

Project Management Plan

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R	Document, Report, Drawings	X
DEM	Demonstrator, pilot, prototype	
DEC	Websites, patent fillings, videos, etc.	
OTHER		
ETHICS	Ethics requirements	
ORDP	Open Research Data Pilot	

Dissemination Level		
PU	Public	X
SEN	Sensitive information. Confidential, only for Members of the Consortium (including the EU Commission Services)	
EU	EU classified information. Submitted according to special procedures agreed with the Granting Authority	

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GLOSSARY, ABBREVIATIONS AND ACRONYMS

EU	The European Commission or in general Europe
CINEA	European Climate, Infrastructure and Environment Executive Agency
PO	Project Officer assigned by CINEA to sHYpS Project
Partner	Company member of the sHYpS Project Consortium
Project	The sHYpS no. 101056940 Project
sHYpS	Sustainable hydrogen powered shipping
GA	Grant Agreement
CA	Consortium Agreement
PMS	Project Management System
PM	Project Management
TM	Team Management
PA	Project Administration
P&C	Planning and Controls
PR	Project Reporting
DC	Document Control
HSEQ	Health, Safety, Environment and Quality controls and assurance
PRM	Procurement Management
MM	Materials Management
WP	Work Package
NP	Navalprogetti Srl – Trieste – Italy – The Coordinator – Lead Beneficiary of WP2, 6, 9
VIKH	Viking Hydrogen as – Oslo - Norway – Partner
CHART	VRV srl – Milano – Italy - Partner – Lead beneficiary of WP1
FEROX	Chart Ferox - Partner
CEN	CENERGY Srl – Trieste – Italy - Partner
UNITS	Università degli studi di Trieste – Trieste- Italy - Partner
PLP	Hypulsion – Paris – France - Partner – Lead beneficiary of WP4
JEU	Jeumont Electric sas -Jeumont- France - Partner – Lead beneficiary of WP5
POB	Bergen Havn as – Bergen – Norway - Partner
K17	Kontor 17 MPM GMBH – Hamburg – Germany - Partner – Lead beneficiary of WP7
PNO	PNO INNOVATION – Belgium – Partner – Lead Beneficiary WP8
NEHEM	Nehem BV - Affiliated entity to Ciaotech srl

INNEN	Innovation Engineering srl – Affiliated entity to Ciaotech srl
RICCZ	Ricardo Prague sro – Prague – Czechia - Partner
LLOYDS	Lloyd’s Register EMEA IPS – London – UK – Associated partner
RICUK	Ricardo Consulting Engineers Limited – London – Uk - Associated partner
WP1	Development of LH2 ISO Storage containment
WP2	Fuel gas handling system design and integration
WP3	Fuel cells integrated design and overall energy management
WP4	Logistics & handling design
WP5	Overall electrical design & ship integration
WP6	LH2 Storage ship integration, testing and demonstrator
WP7	Upscale of the solution – Road to 2027 demonstration
WP8	Dissemination, communication and exploitation
WP9	Project Management

1 EXECUTIVE SUMMARY

Scope of this Project Management Plan is to provide a single point of reference for the management process that will govern the sHYpS Project.

The present deliverable defines the Project organization, procedures, roles and responsibilities related to the management activities that will be carried out and describes how the Project will be controlled.

It describes management activities intended to ensure that processes and procedures are defined, and their execution is continuously monitored, corrected if necessary and implemented, based on a common standard.

The document is based on the terms and conditions established in the Grant Agreement no. 101056940 and its Annexes, as well as in the Consortium Agreement.

The use of the present plan can ensure better collaboration among the Consortium Partners, individuals and groups.

The Project Management Plan is the deliverable no. D9.2 of WP9, intended to be used by all Partners, to ensure that Project processes and outputs are monitored and properly reported to prevent possible deviations from the Work Plan in Attachment 1.

Time, budget and quality are the overall objectives and priorities of the Consortium.

PARTNERS



2 FOREWORD

Every project management technique and method can be used, but without appointing a leadership to the project, it is unlikely to get anywhere.

Only if the designed Coordinator become and is acknowledged as a leader and manager of the project, the project may succeed.

As a leader, the Coordinator, together with the PM Team (see 2.6), thanks to the responsibilities it assumed with EU, would have the command authority for guiding the project.

Partners will consider Coordinator and PM Team a trusted and reliable source of information for the Project.

All people governing the Project are expected to be honest, competent, and inspirational. Main job is to motivate the Partners and make sure that everybody is moving in the same direction - towards the project goals and to its completion.

2.1 DEFINITIONS

Project Management System (PMS) is the formalization of the Project Management practice within a set of documents, guidelines, and tools, to provide a formal mechanism for managing and controlling activities on the Project.

Project Management (PM) is a practice required to optimally plan, execute and control the complex and connected activities of the Development process. Its objective is to assure completion of the Project in the specified time, within budget, in accordance with an agreed quality specification.

