

Email Transport Scotland to Ministers – 22 February 2017

**From:** [redacted]

**Sent:** 22 February 2017 17:22

**To:** Cabinet Secretary for Economy, Jobs and Fair Work; Cabinet Secretary for Finance and the Constitution; Minister for Transport and the Islands

**Cc:** Cabinet Secretary for the Rural Economy and Connectivity; DG Economy; DG Finance Mailbox; Brannen R (Roy); PS/Transport Scotland; Director of Financial Management; Transport Scotland Directors; [redacted] Rollison R (Richard); [redacted] Press Transport Scotland; [redacted] Lloyd E (Elizabeth); McFarlane J (John); Higgins K (Kate)

**Subject:** Ferguson Marine Engineering Limited - Shipbuilding Contract - Two 100 Metres Dual Fuel Ferries

Cabinet Secretary for Economy, Jobs and Fair Work  
Cabinet Secretary for Finance and the Constitution  
Minister for Transport and the Islands

I attach a 9 page submission in relation to Ferguson Marine Engineering Limited - Shipbuilding Contract - Two 100 Metres Dual Fuel Ferries.

The submission will be helpful background to the planned meeting between Mr Jim McColl, Clyde Blowers Capital, the owners of FMEL, and the Cabinet Secretary for Economy, Jobs and Fair Work and the Cabinet Secretary for Finance and the Constitution on Thursday 2 March 2017.

Thanks

[redacted]  
AMFC  
Transport Scotland  
22 February 2017

[redacted]  
Ferries Unit  
22 February 2017

**Cabinet Secretary for Economy, Jobs and Fair Work  
Cabinet Secretary for Finance and the Constitution  
Minister for Transport and the Islands**

**FERGUSON MARINE ENGINEERING LIMITED - SHIPBUILDING CONTRACT TWO  
100 METRES DUAL FUEL FERRIES**

**Purpose**

1. To provide Ministers with an update in relation to progress on the two Dual Fuel Ferries that are currently under construction at the Ferguson Marine Engineering Ltd (FMEL) shipyard in Port Glasgow. To highlight Caledonian Maritime Assets Ltd's (CMAL)

early concerns in regard to likely slippage in the timescale for delivery of these two vessels.

2. To respond to a recent query from the Cabinet Secretary for Economy, Jobs and Fair Work in relation to [redacted under section 30(b)(i)] and the broader issues for FMEL going forward.

### **Timing**

3. Routine, although the narrative in the submission will be helpful background to the planned meeting between Mr Jim McColl, Clyde Blowers Capital, the owners of FMEL, and the Cabinet Secretary for Economy, Jobs and Fair Work and the Cabinet Secretary for Finance and the Constitution on Thursday 2 March 2017.

### **Background**

4. In November 2015, CMAL placed orders at FMEL for the construction of two 100m Dual Fuel Ferries (LNG and Marine Gas Oil), currently referred to as Vessels 801 and 802.

5. The delivery dates of the vessels at contract signing were;

- Vessel 801 – 25 May 2018 – for subsequent deployment on the Arran service to Brodick.
- Vessel 802 – 26 July 2018 – for subsequent deployment on the Uig Triangle service, serving Tarbert, Harris and Lochmaddy, North Uist service.

6. The value of the core contract is £97m: , £48.5m per vessel. In addition to the FMEL contract costs there are other costs associated with these vessels – design, construction supervision and mobilisation relating to the CMAL supervision team and the secondment of vessel based personnel from CalMac. The total cost Scottish Ministers is forecast at [redacted under section 33(1)(b)]

7. There have been a number of challenges that are recognised throughout CMAL's experience with FMEL and these are outlined in more detail in **Annex A** under the following headings:-

- Quality of Built
- [redacted under section 30(b)(i)]
- Challenges
- [redacted under section 30(b)(i)]
- Delivery prospects in more detail
- Future Progress
- [redacted under section 30(b)(i)]
- [redacted under section 30(b)(i)]

### **Delivery prospects**

8. There is an extremely high probability that the vessels will be delivered later than that indicated above. CMAL's view is that while it is potentially possible to deliver Vessel 801 by August 2018, with the current rate of progress this is most likely going to be missed and as a consequence the timescale for Vessel 802 will also slip considerably.

