D2N2 Investment Board – July 2022

Confidentiality Level	Restricted ☐	Controlled ☐	Public ■	Commercially sensitive ☐

Meeting and Date	D2N2 Investment Board – 20th July 2022		
Subject	Project for Approval – Hydrogen Fuelled Waste Collection		
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Papers are provided for:	Approval ■	Discussion ☐	Information ☐

Summary and Recommendations
In December 2021, D2N2 allocated £6.5m million of funding from its Growing Places Fund to deliver low carbon priority projects across the region. In total 7 projects were allocated funding and will all receive awards subject to the approval of a Local Assurance Framework (LAF) compliant Green Book Business Case. The delivery of the fund is managed in line with the D2N2 Local Assurance Framework agreed by the LEP Board, which sets out the compliance requirements in relation to the delivery and approval of projects funded through the Low Carbon Growth Fund. This project being put before the Investment board has now been assessed and is being recommended for consideration and approval based on its full compliance with the LAF. D2N2 will contract with South Derbyshire District Council and following an approval D2N2 will release £310,000 of funding through the Low Carbon Growth Fund.

D2N2 Investment Board

Final Business Case – Project for Decision

Low Carbon Growth Fund

Project Name	Hydrogen Fuelled Waste Collection	Project Applicant	South Derbyshire District Council
Construction Start Date	July 2022	Construction End Date	February 2023
Low Carbon Growth Fund requested	£310,000	Total Project cost and Sources of funding	£705,800 Total Cost
Gross Value Added/ Benefit Cost Ratio	2.05:1	Expected Outputs	• 44,706 kg of CO2 saved per year • 1 new job and 30 jobs safeguarded • £35,800 of private sector leverage • 30 learners supported

1.0 Project Description

This innovation project is to pilot the operational introduction of hydrogen powered refuse collection vehicles (RCVs) to deliver local authority waste collection services. It will include the operational and vehicle performance testing of two hydrogen dual fuel (hydrogen/diesel) powered RCVs and the refuelling infrastructure required.

As an innovation project the Council will monitor and track the performance of:

- The hydrogen/diesel hybrid fuelled RCV in a large rural geographical district and compare this with the current diesel powered RCV.
- The hydrogen infrastructure and the additional operational adaptions required for hydrogen RCVs, compared to the current diesel RCVs.

South Derbyshire District Council (SDDC) has 21 RCVs in its fleet that currently services an area of 131 square miles. As a rural District there is a need to pilot the operational capability of Hydrogen RCVs as potentially they are better suited than other low emission vehicles (such as electric) for rural geographies with long distance collection routes.

The performance, operational capability and good practice learnings from this pilot will be useful to other rural Districts in the D2N2 area that are looking to transition to zero carbon emission vehicles. The trial will identify the feasibility of hydrogen fuel use in rural area, the benefits of the specific hydrogen technology required and will provide an opportunity to identify any challenges prior to wider adoption and potential next steps.

The overall responsibility for the delivery of this innovation project is South Derbyshire District Council who will work in collaboration with three supporting partners:

- Toyota Motor Manufacturing (UK) Ltd – supplying the dual fuel RCV base in the north of the district.
- ULEMco – consultants and suppliers of the RCV dual fuel conversion
- Hydrogen refuelling supply – the hydrogen supply service will be procured through a tendering process. Potential suppliers have already been identified and their indicative supply solutions and costings are part of this bid application.

2.0 Summary of Strategic Case/Fit

The Hydrogen Fuelled Waste Collection project fits with multiple strategies at a local and national level including:

D2N2 Recovery and Growth Strategy

Low carbon growth and innovation: this innovation pilot to Hydrogen powered RCV shows low carbon leadership, supports the potential hydrogen infrastructure that is being developed across the D2N2 region and promotes decarbonising growth by promoting alternative fuels.

Productivity: brings together the growing hydrogen jobs, skills, training, and innovation that are being developed in collaboration with high profile business partners (Toyota, ULEMco and Hydrogen Fuel Suppliers) that will support local businesses and services to thrive and make the region an attractive place for future hydrogen investment.

