

D1.2

**Quality Assurance and Risk
Management Plan
(QA&RMP)**
Final Version



skillbill

SKILL TO BOOST INNOVATION & PROFESSIONAL
FULFILLMENT IN A SUSTAINABLE ECONOMY

AzzeroCO2

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ABBREVIATIONS

AB	Advisory Board
CA	Consortium Agreement
CAPA	Corrective Action and Preventive Action
CM	Communication Manager
DMP	Data Management Plan
DOI	Digital Object Identified
EC	European Commission
FAIR	Findable, Accessible, Interoperable And Re-Usable
GA	Grant Agreement
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
LCA	Life Cycle Analysis
OS	Open Science
PM	Project Manager
PMP	Project Management Plan
PO	Project Officer
QA	Quality Assurance
QAP	Quality Assurance Plan
RES	Renewable Energy Sources
TCC	Technical Coordination Committee
VET	Vocational Education and Training
VR¹	Virtual Reality
WP/ WPL	Work Package /Work Package Leaders

¹ Virtual reality (VR) implies a complete immersion experience that shuts out the physical world. Augmented reality (AR) adds digital elements to a live view often by using the camera on a smartphone. In a Mixed Reality (MR) experience, which combines elements of both AR and VR, real-world and digital objects interact. Extended Reality (XR) is an umbrella term that covers all of the various technologies that enhance our senses, whether they're providing additional information about the actual world or creating totally unreal, simulated worlds for us to experience. It includes Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) technologies. (www.fi.edu/differencebetween-ar-vr-and-mr)

Executive Summary

This deliverable provides the final version of the **SKILLBILL Quality Assurance and Risk Management Plan (QA&RMP)**. Throughout the project's lifecycle, the document has been updated to reflect the workflow and the activities carried out to achieve the objectives, results, and outcomes defined in the Grant Agreement.

The present **Quality Assurance and Risk Management Plan (QA&RMP)** covers all aspects related to the technical quality of the data produced, as well as the overall risk management of the project.

1. Overview

The purpose of this document is to define a consistent set of working procedures, processes and best practice guidelines that were followed in order to ensure the achievement of goals and quality standards of the Project outcomes.

This document is a guide for the project coordination, ensuring that quality reviews took place at appropriate points during the project. It also acted as a reference for all project partners, helping them to understand their responsibilities and roles with regard to project deliverables and outcomes.

In addition, the document served as a guide for the partners to establish effective cooperation within the consortium and to ensure the highest level of quality in project documentation.

Its main aims are:

- To describe the SKILLBILL quality management (Section 2 - SKILLBILL Quality Management);
- To describe the SKILLBILL risk management (Section 3 - SKILLBILL Risk Management).

1.1 Quality Management – General Information

Quality management is any systematic process of determining whether a product or service meets specified requirements. Quality establishes and maintains the standards and procedures for developing reliable products, to meet expectations of customers (in this case European Community, Advisory Boards and stakeholders) and increase confidence and credibility, while also improving work processes and efficiency.

In the SKILLBILL project, Quality was a joint responsibility of all partners. The Project Coordinator (PC) and the Technical Coordination Committee (TCC) had the authority to implement and verify compliance with all quality evaluation policies and procedures.

Quality management ensured that the SKILLBILL project consistently functioned as desired throughout its duration. It has been applied to all project activities and outputs including deliverables, documents, reports, training materials, dissemination and communication elements, workshops, events and any other tangible and/or intangible outcome produced within the consortium.

As detailed in Section 2, quality management was implemented through four main components:

- Quality planning: to design a process that allowed the consortium to meet the established goals under real operating conditions. This included the definition of clear procedures,

responsibilities, and deliverable requirements, which provided a structured framework for all activities.

- Quality assurance: to prevent mistakes in the production of documents, deliverables or any other kind of project outputs. Regular internal checks, predefined templates, and shared guidelines contributed to maintaining consistency and reliability across the consortium's work.
- Quality control: a dedicated process by which entities review the quality of the outputs. Deliverables and results underwent internal evaluation by partners ensuring that all products met the technical, methodological, and formal standards set in the Grant Agreement.
- Quality improvement: to progressively improve the overall quality of the project results through feedback loops and continuous monitoring mechanisms. This has allowed the consortium to refine methods, strengthen collaboration, and enhance final outputs.

1.2 Risk management – General Information

Risk management is the process of identifying, assessing, and controlling potential problems before they occur so that risk-handling activities may be planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives.

One tool that can be used in risk management is the Corrective and Preventive Actions (CAPA) procedure. Corrective and Preventive Actions (CAPA) are processes designed to improve quality and handle risks as well as other undesirable situations. The CAPA processes should be well defined to support an effective and efficient project management process. The main purpose of the Corrective and Preventive Actions is:

- to collect and analyse information,
- to identify and investigate quality problems,
- to take appropriate and effective corrective and/or preventive actions to avoid their recurrence.

The steps include:

- identification of the problem,
- evaluation of the risk,
- preparation of a procedure for the investigation,
- analysis of the root cause(s),
- action plan for corrective and/or preventive actions,
- implementation of action,
- follow-up.

In simple terms, corrective action prevents recurrence, while preventive action prevents occurrence. Corrective action is carried out after a nonconformity has already occurred, whereas preventive action is planned with the goal of preventing a nonconformity in its entirety.