**Next Steps**

9. CMAL continue to be supportive of FMEL, [redacted under section 30(b)(1)]. It is clearly in all our interests to see FMEL flourish. Clyde Blowers Capital (CBC) are to be commended in their support of FMEL, as they continue to construct these two vessels for CMAL and for the substantial investment in modernising the yard.

10. A meeting has recently been arranged between Mr McColl and the Cabinet Secretary for Finance and the Constitution and the Cabinet Secretary for Economy, Jobs and Fair work on 2 March 2017 where the matters explored in the submission can be discussed. Following the meeting with Ministers it is proposed that a delegation of Economy, Transport and Finance officials could usefully meet with FMEL/CBC to explore [redacted under section 30(b)(1)] in more detail.

11. While, respecting the requirements in their contract with FMEL and protecting the public purse, CMAL have indicated to FMEL and CBC that [redacted under section 30(b)(1)] but that should be tied to a realistic and detailed plan for fabrication, equipment installation, outfitting, commissioning and achieving interim milestones.

**12. Ministers are asked to note this update in relation to;**

- **progress on the construction of the two vessels currently being built at FMEL and CMAL's early concerns in regard to likely slippage in the timescale.**
- **note the latest update in relation to [redacted under section 30(b)(1)] and the broader issues for FMEL going forward.**

[redacted]  
 Ferries Unit  
 22 February 2017

Copy List:	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for the Rural Economy and Connectivity			x		x

DG Economy  
DG Finance  
Roy Brannen, CE TS  
PS Transport Scotland  
Gordon Wales, Director of Financial Management  
TS Directors  
[redacted]  
Richard Rollison, Innovation, Industries and Investment  
[redacted]  
Press Transport Scotland  
[redacted]  
Liz Lloyd, Special Adviser  
John McFarlane, Special Adviser  
Kate Higgins, Special Adviser

## Annex A

### **FERGUSON MARINE ENGINEERING LIMITED - SHIPBUILDING CONTRACT TWO 100 METRES DUAL FUEL FERRIES**

#### **Quality of Build**

1. It should be noted that the quality of the workmanship that CMAL has witnessed at FMEL to date is very good. This is seen as a significant positive indication, particularly for the subsequent reliability and longevity of the vessels.

2. The Minister for Transport and the Islands visited CMAL's offices on 12 December 2016 to hear more of CMAL's work in relation to vessels, piers and harbours. Following a briefing on the construction of the two vessels by CMAL senior personnel, highlighting a number of the messages in this submission, the Minister, TS officials and CMAL senior personnel, visited and toured FMEL's yard. We understand the Minister was reassured by FMEL's commitment to the two vessels and was impressed by the parallel work on the reconstruction and modernisation of the shipyard.

[redacted under section 30(b)(i)]

3. [redacted under section 30(b)(i)]

4. [redacted under section 30(b)(i)]

5. [redacted under section 30(b)(i)]

6. [redacted under section 30(b)(i)]

#### **Challenges**

7. There have been a number of challenges that are recognised throughout CMAL's experience with FMEL as outlined below.

- The ship yard has a new owner as it was effectively in administration prior to Clyde Blowers Capital (CBC) stepping in.
- Whilst CBC are well versed in the manufacturing environment the ship building business was not known to them previously.
- The ship yard has a new management team and Board of Directors.
- There has been significant investment in the yard in terms of new build facilities, machinery, processes and IT of circa £25 million.
- There have been delays in vessel construction as various areas of the yard have been in refit and therefore unable to be fully utilised for ship building.
- [redacted under section 30(b)(i)] and planning has proved a difficulty for the yard.
- Fifteen months into the contract: FMEL has yet to issue a detailed plan for fabrication, equipment installation, outfitting and commissioning.

8. The net result of the above is that the original schedule envisaged has “slipped”, as indicated below:-

- Milestone No.9 for 75% fabrication of Vessel 801 is not be expected to be achieved for another 2 months; 4 months later than originally scheduled.
- the same milestone for Vessel 802 is not be expected to be achieved for another 4 to 5 months; 6 to 7 months later than originally scheduled.

9. It is considered unlikely, if not impossible, for the delays incurred to date to be recovered. Going forward, it is considered likely that further delays will be incurred by FMEL, given the recent and current rate of progress and the complexity of the vessels. The current hull construction phase is considered to be a relatively easy task compared to the “outfitting” phase which is yet to come.