Project Management focuses on different areas:

- **Team Management (TM)**, including both Project staffing (definition of adequate Project organization and selection of appropriate resources) and Team Management (e.g. team motivation, team building).
- **Project Administration (PA)** including interfaces between Project Team and other Company functions, permits and consents, office administration and action tracking.
- **Project Planning and Control (P&C)**, consisting of processes of planning and scheduling, cost estimates, cost budgeting, progress monitoring and cost control.
- **Project Reporting (PR)**, describing the processes required to collect and analyze data and to produce and deliver reports on the status of the Project.
- **Document and Data Management (DC)**, dealing with processes of planning, managing, controlling, and filing of Project data and documentation and management of approval cycles.
- **HSEQ management (HSEQ)**, meaning the processes required to ensure that Project will satisfy HSEQ needs.
- **Procurement Management**, describing the processes required to acquire goods and services from outside the company. It includes procurement strategy, source selection and contracts administration.
- **Materials Management**, dealing with the processes required to ensure that the necessary materials are delivered to the right place, at the right time and are maintained damage free and in a suitable condition of preservation.

2.2 REGULATORY FRAMEWORK

sHYpS Project execution shall comply with and governed by:

- Grant Agreement signed by the Coordinator with the European Commission-CINEA and by all the Partners in the Accession Forms. Grant Agreement number 101056940 entering into force on June 1st, 2022
- Consortium Agreement signed between all Partners dated 2022.08.02.
- National legislation frameworks, governing business administration, in the homeland of each Partner
- National legislation frameworks, governing HSE and social issues, in the homeland of each Partner

In case of conflict between the contents of Grant and Consortium Agreements, the Grant Agreement statements shall prevail.

Project Management starts on month 1 (**First of June 2022**) and ends on month 48 (**End of May 2026**).

The 48 months assigned to the Project are considered sufficient for the performance of the foreseen tasks.

2.3 PROJECT MANAGEMENT TASKS

The aim is to manage and administrate efficiently all internal and external affairs. An adequate management structure is necessary to coordinate the work carried out in the project, manage the quality control, the financial and thematic reporting as well as to organize communication among project partners, the associated members and the stakeholders in general.

Specific objectives are:

- Manage the communication in the Project Consortium and Decision Board
- Give overall project governance and provide for quality management ensuring the timely achievement of the project goals as outlined in the work plan.
- Be the central point of contact to the project and interface with the European Commission and other partners.
- Ensure coherence with all legal and EC requirements, rules and regulations and supervise fulfilment of Consortium Agreement, including financial and legal management.
- To coordinate the work in accordance with the objectives of the project and to ensure that all project activities are carried out and deadlines met the satisfaction of the project work plan and the European Commission.
- To manage the individual work package activities ensuring adherence to the work-plan and to ensure the achievement of all project deliverables and milestones.

Description of work:

- Task 9.1 – Consortium and project administrative management, Task Lead [NAV], Involved partners [ALL], Duration [M1-M48]
- Task 9.2 – Monitoring technical developments and work plan, Task Lead [NAV], Involved partners [ALL], Duration [M1-M48]
- Task 9.3 – Quality Management, Task Lead [NAV], Involved partners [ALL], Duration [M1-M48]
- Task 9.4 - Data Management Plan, Task Lead [UNITS], Involved partners [NAV, PNO], Duration [M1-M48]

The Management & Coordination Work Package (WP9) will be carried out under the responsibility of the Coordinator NP.

2.4 CONSORTIUM GOVERNANCE BODIES

The Consortium Governance bodies are:

- the GENERAL ASSEMBLY
- the EXECUTIVE BOARD
- the COORDINATOR

The **GENERAL ASSEMBLY** (all beneficiaries) is the ultimate decision-making body of the Consortium.

Representatives of the following Partners compose General Assembly:

Partner no.	Partner Short Name	Country	Role
1	NP	Italy	Partner – Lead Beneficiary WP2, WP6, WP9 - Coordinator
2	VIKH	Norway	Partner
3	CHART	Italy	Partner – Lead Beneficiary WP1
3.1	FEROX	Czech Republic	Partner
4	CEN	Italy	Partner
5	UNITS	Italy	Partner
6	PLP	France	Partner – Lead Beneficiary WP4
7	JEU	France	Partner – Lead Beneficiary WP5
8	POB	Norway	Partner
9	K17	Germany	Partner – Lead Beneficiary WP7
10	PNO	Italy	Partner – Lead Beneficiary WP8
10.1	NEHEM	Netherland	Partner
10.2	INNEN	Italy	Partner
11	RICCZ	Czech Republic	Partner
12	LLOYDS	UK	Partner
13	RICUK	UK	Partner – Lead Beneficiary WP3

The ordinary General Assembly shall meet at least once a year according with the following agreed calendar:

Project duration

Meeting Calendar			2022												2023												2024												2025											
Nr.	Meeting	Location	WP	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D				
1	Kick off meeting	Brussels/BE	9	■																																														
2	General Assembly meeting	on-line	9		■																																													
3	General Assembly meeting	on-line	9														■																																	
4	General Assembly meeting	on-line	9																																															
5	General Assembly meeting	on-line	9																																															

The **EXECUTIVE BOARD** is the supervisory body for the execution of the Project, which shall report and be accountable to the General Assembly.

