Project Name	AECC Low Carbon Refuelling Station	**Date**	12/02/18
Author	Laura Paterson	**Version**	1

Contents

1. Business Need

The UK Government has announced that the sale of new diesel and petrol vehicles will be banned from 2040, with the Scottish Government reducing this deadline further to 2032. The upscaling of Ultra-Low Emission Vehicles (ULEVs) needs to be supported through the promotion of the technology to the public and business sectors and development of the infrastructure to support the vehicle deployment.

National statistics demonstrate that there will be a significant increase in ULEVs. The UK Committee on Climate Change states that ULEVs will need to account for 16% of total car sales by 2020, 60% by 2030 and 100% by 2040 to meet low emission targets. Transport Scotland's Annual Transport Statistics Reports estimate levels of growth for car sales and total vehicle numbers across Scotland. Since, 2013, there has been an annual increase n ULEVs with numbers in the city doubling year-on-year. Based on these government figures, it is estimated that Aberdeen will have 29,545 low carbon vehicles by 2030. Infrastructure needs to be in place by this date to support refuelling demand.

Transport Scotland's Low Carbon Travel and Transport (LCTT) Challenge Fund aims to facilitate the delivery of active travel and low carbon transport hubs. Grants of up to 70% are available to support projects with total costs of up to £2million.

Participation in this project will facilitate the development of a Low Carbon Refuelling Station at the site of the new AECC. The AECC Refuelling Station will provide refuelling facilities for low carbon vehicles. This infrastructure will consist of rapid recharging points, akin to traditional fuel dispensers, for electric vehicles and hydrogen refuelling facilities similar to the existing site at Langdykes Road in Cove for hydrogen vehicles.

This project will have a capital budget of £1,479,467. The maximum intervention rate of the LCTT Challenge Fund is 70%. This rate has been applied in the application and a grant of £1,035,627 requested from Transport Scotland. The remaining £443,840, representing 30% of the estimated capital costs is required to be provided by Aberdeen City Council.

The AECC design incorporates an Energy Centre which is an onsite testing and demonstration facility for renewable energy technologies. This includes an onsite electrolyser which can produce high grade hydrogen which could be used as a transport fuel with the correct supporting infrastructure. The development of a new hub at the AECC site will enable this hydrogen to be used, including for vehicle refuelling. There will also be facilities for refuelling of electric vehicles. This will be designed as a traditional refuelling station, with rapid electric charging dispensers instead of plug-in infrastructure. This will be a first in the city.

The success of the AECC Refuelling Station will be dependent on demand for ULEV refuelling infrastructure. There are projects and discussions ongoing to increase hydrogen vehicles in the city, including the introduction of roadsweepers and garbage trucks to ACC Fleets, additional hydrogen buses and working with taxi companies to integrate ULEVs into

existing fleets.

Objectives for this project, as outlined below, have been identified from several local and regional strategies, including the Regional Economic Strategy, Local Transport Strategy 2016-21, Aberdeen City & Region Hydrogen Strategy and Action Plan 2015-25, Powering Aberdeen and the Local Outcome Improvement Plan 2016-26.

2. Objectives

List the project's objectives. Make these tangible and clear as they will influence which option is recommended and will be used to monitor project progress and success.

1. Develop low carbon vehicle refuelling infrastructure;
2. Expand production and distribution of renewable hydrogen;
3. Facilitate the uptake of ultra-low and low emission vehicles (ULEVs) as a contribution towards improving air quality in Aberdeen;
4. Maximise the potential of hydrogen and other renewable technologies to develop a medium-long term demand for the transferable skills in the oil and gas sector

3. Options Appraisal

3.1 Option 1 – Do not accept grant

Description	Do not accept grant, if successful with grant application
Expected Costs	None
Risks Specific to this Option	A successful LCTT Challenge Fund application would result in external funding of £1,035,627 which would contribute to a total project budget of £1,479,467 to deliver a strategically placed low carbon refuelling station in the city. Not accepting a grant would result in a loss of over £1m in external investment to key city infrastructure.
Advantages & Disadvantages	Advantage: • No cost at present Disadvantages: • Loss of investment of over £1m • May have to implement infrastructure at future date with potential significant increase in delivery costs

