



PEM ELECTROLYSERS FOR OPERATION WITH
OFFGRID RENEWABLE INSTALLATIONS

Quality Management Plan

Deliverable 1.1



GRANT AGREEMENT
700359



liten
cea tech



D1.1 Quality Management Plan

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Summary

The Quality Management Plan (QMP) documents the necessary information required to effectively manage project quality from project planning to delivery. It defines the project's quality policies, procedures, criteria and areas of application, roles and responsibilities taken by the partners involved in ELY4OFF.

The quality management of the project has been developed by the Project Coordinator with the support and advice of Steering Committee, aiming at guaranteeing that the goals of the project are achieved and the contractual links adopted in the Gran Agreement.

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1. INTRODUCTION. PURPOSE OF THE QUALITY MANAGEMENT PLAN.

The Quality Management Plan (QMP) documents the necessary information required to effectively manage project quality from project planning to delivery. It defines the project's quality policies, procedures, criteria and areas of application, roles and responsibilities taken by the partners involved in ELY4OFF.

The quality management of the project has been developed by the Project Coordinator with the support and advice of Steering Committee, aiming at guaranteeing that the goals of the project are achieved and the contractual links adopted in the Gran Agreement.

The main objectives of the QMP are:

- Define the structure of the members of the project and their responsibilities.
- Establish the procedures to ensure the quality of the project and the project's documents.
- Define the quality indicators of the project.
- Describe the methodology to ensure a good monitoring and reporting of the project.
- State the bases of the risk management

The QMP is applicable to all the activities within the ELY4OFF project, and the compliance of its execution with this Plan is required for anyone involved in the project. It will be focus on the prevention of deviations during each task of the project and the assurance of the contractual quality requirements in the deliverables submission.

2. QUALITY TEAM ROLES AND RESPONSABILITIES

2.1 Organizational structure

The project management structure interrelation in the execution of the ELY4OFF is as follow:

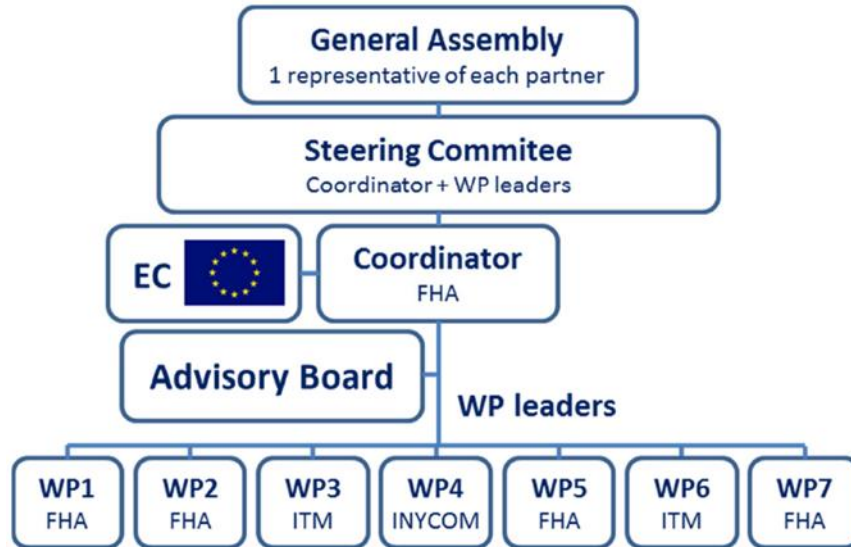


Figure 1. Project Management structure

FHA is the Project Coordinator and is responsible for leading ELY4OFF Management Structure, and chairs the General Assembly (decision-making body) and Steering Committee (execution body).

2.2 Quality Responsibilities

The **Project Coordinator** has the following responsibilities:

- Supervision of project progress and assuring the effective achievement of the ELY4OFF implementation plan.
- Definition of quality project communication channels, tools and methods.
- Periodic update of the Consortium Agreement
- Responsible for the collection of partner progress and financial reports and preparation of related reports to the EC
- Oversees the awareness, dissemination and training plans and their deployment
- Oversees the exploitation plan and management of knowledge and IPR issues
- Verify, monitor and control the implementation of quality solutions
- Identify problems and initiate actions to solve the quality problems
- Initiate action to prevent the occurrence of any non-conformity

The **General Assembly**, formed by one representative per partner, has the following responsibilities directly related to quality management:

- Approval of the management structure and project direction
- Ensure the proper application of Gran Agreement and Consortium Agreement
- Monitor overall project progress against objectives and milestones

The **Steering Committee**, formed by the Coordinator and the WP leaders, has the following responsibilities directly related to quality management:

- Continuous management of the project
- Monitoring of the project execution
- Monitoring of the project progress and revision of the achievements
- Approval of the knowledge, networking activities, awareness, dissemination and training plans and IPR protection strategy

Although the final responsibility relies on the Project Coordinator, all the partners are responsible for ensuring high quality deliverables and assuring excellence in execution.