The representatives of Partners sitting in the Executive Board are:

Partner no.	Partner Short Name	Role
1	NP	Partner - Coordinator
2	VIK	Partner
3	CHART	Partner
4	CENERGY	Partner
5	RICARDO	Partner

Executive Board shall meet at least once a year (at least one month before the General Assembly), if possible twice a year, according to the following calendar:

Project duration

Nr.	Meeting	Location	2022		2023					2024					2025					2026																					
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M																
1	Executive board	on-line																																							

Additional Executive Board meetings shall be arranged on Partners request, if necessary, as ruled in the Consortium Agreement and shown here below.

Executive Board is furthermore in charge to address controversies that will possibly arise between the Partners.

The **COORDINATOR** (NP) is the legal entity acting as intermediary between the Partners and the European Commission. The Coordinator shall perform, in addition to its responsibilities as a Partner, the tasks assigned to it as described in the Grant Agreement and in the Consortium Agreement.

Apart the planned meetings of General Assembly and Executive Board each Partner is entitled to call other Partners to attend separate meetings in web/call conferences on specific matters. The Partner that called the meeting will issue a MoM and circulate it to all Partners and to Coordinator.

2.5 GENERAL OPERATIONAL PROCEDURES FOR ALL CONSORTIUM BODIES

REPRESENTATION IN MEETINGS

Any Partner which is a member of a Consortium Body:

- should be present or represented at any meeting;
- may appoint a substitute or a proxy to attend and vote at any meeting;
- shall participate in a cooperative manner in the meetings.

PREPARATION AND ORGANIZATION OF MEETINGS

The chairperson of a Consortium Body shall convene meetings of that Consortium Body.

General Assembly

- *Ordinary meeting*: According with above calendar or at least once a year
- *Extraordinary meeting*: At any time upon written request of the Executive Board or 1/3 of the Partners in the General Assembly

EXECUTIVE BOARD

- Ordinary meeting: According with above calendar
- Extraordinary meeting: At any time upon written request of any Partner member of the Executive Board

NOTICE OF A MEETING

The chairperson of a Consortium Body shall forward written notice of a meeting, to each Partner of the Consortium Body, as soon as possible and no later than the minimum number of days preceding the meeting, as indicated below.

GENERAL ASSEMBLY

- Ordinary meeting: 30 calendar days
- Extraordinary meeting: 15 calendar days

EXECUTIVE BOARD

- Ordinary meeting: 14 calendar days
- Extraordinary meeting: 7 calendar days

SENDING THE AGENDA

The chairperson of a Consortium Body shall prepare and send each Member of that Consortium Body a written agenda no later than the minimum number of days preceding the meeting as here indicated:

- General Assembly: 21 calendar days, 10 calendar days for an extraordinary meeting
- Executive Board: 7 calendar days

ADDING AGENDA ITEMS

Any agenda item requiring a decision by the Partners in a Consortium Body, must be identified as such on the agenda.

Any Partner in a Consortium Body may add an item to the original agenda by written notification to all of the other Partners of that Consortium Body up to the minimum number of days preceding the meeting as indicated:

- General Assembly: 14 calendar days, 7 calendar days for an extraordinary meeting
- Executive Board: 2 calendar days

During a meeting, the Partners of a Consortium Body, present or represented, can unanimously agree to add a new item to the original agenda

Meetings of each Consortium Body may also be held by teleconference or other telecommunication means.

2.6 RELATIONS BETWEEN PARTNERS IN THE PM (WP9)

All Partners are engaged in the Project Management (Work Package 9) with a defined number of persons/month and corresponding assigned budget, as follows:

Partner Number and Short Name	WP9 Effort - Person/month
1 - NAV	25,00
2 – VIKH	10,00
3 – CHART	8,00
3.1– FEROX	4,00

4 – CEN	9,00
5 - UNITS	5,00
6 - PLP	1,50
7 - JEU	1,50
8 – PoB	1,50
9 – K17	1,50
10 – PNO	9,00
10.1 – NEHEM	0,00
10.2 – INNEN	0,00
11 – RICCZ	1,00
12 – LLOYDS	4,00
13 - RICUK	1,00
Total	82,50

The Project Management Team listed in the table here above, will assist the Coordinator in performing the Project Management activities.

