

COoperative Cyber prOtectiOn for modern power grids

D10.5 Risk Analysis – Version 2

Distribution Level	PU						
Responsible Partner	UCY						
Prepared by	Irina Ciornei, Angelos Marnerides, George						
	Kryonidis, Alex Stefanov, Fotios Fotellis, Viktor						
	Papadopoulos, Elvira Sanchez Ortiz, Luna						
	Morena Diaz						
Checked by WP Leader	Angelos Marnerides (UCY)						
Varified by Paviawar #1	Charis Demoulias (AUTH)						
Verified by Reviewer #1	13/03/2025						
Verified by Reviewer #2	Kyriaki-Nefeli Malamaki (AUTH) 13/03/2025						
Approved by Project Coordinator	Angelos Marnerides (UCY)						
Approved by Project Coordinator	15/03/2025						



Co-funded by the European Union



Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Directorate General for Communications Networks, Content and Technology. Neither the European Union nor the Directorate General for Communications Networks, Content and Technology can be held responsible for them.

Deliverable Record

Planned Submission Date	17/03/2025
Actual Submission Date	14/03/2025
Status and version	FINAL

Version	Date	Author(s)	Notes
0.1	28/02/2025	Irina Ciornei (UCY),	ToC, Initial Structure – Inclusion of Input by all
(Draft)		Angelos Marnerides	Partners
		(UCY)	
0.2			
(Draft)	8/03/2025	George Kryonidis	Contributions to all chapters
		(AUTH), Angelos	
		Marnerides (UCY), Irina	
		Ciornei (UCY), Alex	
		Stefanov (TUD), Fotis	
		Fotellis (HEDO), Viktor	
		Papadopoulos (SEL),	
		Elvira Sanchez Ortiz	
		(ENCS), Luna Morena	
		Diaz (Ingelectus)	
0.3	11/03/2025	Irina Ciornei (UCY)	Comments and contributions to 1st complete draft
			over reviewed risks
0.4	13/03/2025	Maria Michael (UCY)	Comments on the 2 nd complete draft
0.5	13/03/2025	Charis Demoulias	Final Review comments
		(AUTH), Angelos	
		Marnerides (UCY),	
1.0	14/03/2025	Angelos Marnerides	Final quality check for submission
(Final)		(UČY)	× ~



Table of contents

Definition of Acronyms	4
Executive Summary	5
1. Introduction	6
2. Risk analysis	7
2.1 Risk Identification	7
2.2 Risk analysis and monitoring	7
2.3. COCOON risk analysis updates	8
3. Conclusion1	13
Annex1	14

Definition of Acronyms







Executive Summary

The purpose of this deliverable is to reevaluate and update the first version of risk analysis of the COCOON Project (D10.2) based on the implementation progress within the half term of the project (M1-M18). The methodological process of the risk assessment remained the same and the monitoring tool for the risk assessment in COCOON project, which was detailed as part of D10.2 has been used as the main instrument for producing this report. Specifically, it is to be highlighted that the same risk quantification method used in the proposal-phase and further elaborated in D10.2 remained applicable. However, this report tried to focus on the possible risks considering the detailed breakdown of each work package implementation at task and sub-task level and propose mitigation actions for the reduction or elimination of the risks.

All identified risks were assessed at WP leading level as well as Project Management level, and mitigation actions were proposed for the reduction or elimination of the risks. In general, this document is consistent with the Grant Agreement (GA) terms and conditions, its Annexes, and Amendments, as well as the Consortium Agreement (CA) specifications and requirements. This updated risk analysis ensures the continuation of observing higher assurance is provided on i) full understanding of the risks and possible obstacles the partners might face in the upcoming phase of project implementation when carrying out their project tasks and ii) foster stronger collaboration among the consortium members, individuals, and groups so that these risks are mitigated. Finally, the second version of the Risk Analysis (D10.5) along with the previous version (D10.2) are intended to be utilized by the project coordinator, the WP leaders and Task Leaders for the continuous monitoring and control of the identified risks and appropriately apply mitigation actions if and when necessary.

