



D1.2: Project Quality and Risk Management

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Acronyms and Abbreviations

Acronym/Abbreviation	Meaning
CA	Consortium Agreement
D	Deliverable
DEM	Demonstration
DMP	Data Management Plan
EC	European Commission
AB	External Experts Advisory Board
GA	Grant Agreement
KPI	Key Performance Indicator
MoM	Minutes of Meeting
NDA	Non-Disclosure Agreement
PC	Project Coordinator
PEB	Project Ethics Board
R	Report
SEN	Sensitive
TSC	Technology Steering Committee
TM	Technical Manager
T	Task
TL	Task Leader
WP	Work Package
WPL	Work Package Leader

Disclaimer

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1 - Introduction

The present document is the Deliverable D1.2 “BlueBARGE Project “Quality and Risk Management” in the framework of the WP1, of the BlueBARGE project.

Related task:

- Task 1.3 - “Quality and Risk Management”.

This document provides the detailed procedures that will be utilised by the Consortium for assuring the conformity and the quality of all project deliverables with the respective requirements, allowing the realisation of internal assessment of the project on a 6-month basis. In addition, it covers the procedures for risk assessment, where risk will be constantly assessed and evaluated within the whole project duration.

In this context, the report is divided into two main sections:

- The first section illustrates the project’s quality assurance approach by presenting the internal and external reporting procedures, the deliverables review processes and the project’s performance metrics.
- The second section, the risk management plan is presented with details on the ways in which the project management team identifies, classifies, and responds to risks throughout the whole project duration.

This document complements the Grant Agreement (GA), and the Consortium Agreement (CA), documents, by providing additional details and clarifications. In case of a discrepancy, the above-mentioned documents shall always prevail.

2 – Quality Plan

The quality plan provides the PC, WPLs, and the rest of the project partners with practical directions for monitoring the project's progress and ensuring the quality of its outputs.

2.1 – Project Objectives and KPIs

The project addresses five objectives as described in detail within the GA document and outlined below:

1. Design an optimized power-barge innovative solution by considering different alternatives and configurations of containerized power supply modules, following a modular and scalable, adaptable, and flexible design approach.
2. Develop and demonstrate a scaled-down, benchmark battery power-barge in real-life operational environment, including charging and supplying power both to ships and local grid.
3. Showcase the reduction in GHG and other polluting emissions for all BlueBARGE use cases through relevant KPIs and prove the environmental benefit of the innovative power-barge solution considering a life cycle perspective.
4. Assess the financial viability and commercial attractiveness of the power-barge solution by including all applicable costs and deliver a commercialization plan for its deployment before 2030.
5. Perform detailed safety assessment covering all technical and operational aspects of the power-barge solution and assess regulatory compliance.

Key Performance Indicators (KPIs) have been defined to support high quality project outcomes. These KPIs are used as a means of implementing quality planning in relation to processes, roles and responsibilities that have been described in the previous sections. The KPIs (Ref. Table 1) will be used as an instrument for the internal quality assessment of various project procedures conducted by the Project Coordinator. Any noteworthy issue arising from the quality assessment or quality control implementation will be promptly notified to all relevant partners.

Table 1: Project Key Performance Indicators (KPIs)

KPI	Explanation
KPI-1.1	Verify identified use cases and expand the list, in a total of 6 concrete use cases.
KPI-1.2	Complete at least 5 alternative design cases for power -barge concept.
KPI-1.3	Scalable solution should be able to cover 95% of commercial fleet of container ships and passenger vessels, including cruise ships, of at least 5,000 GT.
KPI-1.4	Achieve at least 3MW discharge power and 35MWh power capacity through the BlueBARGE promoted design.
KPI-2.1	Achieve an at least 500kW discharge power through the BlueBARGE prototype.
KPI-2.2	Achieve an at least 1.5MWh capacity through the BlueBARGE prototype.
KPI-2.3	Cover energy demand of demonstration vessel for at least 1 hour.
KPI-3.1	Showcase emission reduction through at least 10 environmental KPIs.
KPI-3.2	Reduction in GHG and other polluting emissions from vessels in anchorage will be presented in detail for at least two use cases scenarios.
KPI-3.3	Showcase the reduction of noises and vibrations up to 80% during barge service, compared with the actual onboard energy generation.
KPI-4.1	At least 20% net savings from investing in BlueBARGE.