[redacted under section 30(b)(i)]

10. [redacted under section 30(b)(i)] That means that the “best case” scenario that CMAL can foresee is as follows:-

- the delivery of Vessel 801 will be in August 2018 (compared to 25 May 2018 envisaged at contract signing), and
- the delivery of Vessel 802 will be in October 2018 (compared to 26 July 2018 envisaged at contract signing).

### **Delivery prospects**

11. There is an extremely high probability that the vessels will be delivered later than that indicated above in the “best case” scenario at paragraph 10 above.

12. CMAL’s view is that while it is potentially possible to deliver 801 by August 2018, with the current rate of progress this is most likely going to be missed.

13. Vessel 802 is a different matter as CMAL cannot foresee a delivery gap of only 2 months between Vessel 801 and Vessel 802, given the physical constraints that currently exist at FMEL. In CMAL's judgement there will be at least a 6 month gap between the delivery of the two vessels, so Vessel 802 could potentially be delayed until February 2019 or thereabouts

14. While the narrative at paragraph 10 above represents the "best case" scenario, the "more likely case" scenario that CMAL can foresee is set out below. It should be noted that CMAL consider it is not unrealistic for FMEL to slip further on the "more likely case" scenario set out below:-

- the delivery of Vessel 801 in late autumn 2018 to early winter 2018/19 (compared to 25 May 2018 envisaged at contract signing), and
- the delivery of Vessel 802 in early 2019 (compared to 26 July 2018 envisaged at contract signing).

15. This information on recent, and anticipated, slippage on the delivery timescales for these two vessels is not in the public domain. For the moment, we are using the line "*delivery of these first of the vessels is anticipated in the second half of 2018 with the second vessel following a few months later*".

### **Future Progress**

16. [redacted under section 30(b)(i)]

17. CMAL will continue to have further meetings with FMEL, to look closely at the planning and address any issues that are expected to arise. CMAL confirm that they will continue to work closely with FMEL in all respects. The situation in relation to the delivery dates for Vessels 801 and 802 is an evolving one, but CMAL and Transport Scotland officials wish to highlight these concerns at this juncture to Ministers.

18. In the meantime, CMAL stand ready to provide any further immediate information to Transport Scotland and Scottish Ministers. Transport Scotland regularly discuss this important issue at CMAL Board meetings and in the monthly TS / CMAL Liaison Meetings. The most recent of these was on Thursday 16 February.

19. CalMac Ferries senior officials and Board members are also being kept fully informed by CMAL given the implications for CalMac in terms of vessel mobilisation, crew training, vessel deployment and service timetables for the Clyde and Hebrides ferry services.

20. Transport Scotland officials are also monitoring progress with a particular emphasis on financial planning and profiling and the interactions with associated planned pier and harbour infrastructure works for the Arran service and on the Uig Triangle. Transport Scotland officials will liaise closely with CMAL on this matter.

21. [redacted under section 30(b)(i)]

[redacted under section 30(b)(i)]

22. [redacted under section 30(b)(i)]
23. [redacted under section 30(b)(i)]
24. [redacted under section 30(b)(i)]
25. [redacted under section 30(b)(i)]
26. [redacted under section 30(b)(i)]
27. [redacted under section 30(b)(i)] However, from the vessel purchaser's perspective (in this instance CMAL), [redacted under section 30(b)(i)]
28. [redacted under section 30(b)(i)]
29. [redacted under section 30(b)(i)]
30. [redacted under section 30(b)(i)]
31. [redacted under section 30(b)(i)]
32. [redacted under section 30(b)(i)]

### **Broader Issues for FMEL**

33. The global ship building market is very weak. Worldwide, new build orders in 2016 are only at a level of 5% of the equivalent position in 2006. Shipyards are closing all over the globe due to lack of orders. Those shipyards that remain are aggressively chasing what little work remains – both in terms of the low prices being offered to buyers and acceding to the buyers' demands in relation to the terms and conditions associated with the contracts. It is undoubtedly a very competitive and difficult market place.