Connectivity & Inclusion: the investment in both the hydrogen economy and skills in a rural district supports the quality of life for residents, workers and visitors and supports the levelling up of rural economies that South Derbyshire represents.

UK Government Strategy

This project also meets the objectives of the UK's path to net zero as set out in the landmark Net Zero Strategy. As part of this UK Government strategy there is commitment to invest in Hydrogen Revenue Support schemes to accelerate green

hydrogen projects and innovation projects. One of the ambitions of this strategy is to work with the transport sector to develop a low carbon fuel strategy for transport and for growing the hydrogen economy and skills sector.	
Assessors Comments	The project has been demonstrated to align with and have strong strategic fit with D2N2's strategies and those of Central Government.

3.0 Summary of Economic Case and expected outcomes

Options analysis

SDDC has taken in to account a variety of different options to deliver this project and the decarbonization of its waste collection fleet. The options exercise has delivered four shortlisted options which include:

1. Remain as is – This option would keep the status quo and requires no additional cost however gets SDDC no closer to achieving its carbon neutral target of 2030 and therefore is not a viable option to take forward.

2. Zero Emission vehicles - Replacing SDDC's current RCV fleet with fully electric or hydrogen powered vehicles is prohibitively expensive, as these replacement vehicles are currently double the costs of equivalent diesel power RCV's. This scale of investment would be beyond the current budget capacity of most local authorities. It is likely that the future cost of fully electric and hydrogen RCV's will significantly reduce as they go from the research and development early adoption stage to mainstream and established. However Local Authorities like SDDC who currently have twenty diesel RCV's to decarbonise and eight years to deliver on their carbon neutral commitments need a cost-effective option.

3. Outsourcing – This option has been discounted due to management at SDDC not seeing this as the way forward. This option does not also help with the removal of emissions as these would still count towards the Local Authorities Scope 3 emissions.

4. Dual Fuel Option – The hydrogen dual fuel option which can be retrofitted to both new and existing RCV's, cost effectively supports the RCV fleet replacement strategy. Dependant on the outcomes of this Project, there is a potential for all existing RCV's to be retrofitted with the benefit of tail pipe emissions being significantly reduced until their end of life. This would give Local Authorities similar to SDDC a cost-effective solution to reducing RCV emissions until zero carbon emission vehicles become established.

The project sponsor has carried out a benefit cost ratio analysis for the project which gives a BCR of 2.05:1, this relies on assumptions of 15% optimism bias and 3.5% Net present value on costs which are both deemed to be fair assumptions.

Assessors Comments	A detailed options analysis has been submitted for the project and the reasoning behind the authorities preferred option has been well thought out and demonstrated as to why this would

	be the optimum choice. The economic case analysis shows that the benefits provided from the project will deliver good value for money against the LEPs investment.

4.0 Summary of Commercial Case

The purpose of the Commercial Case is to assess the best way of delivering the preferred Hydrogen Fuelled Waste collection project and setting out the structure of the arrangements. i. Market Analysis Financing - Match funding from SDDC will be part of the current vehicle replacement strategy. Asset Prices – Asset price for dual fuel RCV is likely to be similar to vehicles that are being replaced. Capacity – Waste sector collection capacity for a low or zero carbon fuel alternative is growing as local government gears up for carbon neutral targets. Consumer Demand – Waste sector market is stable, although as South Derbyshire's population is growing, the demand for low carbon collection services will increase. Business Demand – Increasing demand for hydrogen vehicle solution and for hydrogen fuel supply. Employment – increasing demand for hydrogen employment roles and skills. Hydrogen market demand and supply is likely to grow over the next decade. The retail cost per kg is currently much higher than diesel and is likely to remain that way for the next few years. It is expected that the cost differential will reduce as demand and supply of hydrogen increases. ii. Delivery Arrangements The business case clearly sets out the responsible parties who will be in charge of delivering the scheme and key lines of responsibility. Further information is included in section 6.0 of this business case.	
Assessors Comments	The submitted business case is considered to address market demand for the less environmentally damaging refuse collection service. The delivery arrangements for the project are well thought out and show clear lines of responsibility.