2.3 Quality Management Team

The Quality Management Team (QMT) will be composed by one member of the WP leader to which below each deliverable and one member of the coordination team. In the case the coordination is the same as the WP leader, the deliverables will be also review by another member of the consortium defined after the approval of the QMP and formally approved by the General Assembly (GA).

3. QUALITY CONTROL OF THE PROJECT

The hierarchy defined in management structure results in responsibilities for a proper implementation of the work plan. Each WP leader is therefore responsible for the achievement of WP specific goals, being in close contact with the Coordinator through mails and conferences. Tools used:

- **Reporting:** WP leaders will be responsible for preparing individual reports covering WP progress, deliverables, milestones and compliance with the plan. These reports will be send to the Coordinator, who has the responsibility for collecting them and elaborate a final report summarizing the project status.
- **Cooperation and Communication:** ELY4OFF will look for facilitating partners' cooperation, which is the backbone for project success.
- **Progress Steering Committee (PSC):** every 3-4 months, an online meeting will be carried out in order to review the current situation of every partner involved as well as the budgets deviations. An agenda of the items to discuss will be provided to all the members in advance, and the minutes of the meeting will cover the main aspects treated in the meeting, listings the actions agreed, responsible of the action and its deadline. The coordinator will be the responsible of writing the minutes. It has been created a template for this document.
- **General Assembly:** is the ultimate decision-making body of the consortium and it will take place at least once per year. The operational procedures are similar to those of the Steering Committee.

In the following table, additional characteristics of the meetings of the two main bodies with responsibilities in the management of ELY4OFF are presented:

Convening meetings	Ordinary meeting	Extraordinary meeting
General Assembly	At least once a year	At any time upon written request of the Project Steering Committee or 1/3 of the Members of the General Assembly
PSC	At least quarterly	At any time upon written request of any Member of the Project Steering Committee
Notice of meetings		
General Assembly	30 calendar days	15 calendar days
PSC	14 calendar days	7 calendar days
Sending the agenda		
General Assembly	14 calendar days	7 calendar days
PSC	14 calendar days	7 calendar days

Figure 2. Consortium meetings

The main reporting procedure will be via email among the partners, for sending the agenda, minutes of the meeting, or any other communication that can be required. This decision has been taken considering the low number of partners of the consortium (only 5).

A repository with the contact details of persons by each partner involved in the project has been created.

4. QUALITY CONTROL OF THE DELIVERABLES

The deliverables of the project will be used as milestones to monitor the progress of dissemination activities. They will generally report about the development of the different stages of the Project, including technical information, results, progress, boundaries and conditions, provisions, control and investigations.

As the deliverables are the main project outcomes, and some of them are public, a professional and clear structure is paramount. A quality control is very essential to succeed in the project execution, verifying that the objectives are achieved.

The partner responsible of each deliverable will be asked to establish the dissemination potential of the deliverable prior to its submission and the revision of the Project Coordinator.

4.1 Design of the deliverable

A set of official templates will be defined concerning all deliverables, technical specifications, spreadsheets, etc. covering file name, font and expected content. All approved documents will be compliant with templates defined in the project, in order to be consistent and regular. The official logo and other parameters to use in the deliverables are described in section 4. The design will also include as minimum content for the deliverables:

- ✓ Cover page with the official logo and the partners involved
- ✓ One page with brief abstract summary and general information of the deliverable. In the public deliverables, a declaration of non-responsibility for a bad use of the information it contains must be written.
- ✓ Index or general contents and figure index.
- ✓ Introduction
- ✓ Main Contents or core
- ✓ Conclusions when necessary

4.2 Deliverable development process

To guarantee the quality of the deliverables, the time delivery as well as the previous preparation must be the priorities.

- During the first phase of the task related to the deliverable, the responsible (WP leader or Project Coordinator) will contact with the rest of the partners in order to determinate a list of content that cover the whole work and objectives of it. This list will be agreed among all the partners involved.
- At least one month before the submission, all the partners involved should send to the responsible their contribution. It is responsible of the author to ask or these contributions and further modifications if they are needed.
- At least 15 days before the submission, the responsible must send the final report to all the partners involved in order to revise and agreed this final version.
- At least 7 days before the submission, the responsible must send the final report to the Quality Management Team (QMT) in order to review if the document meets the Quality Standards expected.
- Once the deliverable is finished, it will be sent to the Steering Committee by the Project Coordinator. After that, it must be uploaded in the Participant Portal of the European Commission, and in case the document is public, in the website of the project.