KPI-4.2	At least 10 stakeholders interest on the BlueBARGE concept and design.
KPI-4.3	Limited – or even non– conflict with regulatory framework.
KPI-5.1	Issue NTQ Statement of Maturity for all innovations.
KPI-5.2	Address all identified high-risk areas with at least 1 risk control measure.
KPI-5.3	Approval -in -principle by classification society granted.
KPI-5.4	Operational and safety guidelines reviewed and verified by all relevant industry partners.
Visual identity	Project logo and templates due in M4 of the project start.
Printed material	First version of digital leaflet (300 copies or downloads if digital); updated versions of leaflets. (1800 copies or downloads if digital) and creation of 2 project roll-ups.
Website	Project website (due in M4 with continuous updates) with at least 4000 unique visits by the end of the project.
Social media	Over 300 Twitter followers and 700 followers on LinkedIn Group. All of the social media posts will generate at least 3 useful interactions/ conversations per month with the linked stakeholders.
Media Relations	4 Press Releases and at least 20 news will be published on the website and sent to the media outlets.
Project conferences, outreach & networking	One high -level conferences will be organised by the project (Final Conferences) and 2 workshops with EOPSA association. The project results will be presented in at least 10 international relevant conferences and events; a booth/stand (e.g. rollups + dedicated “corner”) will be set up in at least 3 relevant sector events.
Newsletter	At least 9 e-newsletters will be sent out throughout the project duration.
Video	Over 800 videos views across all platforms in which it will be shown/uploaded.

2.2 – Quality assurance of deliverables

To ensure high quality of deliverables as per the formal requirements established in the Grant Agreement and the Consortium Agreement, a review process is adopted.

Each deliverable shall be subject to review by two (2) reviewers before is submitted to the EC portal. The reviewers should be partners who were not actively involved in the development of the deliverable and are selected by the Scientific-Technical Manager in consultation with the relevant Work Package Leader.

The following steps, as shown in Table 2, shall be followed to ensure a timely submission of the deliverable.

Table 2: Deliverable review procedure

When	Who	Action	Recipient
6 weeks before official submission date	WPL	<u>Assigns</u> the 2 Reviewers for the deliverable and informs the PC and the Reviewers, by email	PC, Reviewers
3 weeks before official submission date	WPL	<u>Submits</u> the 1st draft to the PC and the Reviewers	PC, Reviewers
10 days before official submission date	Reviewers, PC	<u>Submits</u> the reviewed deliverable with their comments back to the WPL	WPL
2 days before official submission date	WPL	Submits the 2nd draft to the PC	PC
1 day before official submission date	PC	Reviews the revised deliverable and if found of high quality, submits it to the EU portal; otherwise, additional review round is initiated and informs for a two-weeks delay	EU portal, WPL

Submission date	PC	Informs the Consortium about the successful submission	ALL partners
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The quality of the deliverables shall be assessed against specific quality criteria to ensure uniformity and consistency in the review process and the reviewers' clear understanding of their task. The criteria, along with the aspects to be investigated, are outlined in Table 3.

Table 3: Quality criteria of deliverables

Quality Criteria	Description
Clarity	The language of the text is clear with proper sentence structure. The text is in English. The text is unambiguous. The terminology, including acronyms, is explained. There are no spelling errors. Any potentially sensitive information is appropriately worded.
Completeness	All aspects of the deliverable, as described in Annex I (Part A) of the GA, are fully addressed.
Accuracy	All information used in the deliverable is supported by the respective references.
Added Value	Each aspect of the deliverable is analyzed in adequate detail.
Relevance	The content is relevant to the scope of the deliverable, The deliverable is relevant to the targeted readers/audience.
Compliance	The text is written in line with the project's deliverable template.

3 – Risk Management Plan

The Consortium identified potential risks that might have an impact on the project's successful implementation during the proposal phase of the project. These risks are tracked and updated throughout the course of the project as part of WP1's quality and risk management process, allowing the consortium to identify and mitigate them as needed.