5.0 Summary of Financial Case

Subsidy Control

The project will not considered a prohibited subsidy as South Derbyshire District Council is acting as the project sponsor and providing a service which is not otherwise provided by the private sector. Therefore the use of this grant has no affect on a competitive market or undermines competition.

Assessment of Risk

The principal risks that are relevant to the funding include:

- Site conditions – The site for hydrogen refuelling and storage may not be suitable for delivery. The project sponsor is working with TMUK and utilising the expertise of Hydrogen Suppliers to ensure that alternative locations are in place should conditions not be suitable.
- Procurement issues – Timescales for procurement and costs for equipment may either be delayed or increased. The project sponsor has engaged with the suppliers in pre-procurement to ensure that costings and timings are accurate.
- Cost of Hydrogen – Potential increases to the cost of Hydrogen which may affect the delivery of the project. This will be negotiated in the procurement process and guarantees over price will be sought.

Key equipment costs

Key components	Cost £
2 x RCV's	360,000
2 x Dual Fuel Conversion units	100,000
Performance analysis software	50,000
Site Welfare Unit and infrastructure	80,000
Hydrogen use, supply and refuelling	40,800
Site Civils Works (security and power supply)	10,000
Project Resource	30,000
Operator, Health, and Safety Training *	25,000
Site cost provision*	10,000

Assessors Comments	The project makes a good case for intervention and does not go against subsidy control measures. The principal risks are around the site and delivery of Hydrogen, these have been recognised early and show sound mitigations to combat any issues should they arise.

6.0 Summary of Management Case

The Management Case sets out the governance arrangements for the delivery, monitoring and evaluation of the Hydrogen Fuelled Waste collection project.

i. Governance and Management arrangements.

Clear governance and management arrangements are set out for the delivery of the project and the evaluation period to determine the success of the scheme. SDDC have provided a hierarchical structure of named individuals who will own the project and assure the LEP that the outcomes promised are met. This includes both officers of the council and representatives from the partnering organisations as part of the project resource team. SDDC's Section 151 officer will be responsible for overseeing the expenditure on the project.

ii. Programme Plan

The project sponsor has provided an overarching programme for the delivery of the programme alongside target dates for the completion of each section of the procurement. The programme is currently:

- Procurement Completion – July 2022
- Supply chain engagement and delivery – December 2022
- Programme Launch – December 2022
- Programme Delivery – Jan 2023 – December 2023
- Final reporting – March 2023

iii. Risk Management

The business case provided by SDDC has taken into account multiple risks which are identified by the sponsor related to the scheme. These include both internally and externally affected risks to the project, the sponsor has provided mitigations to help solve potential issues.

iv. Monitoring and Evaluation

The Project Outputs will be the information, monitoring data, analysis and detailed learnings of the RCV performance, Operational use of Hydrogen and Operational

Behaviour of this complete Project lifespan from inception to delivery end. The main components of the Project output and reporting are shown below:

RCV Performance	Operational Use of Hydrogen	Operational Behaviours
Comparisons between diesel and hydrogen dual fuel. *	Supply, storage and use of Hydrogen. *	Driver and team behaviour changes. *
Fuel used and mpg	Unit costs and service prices*	Training delivered
Distance travelled	Amount used/stored	Mpg comparisons
Number of pickups	Refuelling time	Scheduled operator feedback
Time taken for collections	Refuelling issues	Feedback changes
Carbon emissions	Supply chain timeframes	Customers feedback
Downtime	Supply chain issues	Suppliers feedback
Maintenance time	Maintenance time	Partners feedback
Number of breakdowns	Number of breakdowns	Back-office feedback

In addition to the final Project Output Reporting, SDDC will deliver a quarterly return report that will set out the spend, output achievements and progress of the Project against the agreed profile.