Each Partner supply as soon as possible to the Coordinator at shyps@navalprogetti.net an e-mail with the following data for the necessary contacts and exchange of information:

- Name of the person in charge for the Project Management inside the Partner organization
- Phone number
- E-mail address

2.7 COMMUNICATIONS

The efficiency and promptness of communication between the Partners is vital for the Project success. All queries and info from one Partner to another to be processed without undue delay having well in mind the planned due dates of Deliverable and Milestones as per Grant Agreement and Work Plan.

In order to allow the Coordinator to keep informed the Executive Board about the progress and possible problems for the Project, and enable it to intervene and help or ease i.e.: for problem solving, any correspondence exchanged about the sHYpS Project between Partners, **to be copied** to Coordinator and shall be addressed exclusively to shyps@navalprogetti.net.

As far as practicable and if not stated otherwise, **all communications** between Partners will be exchanged **in written** via e-mail.

Project language is English.

Matters of particular importance for the Project, even if previously discussed and agreed by phone or in teleconference between a limited number of Partners, shall be confirmed in written via e –mail to **all** Partners.

Information exchanged to be clear, transparent and well timed for the whole community of Partners.

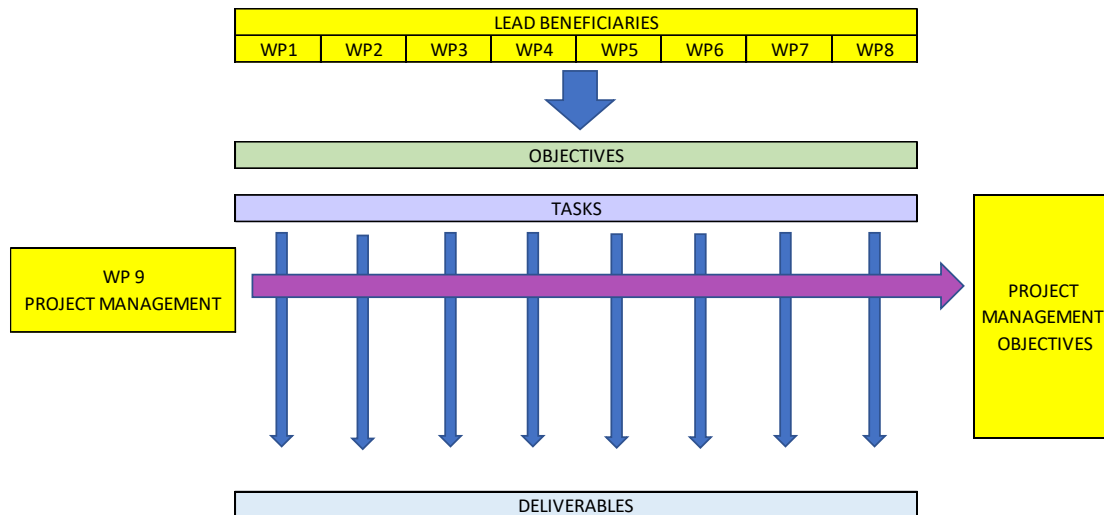
The Object of the communications shall clearly refer to:

101056940 sHYpS – WP no... - Task no... – Deliverable no... – Specific topic object of the communication

3 PROJECT MANAGEMENT OVERVIEW

To reach Project objectives, PM actions will move across the normal activities performed by the Partners, as shown in the figure here below, while Partners go through the relevant Work Packages in order to satisfy the objectives, perform the agreed tasks and issue the relevant deliverables.

It is not in the scope of the PMS to interfere with the normal management process of each Partner.



Partners are free to apply their usual internal management practice for accounting, planning, quality, risk management, HSE, reporting, etc.

The PMS, instead, shall provide to:

- Team building
- Coordination of activities between the Partners
- Level out the outputs of our research programme
- Verify consistency and quality of deliverables and revert to the Lead Beneficiary accordingly
- Monitoring of the overall budget and resources consumption
- Monitoring the general planning and propose remedial actions, to keep the due dates of deliverables and milestones unchanged
- Monitoring the Procurement Management
- Address possible technical issues
- Help Partners, on request, in the correct interpretation of the Grant and Consortium Agreements
- Help and coordinate Partners in the preparation of reporting to European Commission on months 18, 36 and 48
- Request to Partners periodical internal reporting, to be submitted to the Executive Board at every Executive Board meeting (see 2.4)
- Overall Risks management associated to the research Project activities.
- Highlight, during the research, the items of interest and consequently propose for conferences and dissemination.
- Project Ethics

Final scopes of PMS are:

- **Completing the project on time**

- **Completing the project within the assigned budget and with the available resources**
- **Completing the project by achieving the desired level of quality**

4 PROJECT MANAGEMENT ACTIONS

4.1 TEAM BUILDING

Roles and goals for each Partner are already defined in detail in the Grant Agreement and in sHYpS Work Plan – See Attachment 1.

Over Project time, the Team building is intended by PMS to improve performance in a partnership environment. Team building is fundamental for organizational development of Partners' tasks.