34. [redacted under section 30(b)(i)]

Email Transport Scotland to Ministers – 1 March 2017

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**From:** [redacted]

**Sent:** 01 March 2017 12:27

**To:** Minister for Transport and the Islands; Cabinet Secretary for Economy, Jobs and Fair Work; Cabinet Secretary for Finance and the Constitution

**Cc:** Cabinet Secretary for the Rural Economy and Connectivity; DG Economy; DG Finance Mailbox; Brannen R (Roy); PS/Transport Scotland; Director of Financial Management; Transport Scotland Directors;

[redacted] Rollison R (Richard); [redacted] Press Transport Scotland; [redacted] Lloyd E (Elizabeth); McFarlane J (John); Higgins K (Kate)

**Subject:** Jim McColl meeting with Keith Brown and Humza Yousaf 2 March 2018 final

**Importance:** High

[redacted]

I now attach the briefing pack for Thursday's meeting with Jim McColl.

Regards

[redacted]

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**[redacted]**

**Ferries Unit – Aviation, Maritime, Freight & Canals**

Transport Scotland | Area 2F-North | Victoria Quay | Edinburgh | EH6 6QQ

[redacted]

For agency and travel information visit our [website](#)



Transport Scotland, the national transport agency  
*Còmhdaill Alba, buidheann nàiseanta na còmhdaill*

**MINISTERIAL ENGAGEMENT BRIEFING: KEITH BROWN , DEREK MACKAY AND HUMZA YOUSAF**

<i>Engagement Title</i>	Meeting with Jim McColl of Clyde Blowers Capital, owner of Ferguson Marine Engineering Ltd.
<i>Timing</i>	Normal
<i>Organisation/Venue and full address including postcode</i>	Room T04.07 Scottish Parliament

<i>Date and Time of Engagement</i>	Date(s): Thursday 2 March 2017 Time(s): 10:15am – 11:00am
<i>Background/Purpose</i>	Please see outline Agenda and Key issues at <b>Annex A</b> .
<i>Relevance to Core Script</i>	Investment in Transport Infrastructure to support sustainable economic growth.
<i>Greeting Party and specific meeting point on arrival (if event is at a non SG Building)</i>	N/A
<i>Specific entrance for Ministerial Car/parking arrangements</i>	None
<i>Venue contact Number</i>	Switchboard on 0800 092 7500 or 0131 348 5000
<i>Special Dress Requirements</i>	Suit
<i>Event Programme</i>	<b>Annex A</b> Key issues and attendees.
<i>Key Points</i>	<b>Annex B</b>
<i>Guest List or Meeting Attendees</i>	Included in <b>Annex A</b>
<i>Background</i>	<b>Annex C</b> Submission relating to the Shipbuilding contract – 2x100m dual fuel Ferries dated 22 February 2017  <b>Annex D</b> [redacted under section 30(b)(i)]  <b>Annex E</b> Update on the Hydrogen Ferry - Hyseas III project dated 27 February 2017.
<i>Supplementary Info:</i>	N/A
<i>Directions including map(s)</i>	N/A

<p><i>Media Handling</i></p> <p><i>Official Support</i></p>	<p>Non Media Event</p> <p>Officials</p> <p><b>Names:</b></p> <p>[redacted] Financial Services and SME [redacted]</p> <p>John Nicholls [redacted]</p>
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<b>Copy List:</b>	For Action	For Comments	For Information		
			Portfolio Interest	Constit Interest	General Awareness
Cabinet Secretary for Rural Economy and Connectivity			X		
DG Economy DG Finance Roy Brannen, CE TS PS Transport Scotland Gordon Wales, Director of Financial Management TS Directors [redacted] Richard Rollison, Innovation, Industries and Investment [redacted] Press Transport Scotland [redacted] Liz Lloyd, Special Adviser					

## **Attendees**

Keith Brown  
Derek Mackay  
Humza Yousaf  
Jim McColl  
John Nicholls - Director - Aviation, Maritime, Freight & Canals  
[redacted]: Financial Services and SME

Mr McColl has suggested the following agenda:-

1. Contract 801/802
  - Contract Status
  - Funding profile
2. Update on Port Glasgow Facility
3. Future operating model for Scottish Ferry market **[We are not clear what Mr McColl will raise under this topic]** Scottish Ministers position is clearly stated in the Ferries Plan 2012-2024. In addition, a policy review into future tendering for Scottish Government ferry contracts has been launched.
4. AOB

## **Key issues**

1. [redacted under section 30(b)(i)]
2. Slippage in the construction of the 2 ferries by FMEL and CMAL's view that delivery dates are likely to be missed.