Figure 3. Deliverable deadline dates (QC: Quality Control; QA: Quality Assurance)

In all the cases, at least two partners should review the deliverable as the QMP envisages.

4.3 Quality Standards

All the participants in the deliverable should agree the content and structure, even if the content and the body of the assessment is under the beneficiary responsibility. The relevant quality standards or measures used to determinate the success of the deliverable are the following:

- **Coherency:** the information within the deliverable must be clear, reliable, real and easy to follow.
- **Relevance:** the information used must be accomplished the requirements and the aims proposed initially, in order to provide useful and quality information.
- **Precision:** the information must answer the key topics, according to the specific research work and its targeted audience.
- **Accordance to the design:** the appearance of the deliverables must be uniform, as it has been described above in the point 5.1.1. For this aim, a deliverable template has been created.
- **Timing:** delays in the deliverable submission

4.4 Quality Control Activities and Submission Process

Quality control activities prevent and resolve errors in project deliverables. They verify that deliverables are of acceptable quality and they meet the quality standards and the coherency and relevance criteria established. Next table shows the activities that the deliverables must meet:

Quality Standards	Quality Control Activities performed by	Timing	Indicators
QC1. Coherency	WP leader	One month before	Missing content Lack or excessive detail Redundancy
	QMT	One Week before	
QC2. Relevance	WP leader	One month before	Irrelevant information
QC3. Precision	WP leader	One month before	References
	QMT	One Week before	Insufficient documentation
QC4. Accordance to the design	QMT	One Week before	Different design
QC5. Timing	WP leader	One month before	Delays

Figure 4. Quality Control Activities

The indicators will be evaluated from 1 to 5 (0.5 intervals are accepted). All the indicators should be above or equal to 3 for the deliverable being approved. The final marks of the deliverable will be as follows:

- Fully accepted (all the indicators are ≥ 3).
- Minor changes needed (≤ 2 indicators with mark under 3).
- Major changes needed (≤ 4 indicators with mark under 3).
- Rejected (> 4 indicators with mark under 3).

The submission and reviewing process is executed after the monitoring of the Quality Activities, and applies to all the deliverables of the project but also to relevant documents. For this submission, the Quality Team will be the only responsible of evaluating the deliverables by the indicators method. To complete the evaluation a template is provided in Annex 1.

The procedure to be set up consists on submitting all reports and relevant project documents to the Quality Team prior to the submission to the Steering Committee or the public domain. The Quality Team will take time to evaluate the documents and then, if consider suitable, communicate to the partners involved and the Steering Committee.

The Coordinator will convert the final document to PDF format file, available for the partners and ready to be uploaded to the website if it is a public document.

5. FILES STRUCTURE AND TEMPLATES

All the documentation provided by ELY4OFF has a visual quality and a standard image specially design. The project has its own identity manual, where there are basic indications to use the logo, as well as suggested formats for composing reports.

Deliverables and internal reports

The predominant format will be Microsoft Word. All pages should be numbered and the structure mentioned in section 4.1 should be used.

- Cover Page: the cover page template with the official logo is available for every partner. It contains also the list of the partners involved as well as the Grant Agreement contract number.
- Figures: all the illustrations, figures, diagrams and tables within the deliverables must have a caption, and all of them will be listed in the index section.

Presentations

The predominant format will be Microsoft Power Point. The content will be clear and coherent.

5.1 List of templates

According to the standards and identity manual previously mentioned, a list of templates has been created for the project:

- ✓ Deliverable
- ✓ Agenda of Meeting (see annex 1)
- ✓ Minutes of Meeting (see annex 2)
- ✓ Deliverable Quality Submission (see annex 3)
- ✓ Presentation

6. RISK MANAGEMENT

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk of a Project. The objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. This section follows the Project Management Institute (PMI) Standards, adapted to the characteristics of ELY4OFF.

6.1 Concepts

6.1.1 Plan Risk Management

It defines the approaches, tools, and data sources that will be used to perform risk management on the project. The project is very well defined in terms of scope, schedule and cost. This structure will be used as the reference to estimate the impacts of any risk. It has to be highlighted that the WPs have been structured in such a way to have easy tracking of milestones and objectives consecution, which also contributes to facilitate the risk management linked to those WP and their interdependencies.

