Grønt Skipsfartsprogram

«Request for Interest Hydrogen» (RfIH2) by Felleskjøpet Agri SA, org.nr. 911608103, HeidelbergCement Norway AS, org.nr. 980910369 (HeidelbergCement)

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Grønt Skipsfartsprogram

Content

Summary

HeidelbergCement and Felleskjøpet Agri have the ambition to establish a sustainable transport system without emissions of greenhouse gases. The transport system will combine the cargoes of the two companies and cover the geographical area from Rogaland in the west to the inner Oslofjord in the east.

The ship round trip will mainly be gravel bulk cargo for HeidelbergCement from Rogaland to the Oslofjord combined with grain from Felleskjøpet in return, minimizing ballast on the round trips. T**he ship shall have zero emission of greenhouse gases during its operation.**

HeidelbergCement and Felleskjøpet offer **a long-term zero emission fuel contract**, to facilitate the supply of hydrogen to bulk carriers and other ships in South-Norway.

Through a tender process, the companies seek a fuel supplier that can provide the described fuel. This **Request for Interest** is the first step in the tender process to find partners who share the ambitions to develop supply of zero-emission fuels to the required ship.

HeidelbergCement and Felleskjøpet have established a co-operation with the Green Shipping Programme (GSP). The GSP Service Centre for Green Fleet Renewal is committed to facilitating the process until the transport agreement is established. **Public funding** will be sought for both the development project and the financing of the fuel supply.

A parallel tender has been issued in June 2020 to ship operators who will carry the cargo for a contract period of up to 20 years.

It is the companies' ambition that this long-term zero-emission fuel contract will facilitate the developed fuel supplies to pave the way for a **new generation of green, standardized fuels** in the necessary green development of short sea shipping.

1. Background

1.1 Green Focus

An increasing number of transport customers set targets and cast strategies for zero-emission and low-emission transport. Public organisations are reconsidering their purchase policy and weight the environment significantly more. However, the experience so far shows a lack of motivation, desire and competence. The expectation with the prevailing market forces is that the national targets of emission reduction will not be met in time.

Five years of work experience with studies and pilots in the Green Shipping Programme (GSP) shows that an essential aspect of obtaining a swift "green shift" is to make the markets of green technology usage work rapidly. Experience also shows that the time towards a green fleet renewal may be reduced significantly by involving cargo owners (charterers) in the studies and the analyses of cost-efficient and sustainable logistics solutions.

HeidelbergCement and Felleskjøpet Agri aim to produce and deliver their products in the most environmentally friendly and sustainable way possible. Both companies have a strategy which contains the target of bringing sustainable logistics solution into reality.

In the GSP pilot "Transport of Gravel and Grain by Sea" ("Sjøtransport av byggeråstoff og korn") the two companies found that by combining their flow of cargoes, they may enable the goal of making zero-emission sea transportation a reality.

1.2 Felleskjøpet Agri

Felleskjøpet Agri transports grain from the Oslofjord to Western Norway and Mid-Norway and has the ambition to establish climate-neutral transport on these legs. The goal is to reduce greenhouse gas emissions from the company's transport activities by 50 % within 2030. Felleskjøpet shows special attention to the climate and the environment, both when it comes to the company's services, and to operation goods and production solutions they deliver to the agricultural industry. They set requirements to raw materials, suppliers of raw materials and the use of raw materials. The company strives to use more renewable energy continuously, such as biofuel at its factories and mills.

1.3 HeidelbergCement

HeidelbergCement has made an ambitious target in 2030 concerning CO_2 emissions. Within that year the company has stated it will have 30% less CO_2 emissions compared to the 1990 level. For the company's Norwegian-based activities, the target is to have carbon-neutral products within the same year.

