

Item: 20

Policy and Resources Committee: 19 June 2018.

HYSEAS III Hydrogen Ferry Project.

Report by Executive Director of Development and Infrastructure.

1. Purpose of Report

To consider the Council's participation in the HYSEAS III Hydrogen Ferry project following the successful application for Horizon 2020 funding.

2. Recommendations

The Committee is invited to note:

2.1.

That, in March 2017, the Council accepted an invitation to become a consortium member of the HYSEAS III project, subject to no financial or other commitment at this stage other than staff resource, ferry operations expertise and access to information relating to future ferry needs, the Surf n'Turf project and the BIG HIT project.

2.2.

That, following an unsuccessful bid by the HYSEAS III consortium for EU funding in respect of a project to demonstrate a hydrogen propulsion system, due to there being no pathway through to construction of an actual ferry, a short notice revised bid, on EU advice, to seek funding from Horizon 2020 for a project with an exploitation route through to a working ferry was successful in securing €9,300,000.

2.3.

That expansion of the project from a technical demonstrator to a working ferry requires a much greater staffing and financial involvement from the Council than previously indicated in paragraph 2.1 above, due to the Shapinsay route being identified by the consortium as the ideal location for trials of a working hydrogen RoRo ferry.

2.4.

That, although overall project lead and the administration role has been assigned to St Andrews University, the Council will take the project lead on the operational specification of the vessel and its shore interfaces, as well as any subsequent trials, training and introduction to service, should the project move to the actual construction of a ferry.

2.5.

That the Council's share of the Horizon 2020 grant funding, referred to at paragraph 2.2 above, amounting to €643,000, represents 100% funding, predominantly costs associated with the provision of a specialist project team and sea staff.

2.6.

That, for the programme to progress beyond the technical specification and power system demonstration phase, additional financial commitment will be required from the Scottish Government in respect of the construction of the ferry and associated infrastructure, for which the consortium has received a letter of support from Transport Scotland.

2.7.

That the Council has signed the Consortium Agreement for HYSEAS III, inclusive of 100% funding for the Orkney elements of the demonstration phase of the project and, subject to final EU authorisation, the formal project launch is expected on 18 June 2018.

It is recommended:

2.8.

That the Council's participation in the HYSEAS III hydrogen ferry project, inclusive of 100% funding for the Orkney elements of the demonstration phase of the project, be homologated.

3. Introduction

3.1.

At its meeting held on 16 February 2017, the Development and Infrastructure Committee noted:

3.1.1.

That the Scottish Government's climate change policies indicated aspirations for lower, and ideally zero, emission transportation.

3.1.2.

That the Council was currently involved in two hydrogen projects, Surf n'Turf and BIG HIT, which saw the production of hydrogen converted to electricity, and hydrogen being used in hydrogen powered vehicles.

3.1.3.

That a project had been developed, HYSEAS III, which aimed to take the concept of a hydrogen powered passenger and vehicle ferry through to a construction project, as detailed in section 5 of the report by the Executive Director of Development and Infrastructure.

3.1.4.

That the Council, as a ferry service provider, had been invited to become a consortium member of HYSEAS III, which included Transport Scotland as an associate member.

3.1.5.

That membership would not, at this stage, commit the Council to any particular course of action or to any additional costs, as detailed in section 5.6 of the report by the Executive Director of Development and Infrastructure.

3.2.

The Committee recommended that the invitation to become a consortium member of the HYSEAS III project be accepted, subject to no financial or other commitment at this stage other than staff resource, ferry operations expertise and access to information relating to future ferry needs, the Surf n'Turf project and the BIG HIT project.

4. Background

4.1.

As outlined in section 3 above, on 16 February 2017, the Development and Infrastructure Committee considered a report on HYSEAS III, a proposed project to develop a hydrogen propulsion system for a RoRo ferry.

4.2.

At that stage, the intention was that the Council would join the HYSEAS III consortium, with minimal financial commitment and a limited staff involvement in order to capture Orkney knowledge of ferry and hydrogen activities and no financial impact to the Council. However, the subsequent EU funding bid by the consortium was not successful on the basis that the project did not demonstrate a 'route to market' or 'exploitation path' for the intended technology development.

5. Revised Project

5.1.

On the advice of the EU funding authorities for technology based projects, a more ambitious project for Horizon 2020 funding was therefore initiated with the outcome being a fully operational hydrogen ferry. On the basis that full demonstration of the technology to be developed required an operational ferry being tested on and then deployed to a working ferry route, it became essential that a trials location and operational route was selected and that a ferry operator became a full member of the consortium.