Team-building includes:

- Aligning Partners around project goals
- Building effective working relationships between Partners
- Reducing ambiguity in Partners' role
- Finding solutions to Partners' problems

4.2 PROJECT COORDINATION

Project coordination generally refers to planning and managing multiple tasks simultaneously in the Project.

Coordination is essential for sHYpS Project that deals with a number of Partners with related objectives, tasks and deliverables, clearly detailed in the Grant Agreement.

In point 2.4 is reported the division of responsibilities between Consortium Governance Bodies.

In addition, all Partners, by signing the Grant and Consortium Agreement, have recognized to the Coordinator the authority and skill to achieve the Project objectives.

According with the above, the Coordinator expects from the Partners a sound commitment and spirit of cooperation, loyalty and transparency each other, as proven up to now, to realize the necessary synergies for the success of the Project. PM coordination activity will proceed on this path during its monitoring actions.

Expediting is another important aspect of the Coordination activity. It will be performed by the PM, that will monitor, examine the progress of research activities, verify the correct interface and get in touch with the Partners proposing and agreeing remedial actions when needed.

4.3 LEVEL-OUT OUTPUTS

As far as practicable, all Deliverables shall be levelled-out according with a common standard suitable for the sHYpS Project and in line with other EU granted projects.

In the Deliverable D9.3 Quality Management Plan a number of standard forms will be made available to Partners for the documents having EU and Project web site as final destinations, i.e.:

- Documents numbering procedure
- Standard EU form for time sheets
- Deliverables front page
- Etc.

4.4 CONSISTENCY AND QUALITY OF DELIVERABLES

Each Lead Beneficiary is responsible for performing its activities among the following constrains:

- Completing the project/tasks on time, as planned
- Completing the project/tasks within the specified budget and with the available resources
- Completing the project/tasks by achieving the desired quality

PM will verify that Consistency and Quality of Deliverables characteristics are ensuring that it is “**fit for the purpose**”.

To measure consistency and quality of a deliverable, first of all it will be checked that each Partner - consulting a Deliverable prepared by another Partner - has to find in it, clearly presented and easy to understand, all the information needed to progress in its own research activity, along the planned duration of each WP.

4.5 DELIVERABLES ISSUING PROCEDURES

Responsible Partner (Lead Beneficiary of each WP) is in charge of the deliverable consistency, quality and timely issuing within the budget.

One month before the deliverable due date (see Grant Agreement), the deliverable will be circulated to all Partners for comments.

Partners to submit comments to Lead Beneficiary **within 2 weeks at the latest**.

Deliverables not commented within the two weeks are considered “**Approved**”.

Responsible Partner will forward final version of deliverable to Coordinator **within 1 week** from Partners comments receipt.

Coordinator will upload the deliverables on EU portal and on sHYpS web site.

4.6 PLANNING AND BUDGET MONITORING

Progress Control

Executive board meetings dates (see 1.4) represent the checkpoints for progress control.

Each Executive Board meeting is considered, in addition to what specifically present in the agreed agenda of meeting, as a “Phase Review” of the Project for monitoring the progress and fairly prepare the Consortium for the official reporting to EU on months 18, 36 and 48.

Status Reports presented by Partners to the Executive Board at least every six months are a fundamental monitoring tool to identify progress and problems.

Partners are encouraged to take Status Reports seriously.

Each Partner shall complete Status updates **one week in advance to each Executive Board meeting date**. Partners Status updates will be gathered and summarized by the PMS.

Partner Status Reports, for each WP of competence, shall briefly contain:

- **Detail of the actions completed in the reporting period**
- **Cumulated progress of budget and resources consumed up to the closing date of the reporting period (see below in the Cost Control section)**

- **Detail of actions foreseen in the next reporting period**
- **Risk assessment and possible mitigation actions**
- **HSE assessment**

A standard form for Status Reports will be part of Project Quality Management Plan (Deliverable D9.3 of WP9).

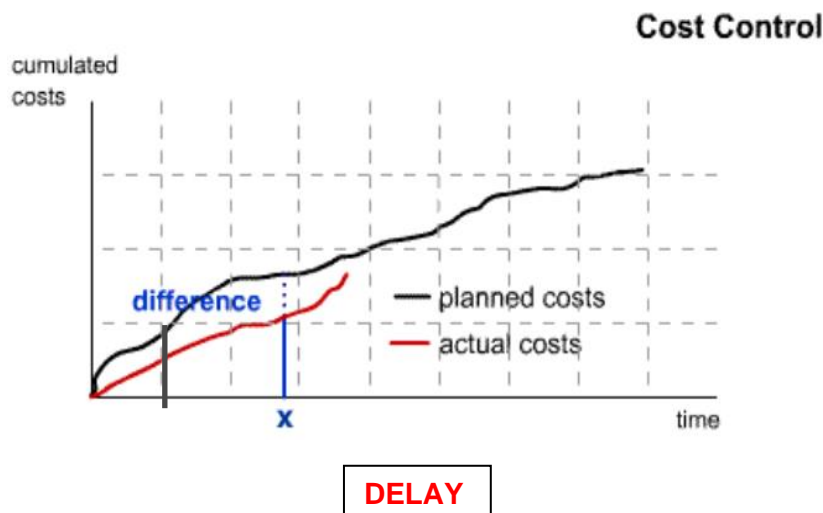
A suggested way to monitor Status is to use two columns in a table and compare the current schedule with the original plan (see Attachment 1 - sHYpS Work Plan, which is integral part of this Project Management Plan) When visualizing it in a chart Partner might get an even more powerful tool to envision the progress of the Project.