According to ISO 9001, the differences between Corrective (also known as risk-based thinking) and Preventive actions are:

- 8.5.2 Corrective Actions: “The organization shall take action to eliminate the causes of nonconformities in order to prevent a recurrence.”
- 8.5.3 Preventive Actions: “The organization shall determine action to eliminate the causes of potential nonconformities in order to prevent their occurrence.”

2. SKILLBILL Quality Management

2.1 Project quality management

2.1.1 *Project quality responsibilities*

The Project Manager (PM) is a staff member of the Coordinator (namely AzeroCO2), as described in the Deliverable 1.1 Project Management Plan (PMP) and Data Management Plan (DMP). The PM oversaw the scientific and technical direction of the project and the project deliverables, managed financial planning and control, and maintained communication with the Project Officer (PO).

Each Work Package (WP) was coordinated by a WP Leader (WPL), responsible for the implementation of the respective WP in line with the work description. The WPL reviewed and evaluated intermediate and final WP outputs in collaboration with other WP partners, and cooperated with other WPLs as well as the Advisory Board.

The WPLs had the responsibility for the high quality and the respect of the agreed timeline of the respective technical deliverables and other materials related to their WPs.

The full description of the Project Management structure, including roles and responsibilities are reported in Deliverable D1.1, chapter 6.1 - Project Management general structure, roles and responsibilities. This section addresses quality management in relation to documents and deliverables, considered as the final outputs of the project. However, the quality management process encompassed all project activities and workflows.

2.1.2 *Quality planning: project document preparation*

The following principles were applied to the preparation of all the project documents:

- All documents were written using the standard format supplied (D6.1);
- All documents followed rules set out in D1.1 for making data findable (with particular attention to paragraph 4.3.2 on file naming and 4.3.3 on file numbering) and for making data accessible (see chapter 4.4);
- All Partners ensured the maximum level of quality while preparing the documents;
- All the documents received the approval of the WPL and the Coordinator;
- All documents produced for the dissemination included the logo of the EU and of all Partners.

Documents such as Project Deliverables were mandated to:

- I. meet the requirements of the whole Consortium, Advisory Board, and finally of EU,
- II. be aligned to best practices for Project Management,
- III. be suitable for Web publication and for dissemination activities (confidential deliverables excluded),
- IV. be easy to understand and use. More precisely, they had to contain all the information needed by other Partners, to allow them to fairly progress in relevant tasks, avoiding, as far as possible, the necessity of requests for integration, clarification, input of missed data, etc,
- V. be compliant with the Project Management Plan (Deliverable D1.1).

The list of deliverables is described in the GA.

2.1.3 **Quality assurance: deliverables approval**

Documents and deliverables were prepared by the responsible partner for the activity, then validated in terms of quality, by the WPL and by PM. The following procedure were followed:

- The author of the deliverable performed the first document check;
- The deliverable was circulated among all Project Partners, whether or not involved in the same activity. The deliverable was forwarded for comments at least 15 days before the due date of the deliverable;
- Partners gave their comments to the author before the due date set by the author. Deliverables not commented by Partners within the due date were considered “checked and approved”;
- The author reviewed the deliverable before handing it over to the PM for final comments and corrections, if any;
- The PM uploaded the deliverable on the EU portal².

Any strong disagreements between reviewing Partners and authors were to be solved by asking advice and counselling to the Advisory Board, as described in the document “*SKILLBILL_DefinitionAB_v01.00*” shared with the AB members in the paragraph PLANNED EFFORT: “Deliverables: upon request, the AB will read and comment deliverables”. This event did not occur, and the process of deliverable preparation and uploading proceeded smoothly and harmoniously. Some deliverables were uploaded with a delay, which was duly justified by informing the Project Officer.

2.1.4 **Quality control: deliverable evaluation**

The deliverables had a uniform appearance, structure and referencing scheme. It was therefore necessary to use document referencing and the template provided (WP6).

² The Coordinator is responsible for uploading the deliverables, not the WPL;
https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/deliverables_en.htm

The content of each deliverable is described in the GA. It covered all the information relevant to the activity from which it originated and all the information needed by other Partners for performing their activities.

The reports met a set of requirements, based on the following aspects:

a) Completeness. Information provided in the deliverable was required to be reliable, complete and supported by relevant references.

b) Accuracy and Conciseness. Information was required to be presented in an objective form, minimising the room for misinterpretation or personal bias, and focused on the key issues.

c) Relevance. Presented information was relevant for the achievement of the Project goals.

d) Language features. Prior to the preparation of the final version, the text was required to be carefully examined to identify and correct spelling and grammatical errors. Wherever possible, technical terms and jargon were to be avoided. If it was not possible, such terms were to be explained.

2.1.5 Quality improvement: performance indicators

In order to improve the overall project quality, it was important to collect data and analyse efforts and performance against indicators.

The Excel document provided in Deliverable 1.1 (ANNEX 2: Work Breakdown Structure; tab RESULTS; OBJ; IND) summarised the overall performance indicators with the target value and timeframe set to reach project objectives, as described in the Grant Agreement.

The performance indicators were meant to measure the performance of the consortium against the principles and processes presented in the current QMP.

The PM collected data regularly, closely working with all partners, and updated the values of the table at least on a monthly basis, which allowed the consortium to take corrective measures if needed, in a timely manner.