The company is responsible for Norcem, NorStone and Norbetong's logistics. NorStone alone represents an annual quantity of 2,5 million tonnes seaborn gravel. From the West Coast to the East Coast of Norway around 500 000 tonnes are carried on board self-discharging dry bulk carriers ranging between 3 500 and 6 000 dwt where the average shipment is 4 000 tonnes.

1.4 The Pilot Project

In the Green Shipping Programme[1] (GSP) pilot project "Transport of gravel and grain by sea" the two cargo owners (charterers) have co-operated to enable a combination of the logistics needs between the Western and Eastern Norway to enable a sustainable transport system with a "zero-emission" ship.

The pilot project was executed in the period 2019-2020, and the owners of the project were the cargo owners mentioned above. Other contributors in the Green Shipping Programme were ABB, Enchandia, Flowchange, Gasnor, Grieg Star, Hordaland Fylkeskommune, Hyon, Kongsberg Maritime, Kystverket, Kystrederiene (Roslagen Shipping and K. Sætre & Sønner), Sjøfartsdirektoratet, SINTEF, Vard and DNV GL (coordinator).

The pilot led to a requirement specification which describes the requirements to a standard transport solution by use of one unique ship with zero-emission in operation, and a requirement specification for hydrogen to power the same ship.

1.5 Co-operation Going Forward

Felleskjøpet and HeidelbergCement have decided to realize the potential of zero-emission transport as identified in the pilot project. Therefore, in cooperation with the "GSP Service Centre for Green Fleet Renewal"[2], they have decided to search for partners to meet their target – to accomplish a long-term charter party with a ship operator and a long term hydrogen supply contract for a zero-emission cargo vessel. The cargo owners are aiming for long-term contracts of up to 20 years duration.

The project will undergo the following four (five) main phases that will also include fuel supplies:

- Phase 1: Bidding competition, search for ship and hydrogen partners
  - *Phase 1a: «Request for Interest»*
  - *Phase 1b: «Request for Quote»*
- *Phase 2: Develop detailed transport and fuel solution for a zero-emission vessel, «Request for Proposal»*
- *Phase 3: Establish the transport and the fuel contract*
- *Phase 4: Build and deliver ship and fuel solution*
- *(Phase 5: Execute the new transport and fuel contracts for the zero-emission vessel)*

This document is covering phase 1a "Request for Interest for Hydrogen".

1.6 Green Shipping Programme (GSP)

HeidelbergCement and Felleskjøpet have established a co-operation with the GSP. The GSP Service Centre for Green Fleet Renewal is committed to facilitating the process until the transport agreement is established.

1.7 Public Funding Support

Public funding will be sought for both the development project and the financing of the ship and the fuel supply.

[1] https://www.dnvgl.no/maritime/gront-skipsfartsprogram/index.html (Norwegian)
https://www.dnvgl.com/maritime/green-shipping-programme/index.html (English)

[2] https://www.dnvgl.no/maritime/gront-skipsfartsprogram/Flatefornyelse/index.html

At the start of this tender competition, PILOT-E has been identified as a possible support scheme during the development phase, as well as Enova's funding support for investments in the ship and necessary fuel infrastructure.

2. The Tender Process

2.1 Goal

The ultimate goal of the tender process is to realize an up to 20 years transport contract with zero-emission operations combining the cargoes of HeidelbergCement and Felleskjøpet Agri.

In this document HeidelbergCement and Felleskjøpet Agri are together referred to as the "Tenderer" and the hydrogen supplier is referred to as the "Bidder".

2.2 About the Process

The tender process will go through four phases.

Phase 1 is a bidding competition consisting of two steps. The first step, phase 1a, is an open bidding competition. The purpose is to identify hydrogen suppliers with fuel solutions fulfilling the requirements for zero-emission operation.

A few hydrogen suppliers will be selected for the second step, phase 1b, to identify the solution and supplier found to be the best qualified for the assignment of the transport contract. A budget price of the **fuel solution** must be included in the offer document.