Cost Control

To review the project cost it is useful to compare the actual cost to date with the budget plan (see Attachment 1 – sHYpS Work Plan).

Partner might use the cumulated budget plan for the planned costs and compare it to the actual costs to the reporting date.

Always consider the project's progress when doing an evaluation. As in the example below, the actual costs might be a lot less than the planned ones, while at the same time the project's progress might be weeks behind its planned status.



Changes

To grant a fair progress to the Project, no substantial changes are allowed. Objectives, tasks, deliverables, milestones, due dates to EU remain as defined in detail in the Grant Agreement.

Small modifications in internal procedures, Consortium management aspects, technical aspects are acceptable. Partner proposing modifications, with written justifications, shall address them to the Executive Board and Coordinator. Executive board reserves itself the final decision on the proposed change, or otherwise decide to ask by e-mail for the approval of all other Partners, that may accept or reject the proposed change.

The budget granted by EU, globally to the project and to each Partner, cannot be exceeded.

Partners may expect some budget downgrading due to the foreseen EU auditors actions or for inconsistency of their cost reporting to Europe.

Force Majeure

Force Majeure is governed by Section 4 – Article 35 of the Grant Agreement.

4.7 MONITORING THE PROCUREMENT MANAGEMENT

Each Partner perform its procurement actions freely, but in line with EU and national legislation on the matter.

Partners document Coordinator and Executive Board that value of procured goods is “**best for money**”, that quality is as necessary to satisfy Project needs and that delivery time will not affect Project schedule.

4.8 ADDRESSING TECHNICAL ISSUES

Each partner is in charge to address technical issues as it will be necessary and/or discovered during Project progress or requested by another Partner.

Coordinator team remain available anytime to address technical issues if so requested by Partners.

4.9 REPORTING

As already mentioned above in this document there are two aspects of reporting:

- Reporting to EU
- Internal reporting

Reporting to EU, requiring many preparatory works, will be made ready in due time by each Partner. Coordinator team will assist Partners in this activity as far as practicable.

Partners are invited to register costs on a monthly basis, at least.

According to previous experiences, Coordinator suggest Partners to provide internal costs accounting on a weekly basis, for prompt references to events, or not to lose documents/papers for costs justification.

Nearly all articles of the Grant Agreement, at the end of each section, foresee a paragraph named “Consequences of non-compliance”. Partners are invited to monitor carefully this warning not to fall in non-compliances.

For internal reporting see 4.6 Planning and Budget Monitoring.

4.10 RISK MANAGEMENT

Risk management is the identification, assessment, and prioritization of risks.

Risks are defined as the effect of uncertainty on objectives.

Risks are followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events.

Risk management’s objective is to assure uncertainty does not affect the endeavor from the Project goals.

For the time being, Risks identified are:

Critical risks & risk management strategy			
Grant Preparation (Critical Risks screen) — Enter the info.			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	Technical challenges in onboard liquid connection design and LH2 handling (L=M, S=M)	WP2, WP1	Utilise existing legislation where feasible (e.g. IGF code, IGC code, CE directives). Maintain constant contact with Class (Classification Society)
2	Non availability of ready to use equipment and components suitable for LH2 (L=M, S=M)	WP2, WP6	Today some components for LH2 in automotive industry are available, therefore it is expected that, with the required technological upgrades, these can be certified for maritime use. Moreover, a significant improvement in the H2 exploitation and handling is expected also in the light of strong funding support of the “Next Generation EU” program in the field of Hydrogen utilization.
3	Delay propagation from technical work packages (L=L, S=M)	WP2, WP6	Work has to be stringently and efficiently managed, planned and monitored. This will be done e.g. through a close follow-up by the coordinator and the review meetings with the work package leaders. The compliance has to be followed up through quality management.
4	Engagement of fuel cell stack supplier take more time than expected and procured parts are supplied late, delaying the start of testing and extending the overall project timescales (L=M, S=M)	WP7, WP6	RIC will engage with fuel cell stack supplier before the start of the H2Cruise project (during feasibility phase) and will continue to get engagement of the supplier during the concept design phase. Commercial negotiation will be done for those long lead parts that can be bought by multi-source suppliers.
5	Volume of FC system is larger than target (L=M, S=M)	WP7, WP6	Design and system engineering consider multiple suppliers for parts) activities supported by 0D/1D analysis to limit number (combination of components and functions) and volume of components
6	Whole system efficiency does not meet targets (> 55% at peak and > 50% at max power) (L=M, S=M)	WP5	Model-based development approach to optimise the BOP for high efficiency. Early supplier engagement
7	Risk that there are component / system / rig issues / failures during testing that result in delays; investigation work; re-work; additional testrig charges (L=M, S=M)	WP5	Modelling/analysis helps to identify potential component issues sooner, part quality is checked before assembly by RIC. Allow timing contingency in test plan and plan for spares (included in budget) to support testing where required
8	Inability to elaborate cost-competitive supply chain for the delivery of hydrogen (L=M, S=M)	WP4	Scenario analysis