2.1.6 Dissemination and Communication Standard

During the Project and for a period of 1 year after the end of the Project, the dissemination of the Results by one or several partners including publications and presentations, shall be governed by the procedure of Article 17 of the Grant Agreement and its Annex 5 and of Article 8 of the Consortium Agreement.

All documents, especially public ones, shall have a common format. The formats are provided within WP6 and approved by the consortium.

Unless otherwise agreed with the granting authority, communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant must acknowledge EU support and display the European flag (emblem) and funding statement (translated into local languages, where appropriate).

When displayed in association with other logos (e.g. of beneficiaries or sponsors), the emblem must be displayed at least as prominently and visibly as the other logos.

Prior notification of any planned publication shall be given to the other partners at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Coordinator and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notification. If no objection is made within the time limit stated above, the publication is permitted.

Any communication and dissemination material must be approved at least by the Communication and Exploitation Manager and the Project Manager.

3. SKILLBILL Risk Management

“A risk is an event or condition that, if it occurs, could have a positive or negative effect on a project’s objective”³.

A risk is any uncertain event or condition that might affect the project. Not all risks are negative. Some events (like finding an easier way to do an activity) or conditions (like lower prices for certain materials) can be beneficial for the project. When this happens, it is called an opportunity, but it is still handled just like a risk. The risk is computed from the probability of the event becoming an issue and the impact it would have. Various factors should be identified in order to analyse risk.

$$\text{RISK} = \text{PROBABILITY} \times \text{IMPACT}$$

Risk management is not about eliminating risks but about identifying, assessing, responding to, monitoring and controlling, and reporting risks. Developing an effective Risk Management Plan can help prevent small issues from developing into emergencies.

This Risk Management Plan defines how risks associated with the SKILLBILL project were identified, analysed and managed. It outlines how risk management activities were performed, recorded and monitored throughout the lifecycle of the project, and provides templates and practices for recording and prioritizing risks by the Project Manager and the whole project team.

3.1 Risk Management Procedure

The Risk Management Plan described in this document deals with calculating the probability of an event and the potential impact of that event on the project’s implementation, in order to foresee and

³ Raz T, Shenhar AJ, Dvir D (2002) Risk management, project success, and technological uncertainty. R&D Manag 32:101–109

avoid it or finally to mitigate the problems associated with those risks. The required steps are listed below:

1. RISK IDENTIFICATION: Potential Scenarios

A checklist of potential risks was prepared to gain a clearer understanding of possible issues and to focus on areas where risks are most concentrated.

2. RISK EVALUATION: Probability and Impact

After all potential risks had been identified, each risk was evaluated based on the likelihood of occurrence and the potential impact it could have had on the project. The purpose of risk evaluation was to determine which risks were most likely to occur and which could have had the most significant negative consequences.

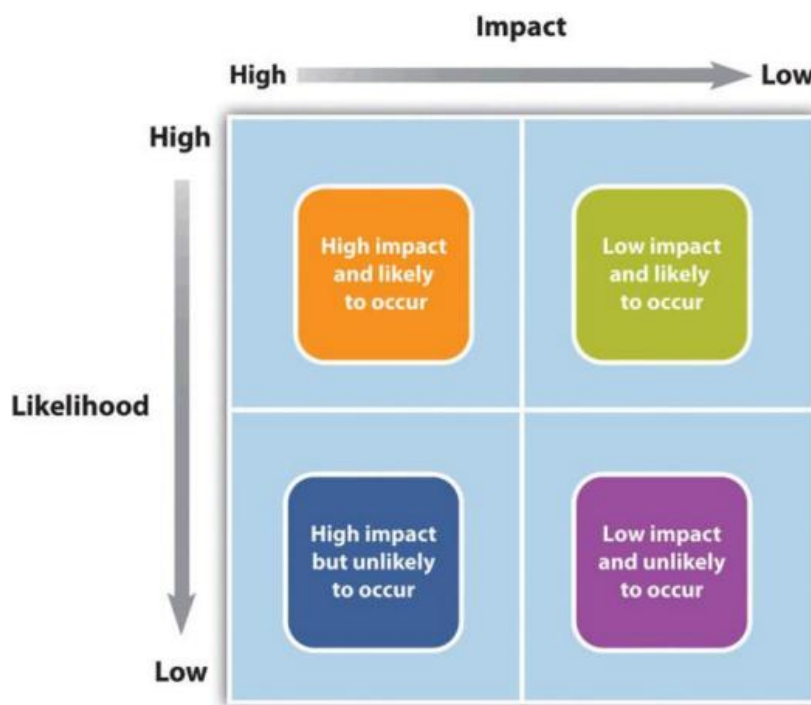


Figure 1: Probability (or Likelihood) and impact

Establishing criteria for high-impact risks could have helped prioritize the few critical risks that required mitigation and contingency measures. Each risk was assessed according to the project’s actual progress and available knowledge, meaning that evaluations could have changed over time.

- Assign probability: For each identified risk, the project team determined if the probability of it actually materializing was High, Medium or Low, as described below in Table 1.

Probability		
	0	If the probability of an event occurring is zero, then it is not considered
Low	1	Rare (< 5%)
Low	2	Unlikely (5% - 15%)
Medium	3	Moderate (15% - 50%)
High	4	Likely (50% - 90%)
High	5	Almost certain (> 90% chance)

Table 1: Probability

- Assign impact: For each identified risk the project team determined the potential Impact as High, Medium or Low, as described in Table 2.