Project Coordinator and WP leaders will form the Risk Management Project Team (from now on Project Team), which will be responsible for the follow-up of the plan, as well as for proposing corrective measures, with a dedicated section in the Steering Committee meetings. At quarterly intervals, each task and WP leader will review the status of each task's achievement for risks identification.

The risk management processes will be performed every 3 months.

The categories of risk (which provides means for grouping potential causes of risk) to use in ELY4OFF are: technical, technical/test, Impact/replication, and coordination.

The quality and credibility of the risk analysis requires that different levels of risk probability and impact be defined that are specific to the project context. The definitions of negative impacts to be used in evaluating risk impacts are:

Project Objective	Very low (0,05)	Low (0,1)	Moderate (0,2)	High (0,4)	Very high (0,8)
Cost	Insignificant cost increase	< 10 % cost increase	10 - 20 % cost increase	20 - 40 % cost increase	> 40 % cost increase
Time	Insignificant time increase	< 5 % time increase	5 - 10 % time increase	10 -20 % time increase	> 20 % time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

Figure 5. Evaluation of the risks

6.1.2 Identify risks

Is the process of determining which risks may affect the project and documenting its attributes. This will be done by the Project Team, using information gathering tools like brainstorming, interviewing, root cause analysis, assumptions analysis, and expert judgment. The outputs of this process will be a document where the results of risk analysis and risk response planning are registered. (See Grant Agreement for the first version).

6.1.3 Perform qualitative risk analysis

It enables project managers to reduce the level of uncertainty and to focus on high-priority risks. The main tool to use is the probability and impact matrix, which is a grid for mapping the probability of each risk occurrence and its impact on project objectives if that risk occurs. Risks are prioritized according to their potential implications for having an effect on the project's objectives. The specific combinations of probability and impact lead to a risk being rated as 'high', 'moderate' or 'low' importance.

The project team will determine which combinations of probability and impact result in a classification of unacceptable, considerable, tolerable, and acceptable.

6.1.4 Plan risk responses

It addresses the risks by their priority, inserting resources and activities into the Budget, Schedule and Project management plan as needed. The usual strategies that can be followed are:

- *Avoid*: the project team acts to eliminate the threat or protect the project from its impact.
- *Mitigate*: the project team acts to reduce the probability of occurrence or impact of a risk.
- *Accept*: project team acknowledge the risk and not take any action unless risk occurs.

6.1.5 Control risks

It covers the implementation of risk response plans, the tracking of identified risks, the identification of new risks, and the evaluation of risk process effectiveness throughout the project. This will be done by the project team in periodic status meetings. As result of these activities, changes can be requested to some parts of the projects (corrective or preventive actions).

5.2 First Risk Assessment

In the following table the risks identified during the proposal phase have been ordered according to their likelihood of occurrence and their consequences in case they happen (last column). The first column refers to the order of appearance in the DoA:

ID	Risk description	Probability		Impact		P x I
		Kind	%	Kind	Value	
18	Delays in deliverables	Moderate	35	Moderate 5 - 10 % time increase Major areas of scope affected	0,2	7
12	Components developed are not included in feasible business plans	Unlikely	10	High Scope reduction unacceptable to sponsor	0,4	4
19	Partner systematically does not fulfil its commitment	Unlikely	8	High 10 - 20 % time increase	0,4	3,2

7	Integration problems with different subsystems in the demo site (connection related, communication or sizing)	Unlikely	7	High Quality and scope reduction unacceptable to sponsor 10 - 20 % time increase 20 - 40 % cost increase	0,4	2,8
6	Hybrid storage system (hydrogen and batteries) does not deal correctly with energy peaks/power requirements	Unlikely	12	Moderate Minor areas of scope affected	0,2	2,4
14	Closing the activity of one company or partner leaving the Consortium	Rare	3	Very high > 20 % time increase > 40 % cost increase Scope reduction unacceptable for sponsor	0,8	2,4
11	Narrow scope of dissemination actions: do not reach stakeholders	Unlikely	10	Moderate Major areas of scope affected	0,2	2
15	Problems between partner communications and/or internal disagreement	Unlikely	9	Moderate 5 - 10 % time increase	0,2	1,8
13	Low interest in the business plan and exploitation strategy by stakeholders/potentially interested bodies	Rare	4	High Scope reduction unacceptable for the sponsor	0,4	1,6
8	Objectives set cannot be tested/validated at stack level	Rare	4	High Scope reduction unacceptable for the sponsor	0,4	1,6
2	High ambition at technical level with stack novel components impacting negatively on costs	Rare	4	High 20-40% cost increase	0,4	1,6
3	BOP components cannot reach the desired variable operation in the modified BOP	Unlikely	6	Moderate Major areas of scope affected	0,2	1,2
9	Power electronics validation is extensive and complicated to execute at full scale	Rare	3	High Scope reduction unacceptable to sponsor	0,4	1,2
10	The demonstration period does not cover all the season/variation possibilities	Rare	5	Moderate Major areas of scope affected	0,2	1
4	PE implemented is too dependent on location and configuration and is not flexible	Rare	5	Low Minor areas of scope affected	0,1	0,5
17	Lack of financial resources from one partner	Rare	1	High > 20- 40 % cost increase 10 - 20% time increase	0,4	0,4
1	Proposed advanced membranes do not comply with technical objectives	Rare	1	High Quality reduction unacceptable to sponsor	0,4	0,4
5	The advances and capabilities required by the Communication and Control System are expensive from the computational/hardware point of view	Rare	3	Low > 10 % cost increase	0,1	0,3
20	Confidential information disclosed	Rare	2	Low Only very demanding applications are affected	0,1	0,2
16	Problems with the IPR management	Rare	2	Low Only very demanding applications are affected	0,1	0,2