## **Background to meeting**

The meeting has been set up at Jim McColl's request. We understand this follows up a conversation he had with Keith Brown in the margins of a meeting of the Council of Economic Advisers in January [redacted under section 30(b)(i)]

**Jim McColl OBE**  
**Chairman and CEO of Clyde Blowers Capital**

Jim McColl left school at 16 to take up an engineering apprenticeship with Weir Pumps of Cathcart, Glasgow. After gaining City & Guilds certificates at lower and higher level, he gained a BSc Degree in Technology and Business Studies at Strathclyde University. He returned to Weir Pumps in 1978, studying for the next three years for an MBA. Joined Diamond Power Speciality Ltd in 1981, an engineering company supplying equipment to the power industry worldwide; during his tenure he studied part time for a Master's degree in International Accounting and Finance. Head hunted by Coopers & Lybrand, in 1985 he became a consultant, working with companies in financial difficulties that needed guidance. In 1986 he left Coopers to become a self-employed "company doctor", during which he made money through two successful turnarounds resulting in his purchase of Clyde Blowers PLC; going onto acquiring six of the 7 competitors. Over the past 10 years Clyde Blowers has developed into a truly global portfolio of 83 Companies in 27 different countries, employing 5,000 people around the world, with an annual turnover in excess of £1.4 billion. Ferguson Shipbuilders was bought in 2014 after which was renamed to Ferguson Marine Engineering Ltd. He was appointed Officer of the Order of the British Empire (OBE) in the 2001. Has been awarded two honorary doctorates, by Napier University and Glasgow University.

**ANNEX B**

**Key points**

1. [redacted under section 30(b)(i)]

**2. Progress by FMEL with the construction of 2 new ferries**

- Progress is behind schedule in the construction of two new ferries (see milestones below).
- Mr McColl and senior CBC and FMEL executives have been briefed by CMAL on their concerns around slippage and the implications for delivery dates. So this is not news for him although he has not to date indicated that he agrees with CMAL's assessment.
- . CMAL's forecasts given the rate of progress to date are for:-

- ◇ the delivery of Vessel 801 in late autumn 2018 to early winter 2018/19 (compared to 25 May 2018 envisaged at contract signing), and
- ◇ the delivery of Vessel 802 in early 2019 (compared to 26 July 2018 envisaged at contract signing).
- CMAL are liaising with FMEL regarding the progress of the construction of the vessels and continue to be supportive from both a technical and financial perspective.
- CMAL have indicated to FMEL and CBC that they are willing to assist further with cash-flow provided that is tied to a realistic and detailed plan for fabrication, equipment installation, outfitting, commissioning and achieving interim milestones.

### Milestones

#### **Vessel 1:**

On 9 December 2016, FMEL provided new milestones dates with a revised target date of 19 Feb 2017 for the next milestone (75% Fabrication) for Vessel 1. CMAL estimate with current output; 75% fabrication milestone for Vessel 1 will not be achieved before mid April 2017 (4 months later than originally planned).

Actual fabrication as of 10 Feb 2017 was 58%. This indicates that currently FMEL have planning challenges; not just long term, but also short term (over a 9 week period).

#### **Vessel 2:**

Next fabrication milestone for Vessel 2 is 75% fabrication with a revised target date of 5 May 2017 (5 months later than originally scheduled). CMAL estimate with current output; 75% fabrication milestone for Vessel 2 will not be achieved before mid August 2017 (8 months later than originally planned).

### **3. Other matters**

Mr McColl has very recently (last week) taken a personal interest in the HySeas hydrogen ferry project which is now being led by FMEL. It is therefore possible that he may take the opportunity to mention this. An update is attached (Annex D) which was also copied to both Cabinet Secretaries as part of a submission by [redacted] dated 27 February 2017.