Impact		
	0	If the impact of an event is zero, then it is not considered
Low	1	Insignificant (Risk is mitigated by normal day to day adaptation)
Low	2	Minor (delays up to 10% of schedule, no long-term changes in the project)
Medium	3	Moderate (delays up to 30% of schedule and few additional costs)
High	4	Major (Delays up to 50% of schedule or major changes in the action)
High	5	Catastrophic (action abandoned)

Table 2: Impact

3. **RISK MITIGATION; PREVENTIVE ACTIONS:** How Probability and Impact could be reduced

After the risk had been identified and evaluated, the project team developed a risk mitigation plan aimed at reducing the Probability and Impact of unexpected events through various approaches:

- *Avoid* – Eliminate the threat or condition, or to protect the project objectives from its impact by eliminating the cause.
- *Mitigate* – Identify measures to reduce the probability or impact of the risk.

- *Accept* – Take no action and accept the risk.
- *Back-up plan* – Define contingency actions to be taken in response to risks.
- *Transfer* – Shift the consequence of a risk to a third party, together with ownership of the response by making another party responsible for the risk (buy insurance, outsourcing, etc.)

Each of these mitigation techniques could have effectively reduced individual risks and the overall project risk profile. The risk mitigation plan captured the risk mitigation approach for each identified risk and the actions the project management team took to reduce or eliminate the risk.

4. RISK RESPONSE; CORRECTIVE ACTIONS: How to react to an occurred risk

After the risk evaluation and ranking, those risks falling within the Red zones (as described in Table 3) and those whose mitigation approach is ‘*Back-up plan*’ were closely monitored. For these, a risk response strategy was prepared, outlining the actions to be performed if the risk actually occurred. These measures represented contingency or corrective actions.

Impact	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

Table 3: Risk ranking

Risk scores reflected the status of the project and could have changed over time because of the evolution of the project implementation and the additional information acquired by the partnership.

5. CONTINUOUS MONITORING of risks and plans

Continuous monitoring was performed to assess both the risks and the effectiveness of mitigation plans as the project progressed. This ensured that any risk element that became an actual issue could be addressed and that management and contingency plans were updated as necessary. A risk was considered closed - and no longer required monitoring - when it no longer posed a threat.

3.2 Methods for Risk Identification

The initial risk identification involved the project team, appropriate stakeholders, and included an evaluation of environmental factors, organisational culture and the project management plan including the SKILLBILL project scope, schedule, cost, or quality.

Careful attention was given to the project deliverables, assumptions, constraints, cost/effort estimates, resource plan, and other key project documents. The following methods helped to identify the risks associated with SKILLBILL:

- Brainstorming
- Interviewing
- SWOT (Strengths, Weaknesses, Opportunities and Threats)
- Diagramming

A first list of all the project risks was given in the proposal submission. This was further elaborated to give a first ranking reported in Table 4. The research to identify other potential risks continued throughout the duration of the project and it is reported in chapter 3.4.

3.3 Risk Evaluation, Mitigation and Contingency Action

All risks initially identified, were assessed to categorise the range of possible project outcomes.

For the value of Impact and Probability the values are the ones in Table 1 and Table 2.

The final risk evaluation reflected the mitigation strategy in place. If necessary, to reduce the level of a risk, an additional mitigation strategy was identified following the approach described in the chapter 1.2.

Finally, contingency actions were identified for the risks that were in the red zone and for the risks whose mitigation approach was 'Back-up plan'. The contingency actions have been continuously evaluated and updated.

When a risk, foreseen or not, occurred, any person involved in the project had to notify the WPL and the PM. A discussion for the risk evaluation and contingency actions to be put in place followed, involving at least the person implicated, the WPL and the PM. The responsibility to perform the actions relied on the WP Leader, while the Project Manager closely monitored the activities, deciding the priorities, urgencies and eventual additional efforts.

The risks initially identified for SKILLBILL are discussed in this chapter following the order of the WPs. Table 4 gives the concise overview of the risks identified in the project proposal, where a level of probability/severity was already given (low/medium/high, that in this document has been converted into scores (as for Table 3). Additional comments were included, some scores revised in respect to the project proposal and a new risk was identified.

Risk N°	WP	Foreseen in the proposal	Description	Mitigation approach	Probability (1-5)	Impact (1-5)	Evaluation (Pxl)
1	WP1	YES	Poor performance of Partners/Partner not responding to Coordinator and partners' requests. (LOW prob. /MEDIUM imp.)	<p><u>Preventive.</u> The SKILLBILL partners' long experience in implementing EU funded projects as well as their wide collaboration in similar activities lowers the probability of poor performance of a partner and not responsiveness.</p> <p>All the procedures have been described in the Consortium Agreement enabling the coordinator to identify any problem and to take the respective corrective actions.</p>	1	3	3
2	WP1	YES	Engaging experts and stakeholders in the Advisory Board process proves difficult. Due to time constraints and missing motivation, stakeholders and experts do not contribute as needed (MEDIUM prob. /HIGH imp.)	<p><u>Preventive.</u> The Advisory Board will be set up soon in order to engage the relevant stakeholders and experts in the co-creation process. Experts/stakeholders providing substantial contributions will have fees for their involvement (included in the budget proposal).</p> <p>Stakeholders and experts will also be selected based on their activities and engagement in previous projects of partners.</p> <p>Benefits of joining the Advisory Board will derive from the project's results.</p>	3	3	9
3	WP1	YES	Not reaching the KPIs and expected results defined. (LOW prob. / HIGH imp.)	<p><u>Preventive/Corrective.</u> The KPIs and expected results foreseen in the impact section are based on previous similar activities that partners have</p>	2	5	10