9	Lack of LH2 availability (L=M, S=H)	WP4	Map and match vessel routes, ports, and sources of supply to optimize adequacy between offer and demand
10	Lack of approval from national authorities regarding bunkering in port (L=M, S=H)	WP4	Pre-approval Close dialogue with stakeholders
11	BESS selection / safety environment (L=L, S=L)	WP5	Safety BESS internal monitoring system vs LR regulation
12	Simulation input data reliability and availability from external 3rd party systems (L=L, S=L)	WP4, WP5, WP2, WP1, WP7, WP6, WP3	On site survey for documentation retrieval
13	Test results not in line with expectations and calculations (L=M, S=M)	WP6	Tests organized in various phases so that deficiencies discovered during the initial phase will be overcome during the following phases.
14	For Ship XII (mid 2025), the class does not provide the necessary certifications in time for the ISO container on board or evaporator or the powertrain or the fuel cells, piping, control and integration (L=M, S=M)	WP4, WP5, WP2, WP1, WP7, WP6, WP3	Installation of two LH2 tanks and 3MW+3MW powertrains in Ship XIII (beginning 2026)
15	For Ship XII (mid 2025), the yard is not available to integrate on board the system (piping and control and integration of fluid exchanges and electrical system) estimating that the time for such accomplishment is too short (L=M, S=M)	WP4, WP5, WP2, WP1, WP7, WP6, WP3	Installation of two LH2 tanks and 3MW+3MW powertrains in Ship XIII (beginning 2026)
16	Ineffective Communication/ Dissemination (L=L, S=L)	WP8	The risk is prevented presenting a comprehensive plan that has identified the interested stakeholders and it is well-structured with regard to the different purposes, dissemination methods and responsibilities.
17	Exploitation is not adequate (L=M, S=M)	WP8	Identification, assessment and management at an early stage of the project of potential IP protection means (e.g. trademarks, copyright, etc.) and commercialization channel (e.g. license agreement, etc.).

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
18	Gender issue is not considered adequately during the project (L=L, S=M)	WP9	PNO will involve specific experts from NEHEM (part of the PNO group) to run a workshop on gender assessment and will constantly monitor this topic as a specific sub-task in the WP9.
19	Economical and social benefits of the new developed technologies are not clear and this prevents relevant market opportunities (L=M, S=H)	WP7	A specific task has been planned to carry out a study that will allow to predict the impact of the creation of new value streams downstream of the development of technologies. The introduction of a business case from the proposal stage will show the impact on the technological and economic evolution of the European industry by providing good arguments to support market opportunities.
20	Hydrogen tank handling system failure during loading/offloading operations (L=L, S=M)	WP6	Secondary safety system will assure the possibility of tank securing
21	Risk for passengers in case of hydrogen leakage in tank room (L=M, S=H)	WP6	Double safety level in tank room design. Triple wall separation of hydrogen area from passengers area.
22	Risk for personnel operating in the tank room and fuel cell room (L=L, S=H)	WP6	A robust risk assessment process. An adequate training for all the ship's personnel and the various external employees involved in the loading / unloading of the container. Double check level to be verified before manual operations on hydrogen system. Gas, flame and leakage detection system arranged in way of all hydrogen area.
23	Operational risks using hydrogen as fuel (L=L, S=H)	WP6	The fuel system will be designed after a thorough understanding of fuel properties with appropriate engineering controls and the definition of guidelines to enable the safe handling and use. Some hazards can be mitigated by hydrogen's unique properties. For example, hydrogen's high dispersion coefficient allows it to dissipate rapidly. Other hazards will be minimized through operator training and proper system design (purging hydrogen with an inert gas, adequate ventilation that can minimize or eliminate the potential hazard of asphyxiation and explosion, installation of special flame detectors etc...)
24	Collision (L=L, S=M)	WP6	Tanks, TCS and fuel cells will be arranged inside of the hypothetical line defined by the rules positioned at a distance of B/5 from the side shell that had been estimated by the rules to be the maximum damage penetration in case of collision
25	Fire in the surrounding areas (L=L, S=H)	WP6	Passive fire protection A60 on the boundaries of the tank room and fuel cell room in addition to active fire protection system for the ship as per Rules.
26	Tank securing system damage due to the ship motion (L=L, S=M)	WP6	A displacement detection system will be provided for the tank. In case of tank movements detection, the hydrogen system will be automatically closed.