Based on the updated analysis, the risk management efforts so far have proven effective in maintaining vigilance over the project's potential vulnerabilities within this half term of the project implementation. The fact that most risks have remained consistent, while the additional risks identified are basically fine granularity of those initially stated at subtask level, indicates that our initial assessment was accurate and that our mitigation strategies have been successful so far in preventing the materialization of these risks. Moving forward, we will continue to monitor and manage all risks to ensure the successful completion of the project, and this process and outcomes will be reported in the 3rd update of Risk Analysis of COCOON (D10.6 - M27).



1. Introduction

As with every Research and Innovation project, COCOON includes uncertainties within the planned implementation strategy and has to cope with these uncertainties to a greater or lesser extent. As part of the first version of the Risk Analysis for COCOON (D10.2), the methodology for the risk monitoring, management and analysis has been detailed and a risk monitoring tool had been created as an instrument to be used by all WP leaders and the project coordinator alike when supervising the implementation of the project tasks and subtasks by each involved partner. Furthermore, in this initial version, COCOON consortium has identified and quantified some risks, based on the experience gained during the early stages of the project implementation.

Using the approach followed in D10.2 and the more mature experience gained in the last 18 months of the project, those risks are updated in this report, and they are detailed at a finer granularity level (e.g., task and sub-task level). In some cases, the risks identified in D10.2 remained the same.

This risk management process, remain an integrated part of the overall project management approach, as detailed in the previous deliverables, D10.1 (Project management plan (PMP) – version 1) and D10.4 (PMP – version 2) and it will continue to be assessed throughout the project's lifecycle and reported appropriately in other upcoming deliverable D10.6 (Risk Analysis - version 3).



2. Risk analysis

For the consistency and self-reading of this report we summarize the risk management framework used in the COCOON project. This framework consists of three main pillars that continually interact and correlate: (i) risk identification, (ii) risk analysis and monitoring, and (iii) risk handling. This risk management process was aligned with the project's objectives and its management procedure was established at the early stages of the project implementation (see D10.2) and it will accompany it throughout its lifecycle.

2.1 Risk Identification

The risk identification phase focuses on uncovering risks before they turn into problems. This is an iterative process which also includes the identification of possible causes and consequences. Participants in risk identification include subject-matter experts, WP leaders, the Innovation & Intellectual Property Manager (IIPM), the Technical Manager (TM), and the Project Coordinator (PC). For all identified risks, efficient contingency plans (resource reallocation, fallback, contingency measures) will be implemented immediately.

The process of identifying potential risks that could impact the project's success began during the proposal phase. The initial critical risks were documented and categorized into three groups: (i) technical, (ii) business, and (iii) management. This classification was conducted to ensure that the most relevant consortium members were assigned to closely monitor and mitigate the corresponding risks.

The process of identifying any further potential risks besides those listed in the previous and current version of the risk analysis still remains an ongoing process such that to ensure constant vigilance. In COCOON, the WP leaders act as risk managers for their respective WPs. As experts in their fields, the WP leaders are best equipped to identify and address any risks that may arise.

2.2 Risk analysis and monitoring

The <u>risk analysis</u> in COCOON involves evaluating the risk attributes, and prioritizing (ranking) the risks. Evaluating risk attributes involves establishing values for probability (i.e., likelihood the risk event will occur) and the impact (i.e., estimation of the consequence of a risk in terms of significance for the project). The risk probability can be defined, determined, measured objectively or subjectively and can be expressed either qualitatively or quantitatively. The probability may be dependent on various factors like the project environment, consortium characteristics, external effects, technological breakthroughs etc. On the other hand, the possible impact and its level of severity define the effects and consequences the COCOON project may face in case of risk occurrence. The impact may be influenced by various risk triggers arising from the project environment, consortium characteristics, external effects, technological breakthroughs among others. In addition, it may affect the technological and financial performance as well as the schedule of the project.