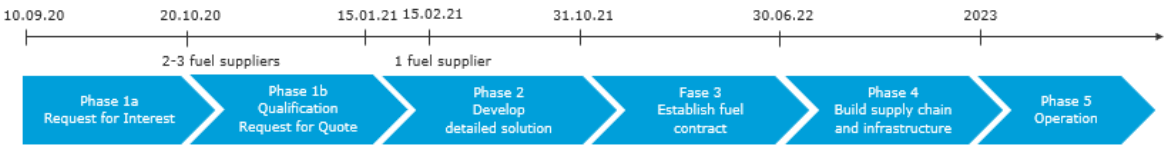
The selected supplier will enter **phase 2** of the tender process, to carry out the development of a detailed description of the fuel solution and the zero-emission fuel, suited for establishing the fuel contract and ordering the zero-emission vessel. This phase will be carried out with the principle of open books, and there will be a process of identifying, and subsequently applying for possible project grants and subsidies. The fuel supplier must work closely with the selected ship owner.

Phase 3 has the purpose of establishing the **fuel contract**, based on the results from phase 2.

Phase 4 has the purpose of order, build and get delivered the zero-emission fuel supply and establish necessary infrastructure in ports for vessel bunkering.

This document is covering phase 1a and is open to all interested hydrogen suppliers.

Tender Process - Implementation Plan for for Fuel & Infrastructure



The schedule for tender process and development project for the fuel supplier is shown above. The timeline for phase 1b and later phases is indicative, and the Tenderers are willing to adjust this in connection with the selection of fuel suppliers for phase 1b.

Following a successful tender process, the new fuel contract with the zero-emission vessel will be implemented (**phase 5**).

2.3 Zero Emissions

The ship(s) is required to have no greenhouse gas (GHG) emissions at sea or in port.

Tendering ship owners has been informed that based on available knowledge to the tenderers, the most likely fuel option is hydrogen, but also other options may be considered, including shore power, sails and wave foils. Pressurized hydrogen, liquified hydrogen, and LOHC (Liquid Organic Hydrogen Carriers) are open options at this stage. Other energy carriers and non-fossil fuels may also be accepted if it does not result in GHG emissions during any operational mode and is likely to be available for use in operation from the start of the service in 2023.

This hydrogen tender is a parallel tender for ship transport. The results of this tender will affect the final ship design, and information regarding this will be shared with sea transport bidder. It is the ambition that the fuel used shall be sustainably sourced and produced and have minimal lifecycle emissions.

Fuel for a zero-emission ship will probably cost more than traditional fuels. Ship operators must, therefore, propose energy-efficient hulls and solutions to minimize fuel use. Optimal sailings speeds, minimal bunkering time and no or small deviations for fuel bunkering, must be considered by bidding ship operators and fuel suppliers.

3. Requirements to the Issue of Interest

The following information is to be included in the Bidder's response to this Request for Interest.

3.1 Confirmation of Interest

The Bidder should confirm his interest to participate in the competition, and also confirm that if selected for further participation in this tender process, his intention is to carry out the necessary development of the solution, enter a fuel contract, order the zero-emission fuel production plants and deliver the fuel to the ship for agreed time frame.

3.2 Elevated Description of the Concept

A brief description of the fuel and the storing and fuelling solution with main technologies must be provided. Possible technology suppliers should be included, but no binding agreements need to be made. It should also include:

- A description of how the fuel production, supply and consumption will be organised and how other parties also can benefit from the fuel supply.
- A concept description of the zero-emission fuel[3] including main technologies for fuel production, fuel storage, fuel handling and fuel conversion to propulsion energy.
- An overview of alternative sub-suppliers.

3.3 Presentation of the Project Organization and Resources

A description of how the Bidder intend to carry out the work through the tender process must be provided, including an outline of the supplier's project organisation.