5.2.

Orkney, with its previous, though limited, involvement in HYSEAS III, its track record on hydrogen for its Big Hit, Dual Ports and Surf N Turf projects, its hydrogen production aspirations and its ideal location for a low stress and relatively short ferry route to Shapinsay, was considered to be the ideal operational partner.

5.3.

The revised funding application, which incorporated a significant revenue funding package for the Council in relation to project/manpower costs for involvement in the design, trials, operational testing and shore side infrastructure needs assessment aspects of the project, was considered under an alternative funding programme by Horizon 2020 in early 2018. On this occasion the project achieved a near perfect score which was well above the threshold for funding, resulting in an allocation for the full amount requested.

5.3.1.

The following is an abstract from the H2020 project website and provides the official overall concept of the revised HYSEAS III project:

“The HySeas III project will bring to market the world’s first zero emission, sea-going ferry that will be powered by hydrogen from renewable sources. It builds on the pioneering experience of the coordinator (Ferguson Marine), which previously developed the first diesel/electric hybrid ferry in 2013, and involves the leading European supplier of hydrogen fuel cell modules (Ballard Power Systems). The project will not only develop and validate this advanced ferry concept but a prototype version will be constructed and demonstrated in operational service with co-funding from the regional Government in Scotland (which will commission the building of the ferry). It will also demonstrate a novel circular economy model for the local production of hydrogen fuel that could transform the coastal and island economies around Europe. It will be implemented by eight complementary partners, from six countries (BE, DE, DK, FR, NO, UK), through seven interrelated work packages. These include the development and land-side testing of the complete drivetrain, integration within a new concept ferry design and monitoring of its performance in a real island-to-island environment (Orkney Islands). In addition, there will be a dedicated work package aimed at rapid exploitation based on evidence from the marine trials and an innovative business model to overcome the capital investment barriers to replication. The communication and dissemination work package will include engagement with potential follower regions across Europe and be led by the European Office of Interferry, which represents the worldwide ferry industry. Other relevant European associations and networks will participate in a ‘Stakeholder Advisory Group’ to ensure that the results are widely disseminated to all interested parties”.

5.3.2.

The overall project cost is €12,600,000 and the total grant is €9,300,000. On the basis that the Council is a public body and not for profit, the bid included 100% of the Council's costs thereby maintaining the position at the original approval for HYSEAS III participation of no net cost to the Council. Industry applications were not eligible for the 100% allocation and they will make a contribution to their costs. The project participants and full funding package is as follows:

Participant	Country	Role	Resource Requirement (Euros)	EU Allocation (Euros)
University of St Andrews	UK	Project administration and academic analysis	0.413m	0.413m
Fergusson Marine Engineering Ltd	UK	Ship design and build	3.868m	2.708m
Kongsberg Marine	Norway	Marine propulsion	2.982m	2.087m
Ballard Power Systems Europe Ltd	Denmark	Fuel cell development and construction	3.81m	2.668m
Orkney Islands Council	UK	Operational requirement, shore interface and vessel trials demonstration	0.643m.	0.643m
DLR Institute Fur Vernetzte Energiesystems	Germany	Renewable energy solutions.	0.483m	0.483m
McPhy Energy	France	Integrated hydrogen systems	0.328m	0.230m
Interferry	Belgium	Ferry industry specialist advice	0.122m	0.122m

5.4.

The basis of the revised funding application was a defined exploitation route and hence, the project had to demonstrate the pathway to the construction of an operational hydrogen ferry for the Shapinsay route. The funding detailed above is for development of the propulsion technology, its demonstration at sea and, unlike the initial application, transition to an operational ferry and its shore infrastructure.

5.4.1.

The capital cost for the ferry construction and any shore infrastructure aspects are separate and hence, a letter of intent and support from Transport Scotland was crucial in achieving the successful application. It will therefore be for Transport Scotland to implement its letter of support as and when this additional funding is required. Should that funding not be forthcoming or should the demonstration phase fail, the project would be terminated at that stage and any unused funds for the at sea phase would not be required.

5.5.

Whilst the project initiation and the formal Consortium Agreement process is underway with consortium members, an official announcement has yet to be made. It is anticipated that this will take place on 18 June 2018 by which stage all the project approvals and legal aspects, which are being administered by the University of St Andrews, should be in place. The project will then proceed with the technical development of the power system alongside the design of the vessel, the trials plan and development of the operational specification of the vessel and infrastructure.

5.5.1.