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				<p>already organised under EU projects they participated in.</p> <p>The coordinator, together with the WP leaders, will monitor the achievement of the foreseen KPIs and implement timely corrective measures.</p>			
4	WP2	YES	Stakeholders not involved properly (LOW prob./ MEDIUM imp.)	<p><u>Preventive</u>. Potential stakeholders have already been identified; the consortium's network will guarantee that other stakeholders will be involved. Fees are foreseen for them.</p>	1	3	3
5	WP3	YES	<p>Low number of visitors of the Green portal;</p> <p>not enough /interesting material (MEDIUM prob./ MEDIUM imp.)</p>	<p><u>Preventive</u>. There will be robust communication and dissemination efforts that will be rolled out during the initial part of the project, and these will support channel traffic also towards the Green Portal: the green portal will be linked to the project web site.</p> <p>In addition to that, a web manager and a social influencer will guarantee the correct flow of material.</p> <p>Advisory Board and the stakeholder joint initiative (WP2) will help to define which kind of material can be interesting to several different target groups.</p>	3	3	9
6	WP4	YES	Students are not willing to participate in the European Master/ lack of students (MEDIUM prob., HIGH imp.)	<p><u>Prevention/corrective</u>. SKILLBILL implements a wide range of activities in 7 partners' countries and at European level.</p> <p>In WP2 partners will engage the stakeholder to identify the skill gaps and define the academic objectives and the characteristics of hands-on</p>	3	5	15

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				<p>training and activities, to attract and influence students among other stakeholders; to increase the impact of the project's activities, ensuring that the MSc addresses the needs and interests of the market.</p> <p>In WP3 and WP6 the green portal and the web page should increase the interest in RES and in the project activities, making the Master more visible and appealing.</p> <p>Project events will be organised (where possible) within the context of large-scale international events and exhibitions that will ensure wide participation to boost the student applications.</p>			
7	WP4	YES	Enrolment of students at participating institutions is imbalanced (MEDIUM prob./ HIGH imp.)	<u>Corrective.</u> Limit the number of students who can enrol at each institution. If one institution lacks applications to fill all vacancies, establish procedures to transfer students from one institution to another, if possible.	3	5	15
8	WP4	YES	The MSc degree cannot be validated in a participating country (LOW prob./ HIGH imp.)	<u>Preventive.</u> All universities involved have established quality assessment procedures that comply with the European Qualification Framework. Level 7 courses are regularly validated across Europe upon release of a transcript. Each Unis can provide the certificate for their specific course, foreseen as a specialisation,	2	5	10
9	WP4	YES	One or more elective courses are selected by very few	<u>Preventive.</u> The number of students admitted to each elective course is limited and admissions are	3	5	15

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			students (MEDIUM prob. / HIGH imp.)	assigned based on objective criteria: personal qualifications, gender-balance, balanced representation of participating countries			
15	WP4	NO	Master starts delayed due to administrative problems.	<u>Corrective:</u> Reduce the duration of the MS (e.g. 18 months instead of 24)	4	1	4
10	WP4/ WP5	YES	Lack of local industries to involve in VET and in the Master for the stage (MEDIUM prob. / HIGH imp.)	<u>Preventive/Corrective.</u> The consortium has already contacted some companies (letter of interest); Universities and EREF have their already established network to involve industries; in addition, other stakeholders will be engaged through the WP2	2	5	10
11	WP4/ WP5	YES	The stakeholders do not provide adequate and detailed information that is required for comprehensive Segmentation and training needs analysis, and finally for the design of VET education and training contents (LOW prob./ MED imp.)	<u>Preventive/Corrective.</u> Experts/stakeholders (WP2) providing substantial contributions will have fees for their involvement (included in the budget proposal). Stakeholders and experts will be selected based on their activities and engagement in previous projects of partners. If they do not provide adequate and detailed enough information an ad hoc meeting will be organised.	2	3	6
12	WP4/ WP5	YES	Incompatibility of different devices and hardware (LOW prob./ MED imp.)	<u>Preventive.</u> Preliminary meetings between Unis were held at the beginning of the project in order to have a full list of devices; this will enable them to check the compatibility and to buy the ones really required for the VRX. Since the coordination of the equipment was planned well ahead of the start of the courses	2	3	6

				(already several specific meetings performed in Nov 2022), the risk is lowered. <u>Corrective.</u> If some device is not adequate, a new purchase (or rent) will be done.			
13	WP5	YES	Constraints connected with training room size (MEDIUM prob./ MED imp.)	<u>Preventive.</u> As for VET training interaction between users is recommendable, small groups of 2-3 people will be trained per session. All UNIS has a room to perform the VR training (if not available, the gym will be used).	2	2	4
14	WP6	YES	Poor dissemination outcomes not replicable or exploited (MEDIUM prob./ HIGH imp.)	<u>Preventive.</u> An adequate dissemination strategy will be carried out (WP6), in collaboration with all partners to attract the best stakeholders. Further, the outcomes are designed in light of future replication in different settings/regions/countries. Wide dissemination and promotion of exploitable assets is foreseen from the early stage of the project, including, mobilisation and mutual learning workshops and debates and coordination of working groups.	1	4	4

Table 4: Project risks overview

3.4 Risk Monitoring, Controlling, Reporting, Acting

Partners tracked, monitored, controlled, and reported the level of risk of each action throughout the project lifecycle, on a regular basis.