Risk Management is the identification, assessment, and prioritization of risks to minimize, monitor and control the probability and/or impact of unfortunate events also known as threats. Since not all risks can be eliminated, mitigation strategies and contingency plans can be developed to lessen their impact if they occur.

The responsibility of managing the project risks relies with the PC and STM: identified risks are tackled and alerts are raised in case any of the identified risks increases its priority. All activities related to risk management are monitored by the PC and the STM with the collaboration of WPLs for specific issues concerning any specific WP.

The procedure is based on the terms of Severity (S) and Likelihood (L) of potential identified risk.

Severity (S) indicates how serious the potential risk event is. A numerical value is assigned to the severity, in the range of 1 to 5, with 1 being the lowest impact/effect and 5 being the highest Table 4.

Likelihood (L) indicates how likely is that the cause of risk event will occur. A numerical value is also assigned to the occurrence which ranges from 1 to 5 Table 5.

Table 4: Severity Description

Severity (S)	Description
1	Negligible
2	Minor
3	Moderate
4	Critical
5	Severe

Table 5: Likelihood Description

Likelihood (L)	Description
1	Extremely unlikely
2	Unlikely
3	Possible
4	Reasonably possible
5	Very likely

The risk register is maintained by the PC and is constantly updated as the project evolves. The risk likelihood (probability) and severity (impact) are reflected in the following table:

Table 6: Risk matrix

Severity						
Likelihood		1	2	3	4	5
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Risk Level: Risk is the combination of likelihood of occurrence and severity. Risk level is calculated as follows:

$$\text{Risk level} = \text{Likelihood} \cdot \text{Severity}$$

The higher the risk level, the more justification and mitigation measures are needed to provide evidence and lower the risk to an acceptable level.

Table 7: Risk levels

Risk levels	
High	The level of risk is not acceptable and risk control measures are required to move the risk to the lower levels.
Medium	The level of risks is acceptable, provided that further reduction measures are not practically applicable. Close monitoring is required.
Low	The level of risks is acceptable.

3.1 – Risk tables

Table 6 presents the risks that have been identified already since the proposal phase and the proposed mitigation measures that have been planned. This table will be updated periodically, every time the Scientific-Technical Committee (STC) convenes and results in a decision for updating the risk matrix (the Technical Manager (NTUA) will urge STC to follow this procedure) due to:

- New potential risks have been identified and classified,
- Risks have been realized and their mitigation measures need to be re-assessed,
- The severity or likelihood of an already identified risk have changed (retained or got out of control), so the risk needs to be ranked again.
- Additional mitigation actions need to be determined.

Table 8: Critical risks and mitigation measures (As pf 1st January 2024-Rev.0)

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures	Likelihood (L)	Severity (S)	Risk Level (Risk Level=L· S)
1	Underperforming partner	ALL	All consortium partners are committed to the project. Grace periods are foreseen initially. The flexible project management structure and CA allow a shift of resources to alternative project.	1	3	3
2	Partner leaving the project	ALL	Temporarily disrupt the project, as the consortium features overlapping coverage in critical areas of expertise. The management structure allows inclusion of new partners.	1	3	3
3	Key-person left or is temporarily unavailable	ALL	Key partners are involved with more than one experienced staff member, ensuring an immediate substitution.	3	3	9
4	Shift of availability for partner's assets	WP7	This risk refers directly to the availability of specific CSM vessels. In case both container vessels planned for the demonstration activities are not available, CSM will cover the needs of the demo through another vessel from its large fleet. Probability for such a risk may be medium, because of the uncertainties in maritime industry, but is relatively low since it can be easily addressed.	3	3	9
5	Needed partners' resources are underestimated	ALL	The project management bodies will analyse the following possibilities to ensure that planned work can be completed: (i) re-arranging resources among	2	4	8