As pointed out in 4.6, each Partner shall submit to the Executive Board in the periodic reports the detail of risks discovered while performing tasks and the mitigation actions proposed, together with the proposal of cancellation of risks in the meantime expired.

5 HSE

Each Lead Beneficiary/Partner is fully responsible and in charge for the respect of the HSE laws, rules and regulations in force in its Country.

Every Partner is committed to improve health, safety and wellbeing of researchers in the workplaces, encouraging researchers' involvement to enable them to better understand the health risks, consequences and control measures associated with the sHYpS Project activities.

Partners to ensure that researchers have right to the Social Security as per national and EU laws.

Partners to provide Environment protection as per national and EU directives, which scopes are summarized in:

- to protect, conserve and enhance the European Union's natural capital
- to turn the Union into a resource-efficient, green, and competitive low-carbon economy
- to safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing

6 PROPOSALS FOR WORKSHOPS AND DISSEMINATION

Aside the foreseen and planned Dissemination and workshop actions in WP8, it could be of interest, on Project completion, a document reporting the cumulated experience in the sHYpS Project Management.

LIST OF ATTACHMENTS

Attachment 1 – sHYpS WorkPlan

Hydrogen powered Shipping

WP6 LH2 STORAGE SHIP INTEGRATION, TESTING AND DEMONSTRATOR		LEAD [NAV]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32																	
16.1	CONTAINER HANDLING SYSTEM DESIGN REVIEW	Lead (NAV)							M7			M11																																							
16.2	LH2 ROOM DESIGN	Lead (NAV)							M7																																										
	DE.1 – LH2 room design																																																		
16.3	TANK CONNECTION SPACE DESIGN	Lead (NAV)							M7																																										
	DE.2 – Tank connection space design																																																		
	M56.1 Design of LH2 room/Tank connection space																																																		
16.4	On-land testing	Lead (C-EN)																																																	
	DE.3 – On-land tests campaign report																																																		
16.5	On-board storage testing and demonstration	Lead (VIRH)																																																	
	DE.4 – On-board tests campaign report																																																		
WP7 UPSCALE OF THE SOLUTION – ROAD TO 2027 DEMONSTRATION		LEAD [K17]																																																	
17.1	FURTHER OPTIMISATION OF STORAGE CAPACITY	Lead (CHART)																																																	
	D7.1 – Upscaling report																																																		
17.2	Logistics option review	Lead (Pub)																																																	
	D7.2 – Logistics study report																																																		
17.3	PRELIMINARY DESIGN OF TWO 2027 DEMONSTRATORS	Lead (K17)																																																	
	D7.3 – 2027 Demonstrator report																																																		
WP8 DISSEMINATION, COMMUNICATION AND EXPLOITATION		LEAD [PNO]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
18.1	Strategic Communication & Dissemination	Lead (PNO)	M1																																																
18.2	Market & business outreach	Lead (PNO)																																																	
18.3	Exploitation strategy and business modelling	Lead (PNO)																																																	
18.4	Linking and exploitation actions	Lead (PNO)																																																	
	DE.1 Innovation eco-system including gender data																																																		
	DE.2 Dissemination and Communication Plan																																																		
	DE.3 IPR and Exploitation set-up																																																		
	DE.4 Preliminary report on dissemination and communication activities																																																		
	DE.5 Technology & Market Outlook report																																																		
	DE.6 IPR and Exploitation plan update including workshop activities																																																		
	DE.7 Second report on dissemination and communication activities																																																		
	DE.8 Final report on dissemination and communication activities including linking activities																																																		
	DE.9 Final Business Models and Exploitation plan																																																		
	M58.1 Engagement strategy ready																																																		
	M58.2 KERs mapping finalised																																																		
	M58.3 Exploitation event organised																																																		
WP9 PROJECT MANAGEMENT		LEAD [NAV]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
19.1	Consortium and project administrative management	Lead (NAV)	M1																																																
	DP.1 – Consortium Agreement document																																																		
	DP.5 – “Web-based Knowledge Management” manual																																																		
19.2	Monitoring technical developments and work plan	Lead (NAV)	M1																																																
	DP.6 – Project final report																																																		
19.3	Quality Management	Lead (NAV)	M1																																																
	DP.2 – Project Management plan																																																		
	DP.3 – Quality management plan																																																		
19.4	Data management plan	Lead (UNITS)	M1																																																
	DP.4 – Data Management plan																																																		

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