Risks were assigned to the Work Package Leader, who regularly reported on the status and effectiveness of each risk response action to the Project Manager and Project Coordinator. The main tools used to monitor project progress and related risks were the Monthly Electronic Update (deliverable D1.1) and the Work Breakdown Structure. In particular, the continuous monitoring enabled by these tools proved essential for effective project management. The Monthly Electronic Update ensured systematic tracking of progress against planned objectives, while the Work Breakdown Structure provided a clear framework for defining and organizing tasks, responsibilities, and dependencies. Together, they facilitated interventions when predefined risks emerged and supported the early detection of unforeseen threats. This proactive approach allowed the consortium to address issues before they could compromise outcomes, thereby safeguarding both the quality and the overall success of the project.

If a risk event occurred, the CAPA technique was put into action, the list in Table 4 was reviewed and re-prioritized and the risk management plan reflected all changes to the risk lists including secondary and residual risks. The lessons learned were captured and recorded in this document as well. The steps include:

- description of the problem occurred;
- analysis of the root cause(s);
- action plan for corrective actions to eliminate or reduce the problem and consequences;
- implementation of corrective action;
- follow-up and action plan for preventive actions to avoid recurrences.

Table 5 provides a structured overview of the risks identified at the beginning of the project, indicating whether or not they actually materialized during its execution. It details each risk initially identified, specifying whether it occurred, when it occurred, and the mitigation or adaptation measures that were implemented. The purpose of this table is to show how potential negative impacts were managed and minimized, thereby supporting the overall success of the project. On the other hand, Table 6 provides a comprehensive overview of the risks that were not foreseen at the beginning of the project but emerged during the course of the activities. Table 5 and Table 6 were added in the final version of the Deliverable, after the successful completion of most activities, and offer both a retrospective and evaluative perspective.

Risk N°	WP	Description	Mitigation approach originally foreseen	Did the risk occur? (Yes/No)	If Yes, in which period? (First/Second)	Actual Mitigation/Adaptation Measure implemented
1	WP1	Poor performance of Partners/Partner not responding to Coordinator and partners' requests. (LOW prob. /MEDIUM imp.)	<p><u>Preventive.</u> The SKILLBILL partners' long experience in implementing EU funded projects as well as their wide collaboration in similar activities lowers the probability of poor performance of a partner and not responsiveness.</p> <p>All the procedures have been described in the Consortium Agreement enabling the coordinator to identify any problem and to take the respective corrective actions.</p>	No	N.A.	In addition to the foreseen mitigation actions, when minor problems occurred, the monitoring instruments allowed a rapid intervention and an effective solution.
2	WP1	Engaging experts and stakeholders in the Advisory Board process proves difficult. Due to time constraints and missing motivation, stakeholders and experts do not contribute as needed (MEDIUM prob. /HIGH imp.)	<p><u>Preventive.</u> The Advisory Board will be set up soon in order to engage the relevant stakeholders and experts in the co-creation process. Experts/stakeholders providing substantial contributions will have fees for their involvement (included in the budget proposal).</p> <p>Stakeholders and experts will also be selected based on their</p>	No	N.A.	The foreseen mitigation measures were applied to prevent the risk occurrence. A balance - in terms of gender, geographical distribution and competences - was established.

			<p>activities and engagement in previous projects of partners.</p> <p>Benefits of joining the Advisory Board will derive from the project's results.</p>			
3	WP1	Not reaching the KPIs and expected results defined. (LOW prob. / HIGH imp.)	<p><u>Preventive/Corrective</u>. The KPIs and expected results foreseen in the impact section are based on previous similar activities that partners have already organised under EU projects they participated in.</p> <p>The coordinator, together with the WP leaders, will monitor the achievement of the foreseen KPIs and implement timely corrective measures.</p>	No	N.A.	Activities have been monitored on a regular basis. Almost all KPI targets have been achieved, and for those not reached, a well-founded justification has been provided.
4	WP2	Stakeholders not involved properly (LOW prob./ MEDIUM imp.)	<p><u>Preventive</u>. Potential stakeholders have already been identified; the consortium's network will guarantee that other stakeholders will be involved. Fees are foreseen for them.</p>	No	N.A.	The needed number of stakeholders was identified and involved based on the consortium's preventive actions knowledge/expertise/network of contacts. Stakeholders' participation in the activities was satisfactory.
5	WP3	Low number of visitors of the Green Portal not enough /interesting material (MEDIUM prob./ MEDIUM imp.)	<p><u>Preventive</u>. There will be robust communication and dissemination efforts that will be rolled out during the initial part of the project, and these will support channel traffic also</p>	No	N.A.	To avoid this risk, high quality content was regularly uploaded to the platform and there was a robust communication and dissemination effort (Ad hoc advertisements on social media, sponsored campaigns on Google,