			the partners as needed, (ii) committing further internal resources of organizations in project activities (if possible), and (iii) re-planning work on the activities in accordance with previous measures.			
6	Project schedule is partly not appropriate	ALL	The project management will monitor performed work vs. project plan and will perform corrective actions –change of the project plan– if necessary. In crucial cases, the PC will work on the plan adaptation in close cooperation with EC.	1	3	3
7	Project milestones or deliverables are delayed	ALL	In the scope of project management monitoring activities, detailed analysis will be done on both global project and lower (WP/Task) project implementation levels. Thus, it will be ensured that such cases are recognized in early stages, ensuring timely and effective implementation of necessary corrections in the work plan.	3	3	9
8	Low technical quality of deliverables	ALL	Addressed through regular quality review and peer reviews for each deliverable.	1	5	5
9	Customer requirements not properly reflected in realization	WP2 WP3 WP5	Strictly follow the proposed milestone planning and keep the end-users/partners (VPF, CSM, DANAOS, MMS) involved throughout the project.	2	5	10
10	Agreement among partners is difficult to achieve	ALL	Collaboration in the consortium targets consensus among partners on the open issues. However, to avoid long consensus making processes, which might affect the project plan, the management	1	3	3

			procedures for decision making and conflict resolution will be timely applied			
11	Not satisfactory interaction among WP's and tasks	ALL	Synchronization of work among WP's, so that these cases not occur or are timely recognized allowing corrective actions without significant impact on the project.	1	4	4
12	Necessary coordination level is not achieved	ALL	The project coordination will be observed closely. If needed, the management bodies will propose the corrective actions improving overall coordination.	1	3	3
13	IPR related problems	WP1	The Consortium Agreement will establish a legal framework for the project to provide clear regulations for issues within the consortium about the ownership of IP.	1	3	3
14	Inadequate project management	WP1	A complete and systematic project management plan, along with appropriate allocation of work and tasks to project members, minimise this risk.	1	4	4
15	Developed technology is of low efficiency	WP7	Early tests will reveal the level of the representation granularity that is most useful for the tasks at hand, also allowing refinements to the approach followed; partners have demonstrated capability to deliver alternative and more efficient solutions if needed.	2	5	10
16	Too much diversity required in the contacting mating part over multiple applications (barge-vessel types, barge-	WP5 WP7	Analysis of developed solution in previous implementations of partner projects and optionally scale standardized contacting solution with required	2	4	8

	port, barge- grid for supplying and recharging)		supply/charging power or per application (type of vessel-port grid).			
17	Difficulties in validating defined KPIs	WP4	To ensure validation of BlueBARGE KPIs, these will be considered when defining testing specifications and during all evaluation activities.	1	3	3
18	The marine environment and corrosive conditions can adversely affect VRFB components	WP7	The seawater environment could be challenging for VRFB components, but relevant tests will be run before the final deployment to ensure their proper function.	2	3	6
19	Not being able to come up with a modular solution that remains cost effective in the business case	WP3	VPF, DANAOS and CSM have a good knowledge of the market and what is a conform pricing, if it becomes too high, other module and cabinet sizing to be chosen to optimize it.	3	3	9
20	Not being able to provide an interoperable solution suitable for marine applications	WP3	Development in accordance with marine standards overseen by ABS. Proposal for regulatory framework to be reviewed by standardization committee and implemented as such.	2	4	8
21	Grid capacity limitations leading to an increased turnaround time of the vessel	WP5 WP6 WP7	Prove in WP5 the importance of local energy storage and generation to minimize the grid loading while maximizing charging power availability and with that the trade-off of investment in onboard energy generation versus grid capacity for complying to the specified turnaround.	2	3	6

22	Global events (e.g., pandemics) obstruct the demonstration cases	WP7	As COVID-19 pandemic showed, risk involving pandemics are critical. Nevertheless, at any case the consortium will continue working on technical evolution and monitoring of the pilots remotely; on-site demonstrations will be resumed once the situation normalises.	1	5	5
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Notes: *Likelihood: Ranking from 1 to 5 (1=the least probable; 5=the most probable)*

Severity: Ranking from 1 to 5 (1=minor effect; 5=the most severe effect)

6 - References

- BlueBARGE "Grant Agreement" 101138694, FINAL version 01, 2023-11-21
- BlueBARGE "Consortium Agreement", FINAL version 01, 2023-12-22
- BlueBARGE "D1.1: BlueBARGE Project Administrative and Financial Management", Final Version v1.0, 2024-04-26