The Council, as the expert ferry operations partnership member, has a key role in providing advice with regards to these three elements. Although the vessel will not belong to the Council, the intention that it is trialled and then, hopefully used, on the Shapinsay route using Council and Orkney Ferries Limited staff makes it crucial that the Council has a lead role in these elements of the project. The current project indicates that vessel construction, under additional Scottish Government funding, could commence some 15 months after project launch and an understanding the vessel should arrive in Orkney some 15 to 18 months after that.

5.6.

It is envisaged that, eventually, the vessel will be operated by Orkney Ferries Limited and its sea going staff, or by whatever arrangement is in place at that time, and that Orkney Islands Council shore staff, including shore based engineers, will have a crucial role once the vessel is at sea and operating either as a trials vessel or on the route.

5.6.1.

There will therefore be a requirement for some specialist sea staff to be employed by the Council or by Orkney Ferries Limited if appropriate on, in the first instance, a temporary basis. Up to that point, the project participation will involve additional shore based staff funded by the grant allocation and by staff already in post, all of whom will require appropriate training under the project budget.

5.7.

For governance purposes, it is anticipated that the project will be governed through the Hydrogen Board and, in due course, the Board of Orkney Ferries Limited for ferry operations at sea and the Harbour Authority Sub-committee for any harbours elements when the operational trials and route running commences.

6. Human Resource Implications

6.1.

The expansion of the HYSEAS III project from that initially envisaged means that there are now some HR implications and that for Orkney Islands Council and its wholly owned entity of Orkney Ferries Limited, the new funding allocation for HYSEAS III will be predominantly for the provision of additional specialists with skills in technical project management, marine/gas engineering and, in due course, sea going operations of gas/electric powered vessels. The outline project schedule sets out when those skills will be required and in what numbers and it is clear that a number of them will require the establishment of new posts, initially on a temporary basis, as current staff, though possessing some of the skills, do not have the capacity to be fully involved in HYSEAS III. For some skills, those will be developed through the training of current staff.

6.2.

Given the skills required, recruitment would be easier if the posts were permanent but unless, and until, the development stage of the project is successful and funding is secured for the vessel construction, it is likely that most, if not all, of the posts will initially be for periods of up to 2 years. It is therefore likely that a range of HR processes including the creation of temporary posts, increasing the scope of some current posts, secondment and, on occasions, the short term engagement of highly specialist individuals from industry, will be used. Should it become necessary to extend temporary posts or to make changes permanent, the appropriate approval mechanisms through the committee process will be implemented.

6.3.

The funding available relates to 5 man years of work but that will be shared across a range of dedicated new staff, the allocation of current staff, temporary staff, specialist support and training. This will require a staff management plan which will be developed over the course of the first two months after project launch.

7. Environmental Implications

The project is clearly designed to have a positive environmental impact and nothing is envisaged from the sea going or harbours perspective which would require a Strategic Environmental Assessment (SEA). However, it may be that the infrastructure and systems to produce and store hydrogen in large volumes would require a SEA but this is beyond the scope of this element of the project or of the Council involvement at this stage. This will therefore be considered at a later stage if and when the project identifies the need for a SEA.

8. Links to Council Plan

The proposals in this report support and contribute to improved outcomes for communities as outlined in the Council Plan strategic priorities of Connected Communities and Enterprising Communities.

9. Links to Local Outcomes Improvement Plan

The proposals in this report support and contribute to improved outcomes for communities as outlined in the Local Outcomes Improvement Plan priority of A Vibrant Economy.

10. Financial Implications

10.1.

Although the initial HYSEAS III project involvement envisaged little or no financial impact on the Council, the revised project has financial implications and the Council's element of the funding bid was based upon 58 man months of work plus associated training, travel and management support/project management at a budget value of €643,000. This amount has been allocated in full and on a 100% basis due to the public and non-profit nature of Orkney Islands Council. The Orkney budget amounts to 5.1% of the overall project costs and 6.91% of the EU grant allocation and the 100% allocation to the Council means that the original position of no net cost to the Council remains the case.

10.2.

On the basis that the Council is content with the proposed changes to this project and its role therein, it would be appropriate to establish a project budget for this purpose.

10.3.

The cost and budget allocation is revenue in nature. It is anticipated that any downstream capital costs for the vessel or shore infrastructure will be met by the Scottish Government and, for Orkney, discussion with respect to capital costs may well be incorporated into the wider ferry ownership and funding considerations and particularly if Orkney Islands Council is offered ownership of the new hydrogen ferry at some stage in future.

11. Legal Aspects

If financial assistance is to be provided to the Council by the EU, the Council will require to adhere to the funding conditions associated with such assistance.

12. Contact Officers

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