			<p>towards the Green Portal: the green portal will be linked to the project web site.</p> <p>In addition to that, a web manager and a social influencer will guarantee the correct flow of material.</p> <p>Advisory Board and the stakeholder joint initiative (WP2) will help to define which kind of material can be interesting to several different target groups.</p>			<p>Dissemination campaign by White Research), which helped to direct user traffic to the Green Portal. The Green Contest was also key to maximize outreach and engagement. Finally, the effort was complemented by the actions performed in the stakeholder joint initiative (WP2).</p>
6	WP4	<p>Students are not willing to participate in the European Master / lack of students (MEDIUM prob., HIGH imp.)</p>	<p><u>Prevention/corrective.</u> SKILLBILL implements a wide range of activities in 7 partners' countries and at European level.</p> <p>In WP2 partners will engage the stakeholder to identify the skill gaps and define the academic objectives and the characteristics of hands-on training and activities, to attract and influence students among other stakeholders; to increase the impact of the project's activities, ensuring that the MSc addresses the needs and interests of the market.</p> <p>In WP3 and WP6 the green portal and the web page should</p>	No	N.A.	<p>After the first master cycle, a tailored enrolment campaign was carried out (see Table 6, risk number 18). The students showed strong interest in the program, and attendance in the second cycle was more than satisfactory.</p>

			<p>increase the interest in RES and in the project activities, making the Master more visible and appealing.</p> <p>Project events will be organised (where possible) within the context of large-scale international events and exhibitions that will ensure wide participation to boost the student applications.</p>			
7	WP4	Enrolment of students at participating institutions is imbalanced (MEDIUM prob./ HIGH imp.)	<u>Corrective</u> . Limit the number of students who can enrol at each institution. If one institution lacks applications to fill all vacancies, establish procedures to transfer students from one institution to another, if possible.	No	N.A.	The enrolled students come from different countries and from different institutions.
8	WP4	The MSc degree cannot be validated in a participating country (LOW prob./ HIGH imp.)	<p><u>Preventive</u>. All universities involved have established quality assessment procedures that comply with the European Qualification Framework. Level 7 courses are regularly validated across Europe upon release of a transcript.</p> <p>Each Unis can provide the certificate for their specific course, foreseen as a specialisation.</p>	Yes	First	<p>The master degree title is awarded by UNITUS, with MET, USE, UU officially supporting the organization of the program as well as the teaching activities (see Table 6, risk number 17).</p> <p>Although the degree is not jointly awarded by the 4 universities, the Italian degree issued by UNITUS is recognized by all Member States of the European Union.</p>

9	WP4	One or more elective courses are selected by very few students (MEDIUM prob. / HIGH imp.)	<u>Preventive</u> . The number of students admitted to each elective course is limited and admissions are assigned based on objective criteria: personal qualifications, gender-balance, balanced representation of participating countries	Yes	First	The consortium decided that, in order to activate an elective course, a minimum number of students had to demonstrate interest.
10	WP4/ WP5	Lack of local industries to involve in VET and in the Master for the stage (MEDIUM prob. / HIGH imp.)	<u>Preventive/Corrective</u> . The consortium has already contacted some companies (letter of interest); Universities and EREF have their already established network to involve industries; in addition, other stakeholders will be engaged through the WP2	No	N.A.	The consolidated consortium network allowed to have industries, companies, Research centres and other institutions interested in the WP4/WP5 activities. Actual involvement of "replicators" in the replication phase of VET.
11	WP4/ WP5	The stakeholders do not provide adequate and detailed information that is required for comprehensive Segmentation and training needs analysis, and finally for the design of VET education and training contents (LOW prob./ MED imp.)	<u>Preventive/Corrective</u> . Experts/stakeholders (WP2) providing substantial contributions will have fees for their involvement (included in the budget proposal). Stakeholders and experts will be selected based on their activities and engagement in previous projects of partners. If they do not provide adequate and detailed enough information an	No	N.A.	The methodology and actions implemented ensured that the segmentation and training needs analysis was carried out correctly and on schedule.

			ad hoc meeting will be organised.			
12	WP4/ WP5	Incompatibility of different devices and hardware (LOW prob./ MED imp.)	<p><u>Preventive.</u> Preliminary meetings between Unis were held at the beginning of the project in order to have a full list of devices; this will enable them to check the compatibility and to buy the ones really required for the VRX.</p> <p>Since the coordination of the equipment was planned well ahead of the start of the courses (already several specific meetings performed in Nov 2022), the risk is lowered.</p> <p><u>Corrective.</u> If some device is not adequate, a new purchase (or rent) will be done.</p>	No	N.A.	Implementation of preventive actions established in the initial project phase. Moreover, usage of ZapWorks to allow different mobile devices to use the AR mobile game simulators for Energy Management and PV installation (VET).
13	WP5	Constraints connected with training room size (MEDIUM prob./ MED imp.)	<p><u>Preventive.</u> As for VET training interaction between users is recommendable, small groups of 2-3 people will be trained per session. All UNIS has a room to perform the VR training (if not available, the gym will be used).</p>	No	N.A.	We prevented the risk using live online training and AR simulators accessible with mobile devices (smartphone, tablets). In the replication phase we had 2 courses "on-site" in Reggio Emilia, the choice of using the mobile simulators for the practical part allowed us to split participants in groups and using the simulators with their own devices. In this way, we did not need extra space as if we used VR tools.