3.4 Company Information

The bidder must give the following information about the company, and if relevant, main partners to deliver the fuel services in question:

- Certificate of registration (firmaattest)
- Tax certificate (skatteattest)
- The Bidder's economic and financial position (credit rating)
- The Bidder's technical and professional qualifications
- Description of the Bidder's quality assurance system
- Annual accounts for 2017-2019
- Confirmation of compliance with the UN Code of Conduct

3.5 Project References

The Bidder is requested to include references from fuel supply contracts and relevant projects and engagements highlighting the Bidder's ability to carry out the requested project.

3.6 Submission of Documentation of Interest

Documentation of Interest must be submitted to the following address: **HCFK@dnvgl.com.** All documents to be sent in a zipped file.

[3] The project's definition of zero-emission is given in appendix A "Requirements for Hydrogen".

4. Rules for Conducting the Competition

4.1 Language

The Registration for Interest, including all attachments and supporting documentation, must be written in English or Norwegian. A combination of documents in Norwegian and English is accepted.

4.2 Tenderer's Point of Contact

Eivind Dale

Eivind.Dale@dnvgl.com

Tel +47 930 59 822

4.3 Registration for Tender Process

The Bidder should registrate participation by sending a confirmation to the following e-mail:

HCFK@dnvgl.com

By registration, the Bidder will receive information during the period of the competition and invitations to information meetings and arrangements for partner search.

The Bidder shall registrate contact point for his organisation:

- Company Name
- Organisation number
- Name of contact person
- Position
- E-mail address(es)
- Phone number

The Tenderer may, at its absolute discretion, either exclude a Registration for Interest from consideration or seek clarification where the Bidder has failed to comply with the instructions given.

4.4 Questions & Answers related to the Tender Documents

The Bidder must direct all questions regarding this Request for Interest to the following e-mail:

HCFK@dnvgl.com

The questions will be anonymized and answered and made available to all Bidders that have registered according to Chapter 4.3. The Bidder will be informed about new questions and answers by e-mail registered in Chapter 4.23.

4.5 Cost and Risk

The Bidder's participation in any stage of the tender process, or in relation to any matter concerning the process, is at the Bidder's sole risk, cost and expense. The Tenderer shall not be responsible for any costs or expenses incurred by any Bidder in preparation or submission of a Proposal or taking part in the tender process.

4.6 The RfIH2 Process and the Timeline of Events

Table 1: Key Request for Interest events

Request for Interest (RfI) process	Date	Comments
RfI public announcement for ship operation	10.09.2020	The project and the RfI was announced on a press conference at Felleskjøpet Agri's premises at Kambo in Moss
RfI for ship operation release	03.07.2020	Has been issued.
RfIH2 release	10.09.2020	
Information Meeting incl. Q&A	TBD	A web seminar where the Ship and Hydrogen Tenderer will give information, candidates ask questions and answers provided
Enquiries closing date	10.10.2020	Deadline for questions
Documentation of Interest closing date	20.10.2020	Deadline for delivering Issue of Interest as described in chapter 3

4.7 Matters Concerning Interest Response

All Issue of Interests will be treated confidentially.

4.8 Conflict of Interest.

The Bidder must not place her-/himself in a position that may or does give rise to an actual, potential or perceived conflict of interest between the interests of the Tenderer and the Bidder's interests during the RfIH2 process.

If a conflict of interest arises during the RfIH2 Process, or appears likely to arise, the Bidder must immediately advise the Tenderer through the Contact Point given i chapter 4.2.

5. Selection Process

The main activities of the RfIH2 Process after closing date for documentation of interest are described in this chapter.

5.1 Proposal Presentation

After the RfIH2 closing date the Tenderer may require the Bidder to provide a presentation. The invitation will be sent out in reasonable time before the event.

5.2 Evaluation of the Documentation of Interest

The submitted documentation of interests will be evaluated on the following basis:

- Criteria #1 Description of the fuel solution (40%)

- Criteria #2 Description of the project organisation (20%)
- Criteria #3 Description of the Bidder's organisation and his capability and capacities to deliver the requested transport solution (40%)

5.3 Debriefing of Bidders

When the Selection Process is ended the Tenderer will not be conducting any de-briefings for any unsuccessful Bidders.