3.2 Option 2 – Accept grant	
Description	Accept LCTT Grant, if successful with grant application
Expected Costs	**Capital Costs** Total Costs £1,479,467 Max Grant £1,036,627 Match Funding £443,840 **Revenue Costs**

	Year 1 £	**Year 2 £**	**Year 3 £**	**Year 4 £**	**Year 5 £**
Income					
Refuelling Fees	**(19,934)**	**(29,433)**	**(42,342)**	**(57,488)**	**(74,373)**
Expenditure					
Maintenance	**49,500**	**49,500**	**49,500**	**49,500**	**55,500**
Operating Deficit/ (Surplus)	**29,566**	**20,067**	**7,158**	**(7,988)**	**(18,874)**

Risks Specific to this Option	Match funding of £443,840 is required from ACC to support the development of the AECC Low Carbon Refuelling Hub. The station is likely to run at an operating deficit for the first three years upon completion as the number of ULEV vehicles expands. Revenue costs are presented above. The operating deficit of the site will be required to be met from another source. The Energy Centre is anticipated to make an annual profit of £4m – these profits could be used to subsidise the Refuelling Station in the first three years of its opening at a total cost of £56, 791 in the first three years.
Advantages & Disadvantages	Advantages: • Supports a number of strategic aims within the city; • Leverages 70% of total project costs from external sources; • Budget has been identified as source for capital match funding; • Two profit making projects have potential to contribute to initial revenue deficit; • Continues expansion of low carbon technology, transport and infrastructure in the city

	Disadvantages: • Long-term investment as it is anticipated to be three years before the fuelling station reaches capacity and becomes profitable

3.3 Scoring of Options Against Objectives

Use the table below to score options against the objectives in order to create a shortlist of options to be considered.

Objectives	Options Scoring Against Objectives							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Develop low carbon vehicle refuelling infrastructure	-1	3	0	0	0	0	0	0
Expand production and distribution of renewable hydrogen	-1	3	0	0	0	0	0	0
Facilitate the uptake of ultra-low and low emission vehicles (ULEVs) as a contribution towards improving air quality in Aberdeen	-1	2	0	0	0	0	0	0
Maximise the potential of hydrogen and other renewable technologies to develop a medium-long term demand for the transferable skills in the oil and gas sector	-1	1	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Total	-4	9	0	0	0	0	0	0
Ranking	2	1						

Scoring

Fully Delivers = 3
Mostly Delivers = 2
Delivers to a Limited Extent = 1
Does not Deliver = 0
Will have a negative impact on objective = -1

3.4 Recommendation

It is recommended that Aberdeen City Council accepts a grant from the LCTT Challenge Fund.

4. Scope

Develop a low carbon refuelling station at the AECC which will provide rapid refuelling for low carbon vehicles with fuelling provided by low carbon energy from the Energy Centre and AD Plant. The uptake of low carbon vehicles will be promoted through engagement with local partners, such as taxi companies and car clubs.

4.1 Out of Scope

Projects to create increased demand and generate financial support to increase low carbon vehicles in the city will run parallel to this project. These include partnership building with the private sector, such as taxi fleets and the airport, to increase vehicles numbers by accessing OLEV (Office for Low Emission Vehicles) funding. Further projects to support city fleets, including refuse trucks and cargo pedelecs are also being developed. Whilst out of scope of this project, their success and implementation will impact financial sustainability of this project.