Assessors Comments	The project sets out good management arrangements with named individuals who will own and manage risk. The projects programme is well thought out and sets out realistic timescales for delivery. As well as the information about the infrastructure delivery, the applicant has also planned how the project will be monitored well and given details into the evaluation of the project to demonstrate success.

7.0 Assessors and Officers Recommendation

The following recommendations are proposed as a condition of any award of Low Carbon Growth Fund from D2N2 LEP to this project;

i. Confirmation that the project provides Value for Money from the external economic case assessment.
ii. A profile of drawdown of Low Carbon Growth Funding

Low Carbon Programme Fund Checklist

1. A detailed 'Green Book' compliant business case has been completed detailing the project and its alignment to the 5-case model. 'The Checklist[1]' published by HM Treasury is a useful one-page guidance paper.	*South Derbyshire District Council have prepared a green book compliant business case which aligns to the standards set out by HM Treasury.*
2. A VFM assessment must be completed. This VFM assessment will be independently assessed by D2N2 and must show an overall score of 'High'.	*SDDC have carried out economic analysis which shows the project provides a BCR of 2.05:1 which demonstrates 'High' value for money*
3. Details confirming that all planning consents have been granted and that all pre start conditions have been met.	*All planning permissions are in place for the project.*
4. Confirmation that any Section 106 or other agreements have been entered into.	*Not applicable to this development*
5. Confirmation of the results of the procurement exercise detailing: -the tenders received (along with detailed costs) -the tender accepted (along with timescales/conditions)	*The project is due to be tendered through a variety of separate frameworks which SDDC has direct access to. The individual elements of the project will be either procured through mini tender or direct negotiation through suppliers found through these frameworks.*
6. Details of the construction contract to be entered into by the promoter detailing: -start date -completion date -liquidated damages/cost over runs	*The project has begun in May 2022 with the carbon capture equipment starting to be installed. This enables the other components to be installed in the following timeframes:* *- Package 1 – Commences July 2022* *- Package 2 – Commences October 2022* *- Package 3 – Commences December 2022*
7. Confirmation that the promoter will be responsible for any variations to the contract price and that once entered into, the contract will be completed in line with	*SDDC has provided the D2N2 LEP with assurances that they will not be liable for any cost overruns and the project sponsor will accept these should they arise.*

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/190603/Green_Book_guidance_checklist_for_assessing_business_cases.pdf

the details submitted. The promoter should submit a separate letter appended to the Business Case which confirms this from their Financial Director or equivalent.	
8. Confirmation that the project has been designed to RIBA stage 4 or its equivalent.	*RIBA Stage 4 is not applicable for this project however the designs have been completed by industry experts.*
9. Details of any outstanding points preventing/delaying the start-up of the construction contract.	*The project team have given no indication of any reasons for delay at the time of submission.*
10. Details of any changes for the project form the initial EOI and OBC submissions with reasoning behind these changes. Including an updated viability report as submitted in point 5 of the OBC.	*No significant changes are in place from the original EOI submission.*
11. Confirmation that all funding is now in place with details of the sources of funding, please include letters from third party funders confirming any conditions and timescales.	*The business case sets out all match funding for the project which has been confirmed by letters from the applicant.*
12. Confirmation that all land/legal agreements have been completed and are in the control of the promoter to deliver the entire project	*Toyota Manufacturing UK have provided 3 identified and suitable locations at their Burnaston site which will be finalised on completion of the grant agreement.*
13. A phasing plan identifying the start and completion elements of the project along with costs associated with each phase and the outputs/outcomes that will be delivered on a quarterly basis.	*The project sponsor has provided details of when the project phases will start and finish for the scheme. Outcomes are profiled for the LEP to monitor on an ongoing basis.*
14. An updated risk register identifying the key risks and the project manager responsible. The risk register needs to be scored and include a mitigation plan.	*A risk register has been prepared by the project sponsor and has set out mitigations which will solve any issues that may arise.*