14	WP6	<p>Poor dissemination outcomes not replicable or exploited (MEDIUM prob./ HIGH imp.)</p>	<p><u>Preventive.</u> An adequate dissemination strategy will be carried out (WP6), in collaboration with all partners to attract the best stakeholders.</p> <p>Further, the outcomes are designed in light of future replication in different settings/regions/countries. Wide dissemination and promotion of exploitable assets is foreseen from the early stage of the project, including, mobilisation and mutual learning workshops and debates and coordination of working groups.</p>	No	N.A.	<p>All project activities and outcomes have been carried out with the aim of developing something replicable, exploitable, and of great impact. Moreover, a comprehensive communication and dissemination strategy, initiated in the early stages of the project and continuing beyond its completion, guarantees widespread dissemination of the results, methodologies, and materials developed.</p>
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Table 5: Monitoring of foreseen Risks

Risk N°	WP	Description	Period when the risk occurred (first/second)	Mitigation/Adaptation Action
15	WP4	Master starts delayed due to administrative problems	First	<u>Corrective</u> . Reduce the duration of the MS (12 months instead of 24 months). This made it possible to deliver the program over two consecutive cycles within the SKILLBILL timeframe.
16	WP4	Change in the Master duration	First	The grant agreement foresees 60 ECTSs and a legal duration of 2 years. However, regulations by UNITUS set a maximum duration of 12 months for 60 ECTS programs. This gave the opportunity to administer the program for two consecutive cycles withing the SKILLBILL duration. This, in turn, will allow: (a) reaching a potentially larger number of students; (b) improving the program after the first cycle. Educational objectives are not varied with respect to the grant agreement, as they are expressed in terms of ECTSs.
17	WP4	Master title responsibility	First	There are significant differences in national regulations relative to master courses in the different countries. Specifically, University of Utrecht could not administer 60 ECTSs masters, while at UNITUS Masters duration must be below 1 year. Organizing a 120 ECTS Master has been considered unfeasible due to the large administrative overhead (more than 18 Months required by Ministry procedures). Moreover, a 120 ECTSs Master would not be coherent with the general objective of the WP to educate professionals in the energy sector. Therefore, we organized a Master program with: a) 1 year duration and 60 ECTSs b) a Level 7 title (according with the European Qualification Framework). The master degree title is awarded by UNITUS, with MET, USE, UU officially supporting the organization of the program as well as the teaching activities.
18	WP4	Low number of students enrolled. At least 40 master students in the last cycle (originally foreseen: 40 students per year)	Second	The participation to the second Master cycle (in the second period) have been increased. Building on the experience of the first cycle, the suggestions from stakeholders and experts, and the synergies with other projects, we put in place a tailored enrolment campaign that included: Advertising through https://studyportals.com/ and other sites, tailored social network posts,

				exploiting partners' networks, involvement of the AB, involvement of projects with synergies in place.
19	WP5	Use of AR instead of VR	First	During the course of the work, it was decided not to proceed with the full VR (virtual reality), visor-based experience originally planned for the course, on the grounds of logistical and practical consideration, and to adopt a different solution in which the VR experience is converted into a mobile-based game, with an embedded AR (augmented reality) experience. To this end, and to ensure that all users can benefit from the same quality of experience regardless of the mobile phone they employ, a specific AR supporting service has been identified and selected on the basis of the best-value-or-money principle
20	WP5	Low participation to synchronous course	Second	To allow more people to take part to training course, an asynchronous version of the VET courses had been created
21	WP5	Low participation of women to VET courses threatens gender-balance KPIs in SKILLBILL courses	First	Selection of courses that may be more attractive for women (e.g. Energy Management, as a management profession attracts both genders). For the ToT we enlarged the definition of "trainers" including also "training managers" and "training designers", these are professions where women are well represented

Table 6: Risks not foreseen in the initial Risk monitoring Plan

The project

SKILLBILL's overall objective is to develop a large and strong foundation for the growth and acceleration of renewable energy's deployment, thanks to engaging with stakeholders of the whole chain, diffusing scientific culture and skilling multi-level workers. The basic idea underlying the project is that the knowledge should be diffused at several different levels and should be qualitatively appropriate to train workers, to increase RES awareness and to reach a more social and inclusive Europe. The project aims at creating several pathways to induce target groups to get interested or involved in RES besides their initial level of education and their working position. It's important, along with the creation of instruments for the upskilling and reskilling of workers, technician and designers, to have awareness modules for unspecified public in order to fight against lack of information and bad quality material on RES, gender gap and the phenomenon of functional illiteracy: it is widely documented that lifelong suitable learning process is the fundamental driver to support the development, maintenance and update of skills. Thus, SKILLBILL proposes concrete actions to accelerate the deployment of renewable energy at different levels to analyse and involve all the interested parts in open discussion using adequate language; create several different pathways to increase skills after having mapped knowledge gap and without gender prejudice; develop and implement innovative learning method; and evaluate the work performed.



Coordinator: **AZZERO CO2 SRL (AzzeroCO2)**

PARTNER	SHORT NAME	
	AZZERO CO2 SRL	AzzeroCO2
	Q-PLAN INTERNATIONAL ADVISORS PC	Q-PLAN
	WHITE RESEARCH SPRL	WR
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	UNIVERSIDAD DE SEVILLA	USE
	METROPOLIA AMMATTIKORKEAKOULU OY	METROPOLIA
	UNIVERSITEIT UTRECHT	UU
	EUROPEAN RENEWABLE ENERGIES FEDERATION	EREF
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