Figure 6. Evaluation of the risks

These risks were evaluated during the proposal phase and a contingency/mitigation plan was identified (see Grant Agreement). The probability/impact matrix obtained is:

		Consequences				
		Very low	Low	Moderate	High	Very high
Likelihood	Certain >90%					
	Likely 50%-90%					
	Moderate 15%-50%			18		
	Unlikely 6%-15%			3, 6, 11	7, 12, 19	
	Rare ≤ 5%		4, 5, 16, 20	10	1, 2, 8, 9, 13, 15, 17	14

Figure 7. Risk matrix

This will provide a clear visibility of risk and will assist management decision making, showing the level of danger of every different group of risks:

Acceptable
Tolerable
Considerable
Unacceptable

6 CONCLUSIONS

Continual improvement, the generic term used to describe how information provided by quality assurance and quality control processes is used to drive improvements in efficiency and effectiveness, is the main purpose of this deliverable.

This dossier put together the processes and obligations that the Consortium must satisfy, accomplishing a coherent and adequate development in order to guarantee the highest quality in all of the ELY4OFF's activities.

Once General Assembly accepts these terms, the Quality Management Plan must be followed by all the project partners and members during the whole project life-time.

ANNEX 1: Agenda of Meeting

ELY4OFF Title - Agenda - Draft or not				Date
Place				
8 th of August				
15:00	Welcome and hand shakings			
hour	Coordinator project review			
hour	Introduction to FCH Officer			
hour	Coordinator project review			
hour	Introduction to FCH Officer			
hour	Coordinator project review			
hour	Introduction to FCH Officer			
hour	Coordinator project review			
hour	Introduction to FCH Officer			
...	Lunch			
Day 2				
hour	Meeting Wp2			
hour	Meeting WP 4, validation, environmental and cost assessment			
...	Break			
Day n				
...				
...				

ANNEX 2: Template for Minutes of Meeting

Meeting Minute ELY4OFF

Progress Steering Committee

DATE



MEETING/PROJECT NAME	Progress Steering Committee ELY4OFF XM		
DATE OF MEETING		START	END
LOCATION			
VERSION	1		
ATTENDANCE			
Present		Absent	
AGENDA, RESULTS			
Item/Topic			Discussion led by
Item 1			
WP n°			
Item 2: Budget Deviations			
Item 3: Risk Management			
Item 4: Any other matters			
ACTIONS			
Item/Topic		Responsible of the action	Deadline
1			
2			
ATTACHMENTS			

NEXT PSC MEETING PROPOSED	n th of month year
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ANNEX 3: Template for de quality indicators revision for deliverables

Quality indicators revision for deliverables

Deliverable title: _____ Date: _____

Work Package: _____

Deliverable responsible: _____ Reviewer partner: _____

Indicators:

Related to	Quality criteria	Indicator	Mark
Contents	Relevance	Missing content / lacking detail	
	Relevance	Redundancy / irrelevant information	
	Relevance	Excess of information / excessive detail	
	Coherency	Error in content	
Language	Precision	Lack of references	
	Precision	Spelling and grammar errors	
	Coherency	Easy understanding	
Layout	Accordance to the design	Compliance with the template's structure	
	Accordance to the design	Design (logo, font, etc.)	

Final score of the deliverable (FA: Fully Accepted (all the indicators are ≥ 3), MiC: Minor changes needed (≤ 2 indicators with mark under 3), MaC: Major changes needed (≤ 4 indicators with mark under 3), R: Rejected) >4 indicators with mark under 3):

Comments: