MaxH2DR

Quality Assurance Plan

Tobias Kempken, Pavel Ivashechkin, Thorsten Hauck (BFI)

Valentina Colla (SSSA)

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1. Introduction

The MaxH2DR consortium places a strong emphasis on quality control measures to ensure that this projects' outputs are meeting the highest standards, are presented clearly and are based on either own original work or are properly referenced. This report illustrates the practical implementation of MaxH2DR quality control measures. In this context, it includes the experience and lessons learned from previous research projects performed by the MaxH2DR consortium members.

The consortium has extensive experience in managing complex research projects for the European Commission. The internal processes have been designed so that there is a quality check performed by multiple senior experts at each relevant progression step of MaxH2DR. These processes will be explained in detail below. Additionally, the MaxH2DR governance structure as described in the Grant Agreement and the Consortium Agreement will ensure that the project work will meet the highest quality standards.

This Quality Assurance Plan was developed based on the plan established in the project "Green Steel for Europe" (grant agreement number 882151)[1]. It specifically covers the following items:

- Scope of application;
- Quality targets;
- Quality assurance procedures, including
    - Risk Management, and
    - Documentary evidence;
- Quality checkpoints;
- Personnel responsible for quality assurance.

2. Scope of application

This Quality Assurance Plan applies to any activity related to "MaxH2DR". In this context, 'activity' relates to any work conducted between project start and end. Thus, it applies to a wide range from deliverable report preparation to subsequent quality control measures. In organizational regards, this Quality Assurance Plan covers all staff involved in the "MaxH2DR" project, including the staff deployed for the implementation of the project as well as any additionally deployed staff. The main responsibility for the Quality Assurance Plan application lies with the Project Coordinator (PCO) and Quality Manager (QM). Nonetheless each staff member is bound by this Quality Assurance Plan.

3. Quality targets

The MaxH2DR consortium sets highest quality demands to itself. Thus, it is making sure that the project outputs are meeting highest quality standards and are presented in a clear and focused manner. The outputs are based on own original work or properly referenced.

[1] Green Steel for Europe – Quality Assurance Plan (Deliverable 5.3), February 2020

The implementation of this Quality Assurance Plan is showing the European Commission that all quality requirements for a highly satisfactory performance have been duly planned. The Quality Assurance Plan is a tool for deepening the trust between the MaxH2DR consortium and the European Commission.

In this Quality Assurance Plan, the term 'quality' is interpreted in two ways: related to its 'outputs' (as e.g. deliverable reports) and to its 'procedures' (as e.g. project or contract management).

The definition of quality targets is the key pillar of the Consortium's quality management. Only well-defined and measurable targets can lead the work to the set high level of quality. The following Table 1 provides a detailed quality assessment grid for project outputs based on the specific requirements and needs for MaxH2DR.

Table 1: Quality targets for project outputs.

Quality criterion	Quality standards
Relevancy	• The project is structured to find answers to relevant research questions. • This project's Deliverable reports describe the outcomes in sufficient detail, so that readers will recognize its relevance.
Project design	• The methodological approach fits its purpose and takes into account all identified constraints. • The methodology includes an appropriate mix of approaches and tools. • These are described and documented clearly in each Deliverable report.
Data reliability	• The information used is documented in sufficient detail, including bibliography and annexes where relevant. • Any limitations affecting data reliability or validity are clearly described. • Confidentiality of sources is guaranteed, if required.
Analyses soundness	• The data is analyzed by appropriate processes. • If statistical analyses are used, significance and validity of the results. are reported clearly. Confidence intervals are specified, if relevant.
Robustness	• Sources of uncertainty are well documented. If assumptions are required, this is clearly stated and reasoning is explained in detail. • If there is substantial uncertainty, results are tested for their robustness by checking the influence of assumptions and/or uncertain variables. In these cases, ranges will be indicated.
Credibility	• The findings are based on a systematic and comprehensive review of the available evidence. • Data from different sources are verified (e.g. via triangulation), wherever possible, to produce credible findings.
Validity	• The conclusions are entirely based on the available evidence and research findings. The links between evidence and conclusions are clearly identifiable.

	• The conclusions are not biased in any direction. These are only based on a reasonable and credible interpretation of the evidence.
Helpfulness of recommendations	• The recommendations are clear, realistic and applicable. • The implications (e.g. advantages and disadvantages) of different recommendations are clearly stated.
Clarity	• The project and deliverable reports are written in clear, accurate and unambiguous language. • The deliverables are well structured in a logical and reader-friendly way. Key messages are highlighted (e.g. in an executive summary and/or key findings section). • The length of the deliverables is proportionate to the scope of the relevant tasks. Non-essential elements are included in annexes.

Regarding the quality of project procedures, all staff members employed in MaxH2DR are bound and explicitly committed to professional quality standards. They adhere to the rules and procedures as described in the proposal and Grant Agreement. Particularly, the Consortium Agreement as established between all consortium partners includes provisions on professional conduct, confidentiality and intellectual property. For internal evaluation, the consortium applies the principle of peer review. In this, a group of peers review any project or deliverable report before these are submitted or published. The peers may comment on and require revisions of the draft. The consortium follows this peer-review model to ensure the maximum quality of the projects' output.

4. Quality assurance procedures

Dedicated procedures were developed and will be implemented to guarantee highest quality of MaxH2DR outputs and research procedures. These procedures take into account various events that may occur during the course of a research project.

1.) Open Communication

A major risk in performing an EU funded research project lies in a deviating understanding of the project expectations and requirements. A mismanagement of these may lead to discrepancies that may furthermore lead to unsatisfactory project outcomes. To avoid this, the project consortium seeks to maintain an ongoing open communication the European Commission via its PCO. This is complemented by an open and transparent communication with the External Expert Advisory Board set up for MaxH2DR to continuously synchronize the project approaches with current industrial demands and research questions. With the three groups of the European Commission, the MaxH2DR consortium and the External Expert Advisory Board, a triple-checking of the understanding of expectations and requirements is guaranteed. This also allows for anticipating arising issues and challenges at the output delivery stage. The PCO as well as all members of the dedicated Project Management Team have experience in communicating with the European Commission and other EU institutions.

2.) Editorial and Linguistic Quality

In projects that include partners across different Member States, experience has shown that issues regarding language transparency can arise. Most authors of project and deliverable reports will be non-native English speakers with different linguistic backgrounds. This may affect the style, nature and clarity of the language used in the reports. Therefore, the consortium acknowledges the requirement of a dedicated editorial and linguistic review before submission or publication of any report. This includes high-quality proofreading. Project and deliverable reports need to be concise and to the point, avoiding any repetition of contents. To meet these demands, the editorial work includes two stages. First, the text is edited to check for linguistic style as well as for logical inconsistencies or incomplete referencing. Once the substantive content of the text has been clarified, the final proofreading to check for errors in spelling and punctuation is taking place in a second stage. Issues identified and comments to be addressed will be noted and sent to the partner responsible for the project or deliverable report as well as to the PCO and QM.

Standard Microsoft Word® templates will be prepared in WP4 within the first months of this project. These will be in compliance with the Commission's visual identity, with automatic headings and paragraph styles. Final layout for all reports will be verified by the PCO and the QM.

3.) Intellectual ownership and plagiarism

Plagiarism or the neglection of intellectual ownership is not accepted and will be addressed rigorously. If any improper referencing is detected, the QM will report to the PCO. The corresponding authors of the draft will then be informed and assisted to undertake the required revisions und to use the proper referencing system.

4.) Replacement of Team Members

In given circumstances, the replacement of a Team Member may be necessary. As soon as the PCO is informed of the enduring unavailability of a senior team member, she will notify the European Commission within one week. In a transparent communication with the European Commission the further procedure will be elaborated. If the concerned task is at an advanced stage and the activities assigned to the senior team member to be replaced are relatively small or not specific, a possible option could be to hand over these activities to another senior team member with the same or superior professional profile.

5.) Consortium Internal Management

Appropriate administrative procedures are essential to ensure the functioning of an efficient internal organization. Contractual matters regarding the project will be handled by the PCO, assisted by the Project Management Team, in line with the Consortium Agreement signed by all MaxH2DR partners.

5. Risk management

The MaxH2DR quality assurance approach includes minimising disruptions and delays in this projects' implementation. To account for these, the MaxH2DR consortium has implemented a

dedicated Risk and Innovation Manager. Disruptions or delays may occur due to foreseeable or unforeseeable events. A comprehensive list of foreseeable events as well as the proposed and planned contingency measures were provided in the deliverable report D5.2 “Project risk matrix”. These events and proposed measures will be checked and updated continuously throughout the project duration.

To be prepared for unforeseeable events, a dedicated risk management strategy will be implemented in MaxH2DR. It contains the following four steps:

1.) Communication

Possible risks and delays are being communicated regularly during partner meetings and directly in between the meetings. The communication will be according to the escalation scheme project partner → Work Package (WP) leader → PCO → risk and innovation manager.

2.) Evaluation

The risk severity and consequences for the project schedule, deliverables and milestones are being evaluated continuously.

3.) Mitigation

Dedicated mitigation measures are developed. These include the expertise of the MaxH2DR consortium partners as well as their contacts to external experts. In case of occurring delays, the WP schedule will be adjusted and optimised to minimise the delays. Additionally, the mitigation measures will comprise TRIZ problem solving tools.

4.) Follow-up

The progress of mitigation measures and interactions with other WPs and tasks is controlled. For rapid and systematic development of innovative solutions for the arising technical and administrative risks, TRIZ problem solving tools are being applied. These include a dedicated function analysis, root conflict analysis, 40 inventive principles, 76 inventive standards and a specific algorithm for innovative problem solving (ARIZ). These tools will ensure rapid risk mitigation in this project, contributing towards staying on schedule.

6. Documentary evidence

The consortium’s quality assurance system relies on the traceability of information. Consortium members shall have traceability systems for documents in place. This ensures the capacity to retrieve specific information for the evaluation of outputs, procedures and events.

A project record will be created, including:

- Contractual documents: signed Grant Agreement, Consortium Agreement signed by all partners, amendments, call for proposal, submitted proposal, formal notifications, etc.
- Administrative documents: invoices, bank statement of account, timesheets, travel and subsistence receipts, etc.

- Project Management documents: relevant correspondence with the European Commission, meeting reports, etc.
- Reports and Presentations: draft and final versions of periodical project reports, draft and final versions of deliverable reports, presentation slides, etc.
- Data sources: background documents, literature referenced in the reports, transcription of interviews, survey raw data, databases, any other information and evidence used in the project

Paper documents are stored for at least five years after the end of the project. Electronic documents are stored indefinitely on resident servers. Data are being encrypted if necessary. Period back-up of digital files is performed. Relevant information exchanged orally are transcribed as meeting reports.

7. Quality checkpoints

Besides the upfront planning of the Quality Assurance, as described above, quality assurance and quality control are conducted and supervised continuously throughout the project duration. Quality checks are performed on an ongoing basis by the QM and the PCO. Additionally, at dedicated 'quality checkpoints' the quality of project and deliverable reports and procedures is reviewed. The quality control measures foreseen are as follows.

1.) Verification of (draft) deliverables and interim reports

Against the background of quality control, special emphasis is given to the verification procedures of reports drafts and final versions. The first quality checkpoint for project or deliverable reports consists in sending the reports in draft form for quality check to the QM, the PCO and the respective WP Leaders. This is to happen with sufficient advance to the report deadline. While the report is checked for quality, the consortium can work on the fine-tuning of the report in parallel, if necessary. This may include proofreading or finalization of the layout. The QM must be satisfied with the report quality or otherwise ask for a revision.

Therefore, the following specific procedure has been established for the preparation of the deliverables.

- Each deliverable tackles a specific subject and has an assigned Deliverable Leader (DL) who will coordinate the production of the specific interaction as necessary with the other partners involved.
- Before starting on its production, the DL defines the structure and the expected contributions from each partner in a preliminary document named Document Development Plan (DDP) – according to a template which will be finalized together with the visual identity of the project and will propose the schedule for the development of the deliverable.
- Upon receiving the inputs from the different contributors, the DL merges them into a single document. This first draft will then be circulated for internal review and asked for further inputs. Each involved partner will check and provide their feedback. This iterative procedure will be repeated as necessary, until all involved partners give approval.

- The DL will then prepare a pre-final draft, which will be sent to the QM for peer review. The QM can decide, if needed, to involve partners not directly involved in the deliverable editing with the role of reviewers.
- Within up to 4 days, the identified reviewers will provide feedbacks and comments to the DL and may reiterate and re-circulate the deliverable report as required until the necessary quality level is attained.
- Once the QM has signed off the deliverable, the PCO will transform the document in PDF and upload it onto the EU portal.

Figure 1 summarizes the procedure to be followed for the preparation of deliverables:

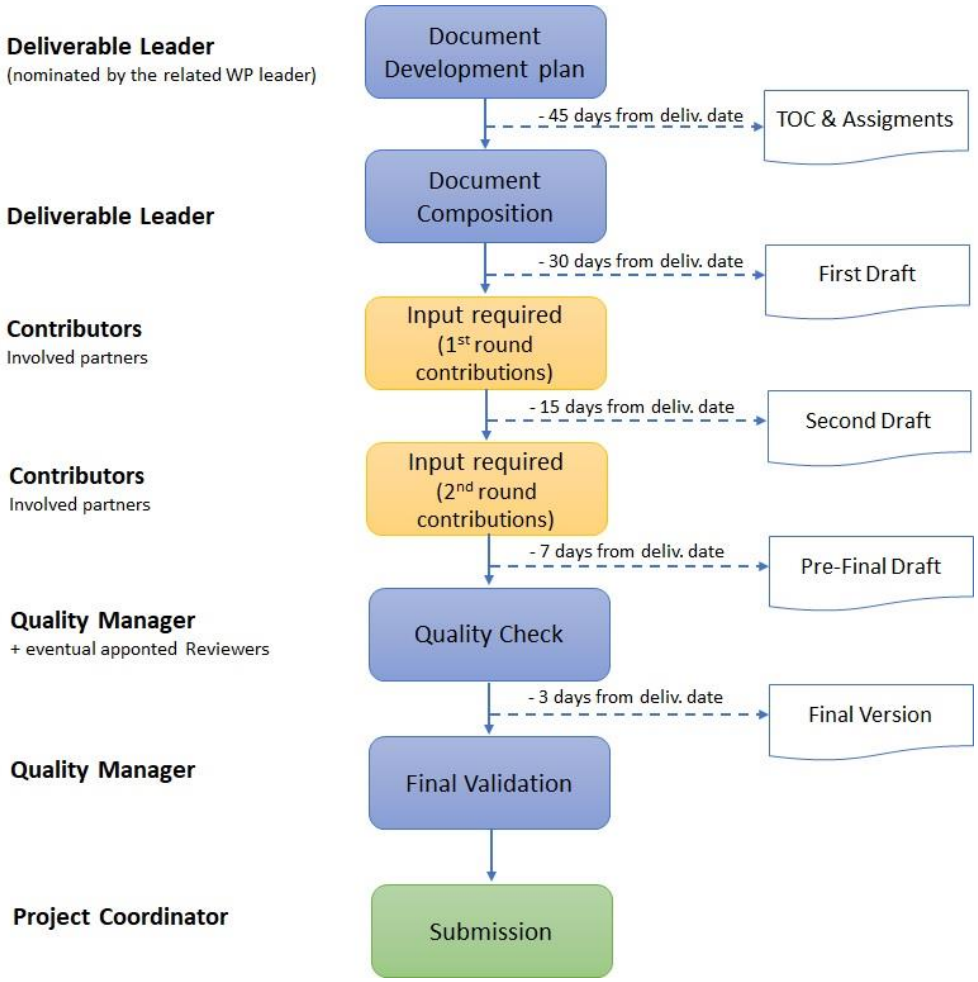

Figure 1: Procedure for Deliverable preparation.

For interim reports, the leading role in the preparation of the document is played by the Technical Project Manager.

2.) European Commission's feedback

The second quality checkpoint is reached once the European Commission's comments on project or deliverable reports are provided. After report submission, highest attention is dedicated to receiving relevant comments by the European Commission and subsequently implementing

required changes, amendments or updates. The assessment of the comments is carried out by the PCO.

3.) Complaint Management System

The consortium implements a complaint management system at the disposal of the European Commission for the duration of the project. The PCO is responsible for receiving and reviewing complaints and ensuring that these are addressed as soon as possible. The European Commission will be able to submit complaints on any issue arising. This may consist of the quality of project or deliverable reports, timeliness, communication, relationship with Commission services or other stakeholders, professional misbehaviour, conflict of interests, etc. The complaint procedure starts with a notification to the PCO. She will get into contact to the European Commission without delay. Then the PCO will consult the Project Management Team within the following 48 hours with the appropriate measures to adopt. In case of a founded complaint, the possible measures may include deploying additional efforts such as execution of additional research, strengthening the research team by including additional senior members or the replacement of non-performing consortium member following the rules of the Consortium Agreement, if necessary. In any case, the contingency measure adopted needs to be confirmed by the European Commission.