## ANNEX C

**NB This annex is a duplicate of the submission of 22 February and has not been recopied here.**

## ANNEX D

**Briefing for meeting on 2<sup>nd</sup> March - [redacted under section 30(b)(i)]**

### **Potential Options:**

- Indicate as part of the new research underway, SMEs are being contacted to build a detailed understanding of [redacted under section 30(b)(i)] and potential need for public sector intervention. This work is nearing completion with the final report expected to be received by SE next week.
- Happy to offer a roundtable meeting with officials, including Scottish Enterprise (and possibly UK Export Finance), to sit down with the company to review the potential need for future investment, [redacted under section 30(b)(i)], to strengthen the financial position of the company;

### **Background**

1. Both the Deputy First Minister and the Cabinet Secretary for Economy, Jobs and Fair Work wish further consideration to be given to [redacted under section 30(b)(i)] of a more significant scale around strategic sectors for the Scottish economy, for example in more **traditional** industries such as steel, shipbuilding or other forms of large-scale manufacturing. This would specifically target businesses which need to put money/working capital (in range of £10-20m+) 'on hold' [redacted under section 30(b)(i)]

2. It is not clear that there is a strong demand for this type of intervention, and/or that the markets are not already providing appropriate capital. Officials will therefore need to reflect on options for [redacted under section 30(b)(i)] might be administered and delivered effectively and with appropriate due diligence. A programme or scheme to provide [redacted under section 30(b)(i)] will require significant expertise and capacity to deliver.

3. We have made some initial enquires of Scottish Enterprise (SE) and Highlands and Islands Enterprise (HIE) on the issue. HIE indicated that a small number of fabricators have in the past experienced difficulties in securing contracts in the offshore wind sector due to [redacted under section 30(b)(i)], and respective balance sheets were such that they were not able to meet the necessary requirements. HIE's role here has been to encourage the development of partnerships or collaborations to strengthen the

company's position. While price competitiveness is more to the fore now in terms of securing orders, it is possible that scale of resource (and ability to provide such bonds) could be a stumbling block in some instances for bidders who are otherwise price competitive. **However the number of incidents of this being a potential issue remains very low.**

4. Scottish Enterprise are currently looking at this area again following specific stakeholder request, and as part of its on-going research on the SME funding market in general. SE previously looked at this area in 2012, and research was completed. The conclusion of the work at that time was that the private sector was satisfying requirements [redacted under section 30(b)(i)] and there was no need for public sector intervention. SE is currently commissioning another piece of research into this market to understand the updated position. Very few companies are approaching SE about issues related to [redacted under section 30(b)(i)]: there are only two that they are aware of specifically, and both of those ultimately secured private sector solutions.

[redacted under section 30(b)(i)]

5. [redacted under section 30(b)(i)]

[redacted under section 30(b)(i)]

6. [redacted under section 30(b)(i)]

7. [redacted under section 30(b)(i)]

**Directorate for Economic Development - 1 March 2017**

**ANNEX E**

## **HYDROGEN FERRY – UPDATE ON THE “HYSEAS” PROJECT**

### Background

1. Transport Scotland and Scottish Enterprise have been supporting the successive phases of the “HySeas” hydrogen ferry project which has the ambition of developing the world’s first sea-going ro-ro vehicle ferry powered by hydrogen produced using locally generated renewable electricity.
2. The HySeas consortium includes Caledonian Maritime Assets Ltd (CMAL), Ferguson Marine Engineering Ltd (FMEL), St Andrews University, Ballard Power Systems Europe A/S (BPSE) of Denmark and Kongsberg Maritime AS (KM) of Norway. Following discussions we understand that Orkney Islands Council have accepted an invitation to join the consortium as the potential future operator of the vessel. This offers a potentially good fit given Orkney has currently underutilised renewable electricity generating capacity and is already working on projects developing the production, storage and transport of hydrogen.

3. Two phases of the HySeas project, led by CMAL, have been completed:

- “HySeas I” established the general technical viability of the project.
- “HySeas II” looked in much greater detail at what would be required to build and operate a hydrogen ferry, including fuel generation and supply, and produced some high-level capital and operating cost estimates.

#### Current position

4. HySeas II concluded that: *“there is no technical impediment to proceeding with the construction and operation of a renewables-derived hydrogen-powered zero-emissions vehicle and passenger vessel”* but recommended that a half-scale factory-floor “string test” of hydrogen drivetrain is undertaken prior to the decision to construct a full-size vessel.
5. The “HySeas III” project has therefore been initiated, with FMEL in the lead, to secure funding for and undertake the recommended string test and to support the subsequent build of a first zero emission vessel, to be operated as part of an energy systems demonstration project. A number of funding applications have been made to EU and UK sources – so far without success. A further application for EU Horizon 2020 funding was submitted on 24 January 2017. Transport Scotland and OIC have provided supporting letters which have been welcomed by FMEL.

#### Scottish Government interest

6. Scottish Government has a number of potential interests in this project:

- Tackling maritime carbon emissions is challenging. CMAL and FMEL have made some progress with recent vessel designs, including the world’s first battery-hybrid ro-ro ferry and, currently under construction, the UK’s first innovative Dual Fuel - LNG and Marine Gas Oil ferries. However, the HySeas project represents a significant increase in ambition by aiming for a ‘zero emission’ ferry;
- Achieving a “world’s first” would give FMEL and the other partners in the consortium a competitive advantage in what is expected to be an increasing export market for zero/low emission maritime technology;
- More locally, a new ferry construction project will help sustain jobs and skills at FMEL’s Port Glasgow shipyard;
- Hydrogen ferries provide an outlet for island and coastal communities with (current or potential) excess renewable electricity generation;
- The production and supply of hydrogen should boost local economic activity and provide jobs which are not easily exportable.

#### Timelines

7. The initial outcome of the application for Horizon 2020 funding (‘stage 1’) is expected in April and final ‘stage 2’ decisions by late summer for those projects passing stage 1. With additional time for the release of funding, this would mean that the string test would start towards the end of 2017. The string test itself would take just over a year and, assuming moving almost immediately to an 18-month build project in early 2019

– without an intervening ship procurement exercise – a vessel could be ready for deployment in the second half of 2020. This is already an ambitious timescale subject to a number of risks and dependencies (see below).

8. Until recently, the HySeas consortium was not aware of any other hydrogen ferry project at a similar stage of progress. However, the Norwegian Government has recently announced that it is working towards the deployment of such a vessel in 2020.
9. The HySeas consortium have therefore drawn up an alternative timeline based on starting the string test as soon as possible and without waiting for the outcome of the Horizon 2020 funding application. This could see the deployment of the vessel by the end of 2019, based on the consortium's timelines for the string test and vessel design/build.
10. Annex B shows a graphic of the 2 timelines.
11. There are also other workstreams that would need to be at a sufficiently advanced stage to inform a decision to proceed with a vessel build:
  - Renewable electricity generation;
  - Local production, storage and transport of hydrogen;
  - Operational issues including re-fuelling of the vessel, training and resilience;
  - Regulatory approvals.
12. Timelines for these activities are being developed by the consortium.

### Costs

13. There are 3 cost issues:

- i. The string test is estimated to cost around [redacted under section 30(b)(1)] in FY 2017-18. The accelerated timeline would require an alternative source of funding and, in the absence of external funding, this would need to be provided by the consortium. [redacted under section 30(b)(i)]
- ii. Vessel construction will depend on the final design but at this early stage are estimated at between [redacted under section 30(b)(1)] and [redacted under section 30(b)(1)].

This could be funded through Scottish Government capital loans to CMAL (as for CalMac vessels) if provision was made for this in the 2018-19 and 2019-20 budgets (neither timeline creates a funding requirement in 2017-18). Compared to the most recent CMAL 'hybrid' ferry, the additional cost of a hydrogen ferry is estimated at [redacted under section 30(b)(1)]. This would however have to be evaluated against other funding proposals for new Clyde & Hebrides vessels which we are developing with CMAL and CalMac as well as with other capital projects across TS and SG. [redacted under section 30(b)(i)]

[redacted under section 30(b)(1)]

- iii. Operating costs have the potential to be lower but only if the renewable electricity for the production of hydrogen is provided at close to marginal cost. Detailed operating cost estimates would require examination with the future operator and production of a business case.