Probability (Prob)	Qualitative Impact (Im)
01 - 20 % = Remote (R)	1 = Insignificant
21 - 40 % = Unlikely (UL)	2 = Minor
41 - 60 % = Likely (L)	3 = Moderate
61 - 80 % = Highly Likely (HL)	4 = Major
81 – 99 % = Near Certainty (NC)	5 = Catastrophic

COCOON implements the scoring system provided in Table. *1* below.

Table. 1 COCOON risk scoring system



2.3. COCOON risk analysis updates

Through the second round of assessment between M7-M18, the WP leaders and the PC has analysed and refined specific risks as originally described in the GA and in deliverable D10.2 (Risk Analysis – 1^{st} version). The updated version of the initial list of risks and mitigation actions for each WP is presented in Table. 2. This list is the basis for the continuous monitoring of the project execution by each WP leader and it is discussed on each Project Management Board (PMB) meeting in order to ensure timely identification of possible materialization of these risks and application of mitigation actions (if the case requires).

WP1 risks & reviews			
Risk	Im	Prob	Contingency Plan
R1.1 Refinement of PDP-EEs for network primitives not compatible with vendor hardware.	4	R	Partners have already developed such algorithmic system modules for Industrial IoT setups in programmable networked devices. Further, recent preliminary tests on the selected COCOON node hardware passed successful. Thus, we consider the probability of this risk to be low. In the remote event, alternatives through the P4 language will be considered as alternative.
R1.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.			R1.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R1.2 Orchestration of SFCs for synthesis of μ NFs not optimal in terms of network performance.	3	UL	Members have already implemented orchestration frameworks over ETSI NFV MANO applicable for resource- constrained IoT devices and recently tested these functionalities in lab environment tests. Thus, we consider the probability of this risk to remain very low.
R1.2 review: same as the review R1.1			R1.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R1.3 Graph-based provenance composition for risk profiling not computationally effective	3	R	Partners have implemented such approaches in the context of ICS and IoT botnet profiling. Recent updates and tests of the initial version of this module were computationally manageable. Thus, we assess the probability of this risk to remain at low levels. If it however occurs at the pilot stage deployments and tests, partners will consider integrating other standardized OSINT data-driven APIs.
R1.3 review: same as the review R1.1			R1.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R1.4 DL-based cyber-physical diagnosis not optimal or functional.	3	UL	Partners have developed such schemes in the context of energy systems for aggregators and also for digital IEC 61580 substations. In the unlikely event partners will not utilize the synthesis of CNN and LSTM but will integrate alternative DL formulations such as RNNs.
R1.4 review: same as the review R1.1			R1.4 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R1.5 No cyber threat intelligence (CTI) is available for power grids.	3	UL	We will use publicly available data from ENISA and ENCS. ENISA provides a sector specific threat landscape. Furthermore, we will use vulnerability information reported publicly in CVE.
R1.5 review: same as the review R1.1			R1.5 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
WP2 risks & reviews			
Risk	Im	Prob	Contingency Plan
R2.1: State estimation methodology shows large inaccuracies when the used	3	UL	The minimum required raw data for given accuracy will be derived based on accuracy-vs-amount of data analysis. If the