8. Personnel responsible for quality assurance

The quality of the project procedures and outputs are checked constantly by the dedicated QM Dr. Thorsten Hauck (BFI) as well as multiple instances as the overall Project Management Team and corresponding Deliverable Leaders and WP Leaders. The Project Management Team consists of the PCO and Dissemination Manager (Prof. Valentina Colla, SSSA), the Technical Project Manager (Dr. Tobias Kempken, BFI), the Compliance & IPR Manager (Dr. Petra Ebermann, BFI), the Communication Manager (Delphine Snaet, ESTEP), the Risk and Innovation Manager (Dr. Pavel Ivashechkin, BFI) and the Exploitation Manager (Dr. Anna Bozza, CIAOTECH). The roles are clearly coordinated, so that the joint effort of these instances will ensure the respect for quality standards.

The Technical Project Manager is responsible for the duly implementation of project activities. He ensures a timely execution of the work required for Deliverable preparation and creation. The primary task of the QM is to assess the quality of the work performed and of reporting. He verifies that the activities being performed and the deliverables produced under a specific Task and WP are compliant with the applicable quality standards. The QM provides advice prior to the provision of each agreed Deliverable or report to the European Commission and periodically upon necessity. He works in close relation with the PCO and the WP Leaders. The QM must be satisfied with the work and will otherwise ask for revisions.

The PCO is responsible for the finalization of the Deliverables, and their presentation to the European Commission. The Technical Project Manager will provide the QM with the information needed and the Deliverables in draft form for quality check. He performs the quality checks of the contributions of team members with sufficient advance before the deadlines for the submission of a Deliverable. If needed, he sends feedback and recommendations, asking for necessary improvements or clarifications. The PCO consults with the QM to ensure that the Deliverables meet

the quality standards required. Furthermore, she will stay in regular contact with the European Commission to swiftly identify and address expectations and requests and assess satisfaction with the outputs produced

The Compliance & IPR Manager makes sure that the contents of each Deliverable report do meet compliance conditions as well as do not constrict to any existing intellectual property rights. The Communication manager ensures a timely and high-quality communication to external stakeholders. The Innovation and Risk manager is responsible for identifying risks and suggest suitable mitigation measures well in advance. He will be assisting with proven methods (e.g. TRIZ) in solving any arising challenges. The Exploitation Manager ensures a high-quality process of exploiting the project results.

Table 2 summarizes the persons who are responsible for project management and WP leaderships and, as such, also have a role in quality management and quality assurance, under the coordination of the QM.

Table 2: Summary of the responsible persons for project management and WPs leaderships

Project Management Team	
Project Coordinator	Dr. Valentina Colla (SSSA)
Technical Project Manager	Dr. Tobias Kempken (BFI)
Quality Manager	Dr. Thorsten Hauck (BFI)
Compliance & IPR Manager	Dr. Petra Ebermann (BFI)
Communication Manager	Delphine Snaet (ESTEP)
Dissemination Manager	Dr. Valentina Colla (SSSA)
Risk & Innovation Manager	Dr. Pavel Ivashechkin (BFI)
Exploitation Manager	Dr. Anna Bozza (CIAOTECH)
Work Package Leaders	
WP 1	Prof. Fabrice Patisson, Dr. Olivier Mirgaux (UL)
WP 2	Dr. Thorsten Hauck, Thomas Piontek (BFI)
WP 3	Dr. Valentina Colla, Dr. Ismael Matino (SSSA)
WP 4	Dr. Valentina Colla
WP 5	Dr. Thorsten Hauck, Dr. Tobias Kempken (BFI)

9. List of Figures

10. List of Tables

11. List of Acronyms and Abbreviations

Acronym	Full Name
ARIZ	Algorithm for innovative problem solving
BFI	VDEh-Betriebsforschungsinstitut GmbH
DL	Deliverable Leader
DDP	Document Development Plan
ESTEP	European Steel Technology Platform
IPR	Intellectual Property Rights
PCO	Project Coordinator
CIAOTECH	CIAOTECH s.r.l.
QM	Quality Manager
SSSA	Scuola Superiore Sant'Anna
TRIZ	Theory of inventive problem solving
UL	Université de Lorraine / University of Lorraine
WP	Work Package