### Risks

14. The Norwegian project puts HySeas' attempt to gain "first mover" advantage at risk although it is not clear on the basis of the publicly available information how comparable a project this is and how realistic their 2020 target.
15. For Transport Scotland and CMAL, the HySeas project represents an opportunity in terms of opening a new market for FMEL and reducing the shipyard's current and historic reliance on Scottish Government contracts. However there is also the risk that moving quickly into the design and build of a hydrogen ferry will distract management and professional time and focus away from the priority of delivering the 2 new ferries already under construction. These projects are already at risk of slippage, as set out in [redacted] submission of 22 February 2017.
16. [redacted under section 30(b)(i)]
17. [redacted under section 30(b)(i)] The 3<sup>rd</sup> hybrid ferry took FMEL almost 2 years to complete. That was for a vessel that had already been designed and which the yard was familiar with, given the first two hybrid vessels had been built at FMEL under its previous owners.
18. We would also need to establish how advanced and scaleable Orkney's hydrogen production and storage facilities are – this should be more straightforward now the Council are on board. It will need to be established that sufficient renewable electricity can be produced and at a price which makes the hydrogen ferry economically viable.
19. As a "world's first" this project carries inherent risk but the consortium are taking prudent steps to mitigate this:
  - Through the string-test, as mentioned above;
  - By using a proven design, the hybrid ferry, as the basis for the vessel – enabling a more conventional power system to be retrofitted should the hydrogen system fail
  - Considering options (technical and operational) of ensuring that lifeline services are maintained in the event of failure with the vessel or the fuel supply.
20. Whilst the HySeas project has made a strong case for the technical viability of hydrogen as a marine fuel, the commercial case needs further development:
  - the competitiveness of the overall hydrogen fuel production and ferry operation compared to conventional fuels;
  - the export potential of the whole concept (vessel and shoreside infrastructure).

### Next steps

21. The consortium is working on a detailed plan for taking the project to completion covering all the various workstreams outlined above.
22. The Stage 1 results of the Horizon 2020 funding application are due in April. This is the stage at which we expect a decision will be sought on funding and timing of the string test.

### Conclusion

23. The reason that HySeas III is so far advanced is that most of the system components are already at market with only the drivetrain and its application to be proved. Bringing the first hydrogen ro-ro ferry to market will provide the Hyseas consortium with a potential window of opportunity lasting several years during which the market can be exploited and a solid base created for future growth.
24. With growing pressure on emissions from marine transport, FMEL report that interest in mid-sized hydrogen vessels, including inshore fishing boats, is already being expressed not only in Scotland but Norway, Sweden, Denmark (lake transport) and the eastern seaboard of Canada.
25. The advantage of being first-to-market with sea-going hydrogen is difficult to estimate but given the scale of worldwide interest in zero emissions marine transport, demand could exceed capacity for at least decade. In addition, the HySeas consortium will continue to innovate with particular emphasis on expanding the use of hydrogen to larger vessels.

Transport Scotland  
27 February 2017

**Annex B**

Email Transport Scotland to Ministers – 2 March 2017

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**From:** Nicholls J (John) (TRANS)

**Sent:** 02 March 2017 13:18

**To:** [redacted]; Minister for Transport and the Islands; Cabinet Secretary for Economy, Jobs and Fair Work; Cabinet Secretary for Finance and the Constitution

**Cc:** Cabinet Secretary for the Rural Economy and Connectivity; DG Economy; DG Finance Mailbox;

Brannen R (Roy); PS/Transport Scotland; Director of Financial Management; Transport Scotland Directors; [redacted] Rollison R (Richard); [redacted] Press Transport Scotland; [redacted] Lloyd E (Elizabeth); McFarlane J (John); Higgins K (Kate)

**Subject:** RE: Jim McColl meeting with Keith Brown and Humza Yousaf 2 March 2018 final

PS/Ministers (an action for PS/Mr Yousaf below)

This is to record the main points of this morning's meeting insofar as they related to ferries.

Contract 801/802 : contract status

- Mr Yousaf asked about CMAL's assessment that delivery could be 6-7 months late. Mr McColl said he was "astounded" by that assessment and assured Ministers that he had great confidence that the first vessel would be launched on schedule in August this year and delivered in May 2018 as per the contract. He accepted that the 75% fabrication milestone would slip (April 2017) but that FMEL would regain lost time. There was a lot of activity ongoing at the yard which was not visible to CMAL. FMEL had engaged a new project manager and was setting up a "war room" to drive the project, and he expected to be able to provide CMAL with assurance on timescales in a fortnight's time.
- It was noted that the build quality so far was good, and that CMAL and FMEL had established a good working relationship. Noting the novel nature of the build, Mr McColl indicated that he understood that it had sometimes taken CMAL a while to answer technical queries from the yard, and that that may have impacted on current slippages to milestones.
- Mr Brown noted the need to expand the narrative around FMEL in public communications – 350 jobs, shipbuilding renaissance on the Clyde, leading edge technology etc.
- **Action:** Mr Yousaf to meet with CMAL in a fortnight for an update on progress. PS/Mr Yousaf to take forward please.

[redacted under section 33(1)(b)]  
John

[redacted under section 33(1)(b)]

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