5. Benefits

5.1 Customer Benefits

Benefit	Measures	Source	Baseline	Expected Benefit	Expected Date	Measure Frequency
Access to a rapid electric vehicle refuelling station, as opposed to relying on finding a charge up point in Aberdeen.	Number of refuels on standard day	Refuelling Station	3 (first six months – expected incrementation)	Continued increased usage	31/12/19	Six monthly
	Number of refuels on busy day	Refuelling Station	6 (first six months – expected incrementation)	Continued increased usage	31/12/19	
Access to a reliable hydrogen refuelling station in a strategically placed area of the city	Number of hydrogen refuels	Refuelling Station	400 (first six months – expected incrementation)	Continued increased usage	31/12/19	
	Amount of hydrogen production per day	Refuelling Station	200kg	Ability to meet demand	31/12/19	
	Operation availability	Refuelling Station	96% (first six months – expected incrementation)	Provision of reliable service	31/12/19	
	Number of people trialling vehicles	Car club	100	Continued increased uptake of	31/12/19	

				vehicles		
	Registered ULEVs in Aberdeen City	Government Licencing Statistics	637	Continued increased uptake	31/12/19	

5.2 Staff Benefits

Benefit	Measures	Source	Baseline	Expected Benefit	Expected Date	Measure Frequency
Continued expansion of knowledge and experience of developing hydrogen technologies – primarily production of “green” hydrogen						

5.3 Resources Benefits (financial)

Benefit	Measures	Source	Capital or Revenue?	Baseline (£’000)	Saving (£’000)	Expected Date	Measure Frequency
External funding to support 70% of construction costs	Level of saving	LCTT Challenge Fund	Capital	£1,479,467	£1,035,627	31/12/19	Quarterly Reports
	Revenue stream through sale of fuel (Measures taken from Y4 when refuelling station expected to start making a surplus)	Refuelling Station	Revenue	£57,488	£7,988	31/07/23	Annual

6. Costs

6.1 Project Capital Expenditure & Income

(£)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Staffing Resources	29,792										29,792
Land Acquisitions											
New Vehicles, Plant or Equipment											
Construction Costs	£1,449,675										1,449,675
Capital Receipts and Grants	(£1,035,627)										(1,035,627)
Sub-Total	**£443,840**										**443,840**

6.2 Project Revenue Expenditure & Income

(£)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Staffing Resources											

Non Staffing Resources											
Revenue Receipts and Grants											
Sub-Total											

6.3 Post- Project Capital Expenditure & Income

(£)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Staffing Resources											
Land Acquisitions											
New Vehicles, Plant or Equipment											
Equipment					12,450					10,700	23,150
Construction Costs											
Capital Receipts and Grants											
Sub-Total					**12,450**					**10,700**	**23,150**

6.4 Post- Project Revenue Expenditure & Income											
(£)	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Total**
Staffing Resources											
Management		1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	15,000
Non Staffing Resources											
Maintenance of the station	49,500	49,500	49,500	49,500	55,500	49,500	49,500	49,500	49,500	66,200	517,700
Revenue Receipts and Grants											
Income from refuelling	(19,934)	(29,433)	(42,342)	(57,488)	(74,374)	(106,227)	(129,139)	(154,792)	(182,463)	(212,490)	(1,086,682)
Sub-Total	**31,066**	**21,567**	**8,658**	**(6,488)**	**(17,374)**	**(55,227)**	**(78,139)**	**(103,792)**	**(131,463)**	**(144,790)**	**(553,982)**

7. Procurement Approach

The Refuelling Station will consist of a single procurement exercise, adhering to ACC and EU Procurement regulations, for delivery of the Station with option to operate for a ten year period.

8. Key Risks

Description	Mitigation
Delay in station delivery Grant funding is dependent on the project being completed by the end of 2019	The AECC Refuelling Station can be treated as a stand-alone project with timescales which allow for the necessary procurement processes to occur. A feasibility study has already been undertaken which will inform the ITQ.
Budget Increased costs result in budget overspend	The cost estimates for the project have been developed with the support of Hydrogenics who have an in depth knowledge of the site, so a realistic budget has been created.
Demand Underuse of the facility threatens financial sustainability of project	Over 900,000 people are anticipated to visit the new AECC each year providing vast opportunity to promote the hub to audiences. Projects are in development which will increase city fleets of low carbon vehicles in both the private and public sector. A second fuelling station in a strategic location encourages uptake of these vehicles as it enables a fast, reliable and convenient refuelling process. Government statistics anticipate a significant growth of ULEVs in the future in line with Government policy and local government initiatives which encourage low carbon vehicles, such as the introduction of low emission zones.