By submitting the registration for Interest, the Bidder has agreed that the Tenderer is not required to conduct a de-briefing and will not be required to provide any reasons for not doing so.

Appendix A: Requirements for Hydrogen

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For RfIH2. Version: 2020-09-10

Content

1. Introduction

This document gives a description of the functions and specification required for the supply of hydrogen which shall be delivered under the Fuel Agreement. The requirements described in the following aim to clarify what is expected from the fuel supplier at the end of the tender process.

2. Overview of hydrogen solution

2.1 Type of Hydrogen supply

At this stage, the Tenderer is open for different types of hydrogen, such as pressurized, liquified or in organic fluids (LOHC). Ammonia is also an option to be considered.

The hydrogen can be green (electrolyzes) or blue (reformed natural gas with carbon capture and storage). Grey hydrogen (reformed natural gas without carbon capture or storage) is generally not accepted unless for a short transition period or as a backup fuel.

2.2 Geographical trade area and range

The transport system will combine the cargoes of the two companies and cover the geographical area from Rogaland in the west to the inner Oslofjord in the east. The end location in the Oslofjord is Oslo. The northern-most location in West-Norway is Felleskjøpet Agri in Vaksdal, outside Bergen. The sea distance between these points is 405 nautical miles.

The ships will normally do consecutive round trips between the Oslofjord and West-Norway and they will seldomly trade within the regions, except occasionally with West-Norway.

Deviation trips to other destinations in Southern Norway, Denmark and the North Sea must be expected, occasionally.

2.3 Bunkering port

Ideally bunkering of hydrogen is done in a port while loading or unloading, to avoid deviation and increase time in port. This is, however, not required. If the total cost of power is lower for bunkering in other areas, this will be preferred.

Suppliers are free to propose one or more bunkering points in the trading range. Multiple bunkering points will reduce the need for onboard storage and is therefore preferred if the impact on the hydrogen price is minor.

An overview of regular loading and discharging ports is provided in the following table. Other ports and quays may be used.

Table 1: List of ports.

Location:	Loading/Discharging	Call frequency
Felleskjøpet Agri		
Sandesund (Østfoldkorn SA)	Loading port	High
Kambo, Moss (FKA Kambo)	Loading port	High
Drammen (FKA Drammen)	Loading port	
Holmestrand (FKA Holmestrand)	Loading port	
Larvik (FKA Larvik)	Loading port	
Halden (Østfoldkorn SA)	Loading port	
Kvalaberg (FKRA Kvalaberg)	Port of discharge	High

Stavanger (FKA Stavanger havnesilo)	Port of discharge	
Vaksdal (FKA og Norgesmøllene)	Port of discharge	
HeidelbergCement		
NorStone Askøy	Loading port	
NorStone Jøsenfjorden	Loading port	
NorStone Årdal	Loading port	High
Norsk Stein Jelsa	Loading port	
Norsk Stein Larvik	Loading port	
Norsk Stein Tau	Loading port	High
Norsk Stein Dirdal	Loading port	
Kristiansand	Port of discharge	
Mandal	Port of discharge	
Skien	Port of discharge	

2.4 Range

Ideally the vessels should be able to do full round roundtrips between Boknafjorden and Oslofjorden at one bunkering. The roundtrip distance for this is about 600 nautical miles. The specified endurance is therefore 600 nautical miles at a service speed of 10 knots with 15 % sea margin. This range can be extended by slow speeding and use of shipboard batteries to store extra energy. The range is subject to final negotiations with the ship operator.

2.5 Supply chain

The hydrogen supplier is expected to handle all processes until the delivery of the fuel to the ship, marked in green in chart below. Shipboard processes (blue) may be included in proposals.

