>The use of this procedure must be justified.</p> <p>There are a number of issues which need to be considered up front, including</p> <ul style="list-style-type: none"> - Pre-procurement activity is vital in order to fully understand the strengths and weaknesses of potential solutions - Clear decision-making processes are vital and negotiation areas well thought through in advance - What could be considered to be a viable solution and when the negotiations might close as a result 	
<p>Joint Venture</p>	<p>A joint venture is when two or more businesses agree to work together. It's effectively a commercial agreement between two or more participants, usually entered into in order to achieve specific business goals such as launching a new type of business</p>	<p>Benefits of joint ventures include:</p> <ul style="list-style-type: none"> - access to new markets and distribution networks - increased capacity - sharing of risks and costs (ie liability) with a partner - access to new knowledge and expertise, including specialised staff - access to greater resources, for example technology and finance 	<p>Joint ventures can pose significant risks relating to liabilities and the potential for conflicts and disputes between partners. Problems are likely to arise if:</p> <ul style="list-style-type: none"> - the objectives of the venture are unclear - the communication between partners is not great - the partners expect different things from the joint venture - the level of expertise and 	<p>There are no laws specifying how joint ventures should be agreed. They can take whatever is best suited to the circumstances and can include (with short definitions)</p> <ul style="list-style-type: none"> - Corporate JV (limited by shares/limited liability company (both offering flexibility for profit distribution and tax efficiencies)

Option	What does this offer?	Pros of the approach	Cons of the approach	Comments
	<p>or selling products into a new market. Each company maintains their separate business structure and legal status, with most joint ventures creating a new, jointly-owned child entity that is effectively at arms reach from the parent companies.</p>	<p>Joint ventures often enable growth without having to borrow funds or look for outside investors. You may be able to:</p> <ul style="list-style-type: none"> - use your joint venture partner's customer database to market your product - offer your partner's services and products to your existing customers - join forces in purchasing, research and development - Another benefit of a joint venture is its flexibility. For example, a joint venture can have a limited lifespan and only cover part of what you do, thus limiting the commitment for both parties and the business' exposure. 	<p>investment isn't equally matched</p> <ul style="list-style-type: none"> - the work and resources aren't distributed equally - the different cultures and management styles pose barriers to co-operation - the leadership and support is not there in the early stages - the venture's contractual limitations pose a risk to a partner's core business operations <p>Partnering with another business can be complex. It takes time and effort to build the right business relationship and, even then, it can be difficult to completely avoid all the issues.</p> <p>Success depends on careful planning and communication. A clear vision and agreement is an essential part of building a good joint venture relationship.</p>	<p>/company limited by guarantee)</p> <ul style="list-style-type: none"> - Contractual JV (the procurement of a private sector partner to deliver relevant elements/ minimising risk to ACC/less ACC working capital required.) New entity required or a Development Agreement (Contractual JV) - Competitive dialogue is still part of the process <p>Any written agreement needs to specify the legal structure of the planned JV –</p> <ul style="list-style-type: none"> - contractual co-operation for a defined project - partnership or unlimited partnership - limited liability company - full merger of the 2 or more organisations