9. Time

9.1 Time Constraints & Aspirations

The AECC Refuelling Station is anticipated to be completed in July 2019, in line with the AECC timeline. A test period will follow with the station open to the public in August 2019.

The project must be complete by December 2019, in line with grant stipulations.

9.2 Key Milestones

Description	Target Date
MS1: Prepare bid documentation for lead contractor and submit planning application	May 2018
MS2: Appoint Lead Contractor and obtain planning permission	November 2018
MS3: Building Works Commence	January 2019
MS4: Civil Works Complete	March 2019
MS5: Erection of building canopy complete	June 2019
MS6: Installation of plant	June 2019
MS7: Testing of equipment	July 2019
MS8: Refuelling station opens	August 2019

10. Governance

The project approach will be incorporated into the existing AECC Project governance structure.

Role	Name
Project Sponsor	Steve Whyte
Project Manager	Scott Ramsay
Other Project Roles	Laura Paterson

11. Resources

Task	Responsible Service/Team	Start Date	End Date
Project Management	Capital, Projects Team	01/05/18	31/12/19
Project Support – Compliance with grant programme	Capital, External Funding Team	Present	31/12/19

Procurement - Ensuring compliant tenders, contracts, etc in place	CPS	01/05/18	30/11/18
Legal – Review grant agreement	CPS	01/04/18	31/05/18
Planning – Review and approve site plans	Planning	01/05/18	30/11/18
Transport – Identify opportunities for encouraging low carbon transport	Transport	01/06/19	31/12/19

12. Environmental Management

The AECC Low Carbon Refuelling Station will have a positive environmental impact. ULEVs significantly reduce air and noise pollution which has a positive impact on public health. The electricity and hydrogen is produced from renewable energy from the Energy Centre – a conversion of waste to biomethane – ensuring a Circular Green Economy onsite.

13. Stakeholders

AECC Project Board – Interest in impact of Refuelling Station on wider AECC Project. Kept updated through monthly board meetings

Energy Centre Operator – Provision of a reliable fuel supply for refuelling station

SMG (AECC Operator) – Opportunities to work with Education Space in exhibition centre to promote low carbon vehicles

Co-Wheels – Promotion of low carbon vehicles through trialling opportunities which will contribute to financial sustainability created by demand

Private & Public Companies – Inclusion of low carbon vehicles in fleets will create demand on site and ensure financial sustainability of station

14. Assumptions

The AECC development is delivered to time and below budget to allow the current contingency to be used for this project.

It is assumed that Aberdeen City Council will introduce a charge to refuel electric vehicles in future will which contribute to the station's revenue stream.

15. Dependencies

The successful operation of the Energy Centre which will supply the hydrogen to the fuelling

station.

The successful development of projects which increase ULEVs in the city And thus demand for the refuelling infrastructure.

16. Constraints
The project must be completed by December 2019 as per grant stipulations.

17. ICT Hardware, Software or Network infrastructure		
Description of change to Hardware, Software or Network Infrastructure	**EA Approval Required?**	**Date Approval Received**
n/a		

18. Support Services Consulted

Service	Name	Sections Checked / Contributed	Their Comments	Date
PMO				
Finance	Helen Sherritt & Scott Paterson	Checked and Contributed to Committee Report	This business case reflects any comments made	16/01/18
Asset Management				
Estates				
Legal (Conveyancing)	Elena Carlisle & Lisa Christie Ken Cumming	Checked and Contributed to Committee Report Checked and contributed to Committee Report	This business case reflects any comments made	16/01/18 13/03/18
Legal (Procurement)	Elena Carlisle & Lisa Christie	Checked and Contributed to Committee Report	This business case reflects any comments made	16/01/18
Procurement				
ICT				
Architecture and Design Team				

Grounds Maintenance				
Environmental Policy				
Planning				
Communications				
HR				

19. Document Revision History			
Version	**Reason**	**By**	**Date**