Figure 1: Hydrogen supply process

2.6 Total Cost of Energy

The cost of storage and consumption on board the ship will be part of the total cost of energy that will be considered in the evaluation of proposed alternatives, in addition to the cost of fuel delivered to the ship.

The cost of ship deviation and lost ship time for bunkering is important for the ship operator and will therefore be evaluated. A ship cost of about kr 2500/hour may be used to calculate time lost for the ship. 6 kgH2/ nautical mile can be used to calculate deviation fuel costs.

2.7 Fuel need and bunkering frequency

The following bunker need is based on representative estimates for the power need. The below number will be adjusted in the next tendering phase based on proposed ships and routes from the ship operators.

The estimated hydrogen need is about 0,8-1,0 ton/day depending on the final solution chosen. A typical roundtrip between Oslofjorden and West-Norway takes 5-6 days, of which 2,5 days is spent in port. The rest is spent at sea depending on the distances and the weather. The consumption in port is 0-0,3 kgH2/day depending upon the availability of shore power and the use of the ships loading gear.

The expected energy need is 1,0 MW at sea at a service speed of 10 knots. At a fuel consumption of 60 kgH2/MWh this is equivalent to 60 kgH2/hour or 6 kgH2 per nautical mile or 1440 kgH2/day at sea.

The total bunker need per roundtrip is 4,0-5,5 tons depending on the distance, the weather, the speed, the charging of ship batteries in port and the H2 need in the port. Slow steaming and ship-based batteries charged with shore power may be used to minimize the necessary bunker volume per round trip and thus reduce the need for storage in port and in the ship. Such storage costs can be considerable and two bunkerings per roundtrip may be considered.

3. Hydrogen Fuel Agreement

The type of agreement between charterer (cargo owners) (or the ship operator) and the fuel provider is not decided at this stage and will be subject to discussion in phase 3 of the tender process (settlement of fuel supply agreement). However, the cargo owners are ready to enter into an long-term agreement for the fuel supply, if the offered terms are favourable.

4. Requirements for Fuel Handling

The ship must be able to bunker with a minimal loss of time and deviation. Bunkering while loading and unloading is preferred if this operation is safe with minimal risk.

At this moment there is no specific requirements for bunkering time or pressure on the ship in case of pressurized hydrogen. The Tenderer is open for suggestions.

5. Ship design

5.1 General

Regarding port operations and stay, it is required that the ship can be connected to shore power to receive external energy (electricity) for port operation and possible charging of batteries. Shore power shall always be used when available at the quayside.

5.2 Operational Profile

The following requirements to the operation of the ship applies:

- Operational speed of 9-10 knots
- Port time: 12-48 hours per port call depending on cargo volumes, cargo handling and weather. Port times are normally longer for the grain transport from Oslofjorden to West-Norway.
- Voyages offshore – the North Sea and Skagerrak may occur within the restrictions of the specified range.
- Indicatively capacity of minimum 500 nautical miles incl. port operation in normal operation and weather conditions.
- Bunkering in port from tanks in ports, from trucks or from bunkering barges is feasible.
- The table below shows the specifications for the vessel that need to be satisfied.

Table 1: Ship Specifications.

Main Details	
Ship type	Dry bulk carrier – "self-discharger"
Deadweight (dwt):	About 5 000 tonnes
Service speed	9-10 knots
Minimum volume of cargo hold (m^3):	Minimum 6 000 m3
Cargo gear	Electric excavator
Hatches	Water/weather tight and "weather cover"
Bulkheads	Movable bulkheads for cargo separation
Shore power capability:	Yes

5.3 Emission Requirements

The ship shall have zero emission of greenhouse gases during its operation. This applies to all normal operating modes.

6. Reporting Requirements

A reporting system will be established related to the fuel which the supplier is obliged to deliver. The ship operator will report performance, including energy consumption, to optimize fuel supplies throughout the supply chain.