raw data are below the initially anticipated amount.			additional data proves to pose a high computational burden and jeopardize the real-time performance of the system, model-predictive methods will be introduced for state estimation.
R2.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.			R2.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same.
R 2.2: State estimation presents low accuracy when applied in PV plants	3	UL	Additional security layers (e.g. Hellingers distance, Benford's law) will be introduced to compensate the reduced accuracy of state estimation.
R2.2 review: same as the review R2.1			R2.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R2.3: Tailoring the generic false data injection identification methodology to Energy Communities leads to increased computational burden and/or low accuracy	3	UL	The provision of ancillary services from the Energy Communities will be used as an additional insight toward the implementation of the proposed solution to further increase the accuracy and/or reduce the computational burden.
R2.3 review: same as the review R2.1			R2.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R2.4: The proposed real-time protection cannot meet the time latency requirement in digital substation.	4	UL	Prepare several test case scenarios for the real-time protection application in the digital substation.
R2.3 review: Python application failed to meet time requirements. The problem was solved by implement the application using C++.			R2.4 contingency plan review: the contingency plan was applied successfully: The problem was solved by implement the application using C++.
WP3 risks & reviews			
Risk	Im	Prob	Contingency Plan
Risk R3.1: Mismatched configuration of COCOON solutions	Im 3	Prob UL	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.	Im 3	Prob UL	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions. R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.	Im 3 4	Prob UL UL	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions. R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same. Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real- Time (RT) simulator.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.R3.2 review: RT-Lab, OPAL-RT IDE, was reconfigured in January 2025 and there was no access to the models and simulation in real time. This was solved with an update of the IDE.	Im 3 4	Prob UL UL	Contingency PlanCOCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions.R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same.Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real- Time (RT) simulator.R3.2 contingency plan review: The contingency plan was applied successfully: It was solved with an update of the IDE.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.R3.2 review: RT-Lab, OPAL-RT IDE, was reconfigured in January 2025 and there was no access to the models and simulation in real time. This was solved with an update of the IDE.WP4 risks & reviewsBiel	Im 3 4	Prob UL UL	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions. R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same. Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real- Time (RT) simulator. R3.2 contingency plan review: The contingency plan was applied successfully: It was solved with an update of the IDE.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.R3.2 review: RT-Lab, OPAL-RT IDE, was reconfigured in January 2025 and there was no access to the models and simulation in real time. This was solved with an update of the IDE.WP4 risks & reviewsRiskR4 1: Low loval, COMML, and IOL	Im 3 4 Im	Prob	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions. R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same. Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real-Time (RT) simulator. R3.2 contingency plan review: The contingency plan was applied successfully: It was solved with an update of the IDE. Contingency Plan Partners already Partners already
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.R3.2 review: RT-Lab, OPAL-RT IDE, was reconfigured in January 2025 and there was no access to the models and simulation in real time. This was solved with an update of the IDE.WP4 risks & reviewsRiskR4.1: Low-level COMML and IOL modules do not optimally interface.	Im 3 4 J Im 3	Prob UL UL Prob R	Contingency PlanCOCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions.R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same.Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real- Time (RT) simulator.R3.2 contingency plan review: The contingency plan was applied successfully: It was solved with an update of the IDE.Contingency Plan Partners already have prototypes interfacing such functionalities and the risk is remote. In case of the remote risk event, standardized NFV frameworks will be employed to achieve such functionalities.
RiskR3.1: Mismatched configuration of COCOON solutionsR3.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.R3.2: Dependency of the OPAL-RT for real time simulations of PV plant and Energy Community, affecting both T3.1 and T3.2.R3.2 review: RT-Lab, OPAL-RT IDE, was reconfigured in January 2025 and there was no access to the models and simulation in real time. This was solved with an update of the IDE.WP4 risks & reviewsRiskR4.1: Low-level COMML and IOL modules do not optimally interface.R4.1 review: This aspect has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.	Im 3 4 Im 3	Prob UL UL Prob R	Contingency Plan COCOON innovations will be revised, tested and validated by technical experts, ensuring and controlling the potential unsuitably matches on the COCOON solutions. R3.1 contingency plan review: This risk has been re-assessed by the WP partners and its contingency plan remains the same. Develop the model of the PV plant and Energy Community in Typhoon-HIL (hardware in the loop) as an alternative Real- Time (RT) simulator. R3.2 contingency plan review: The contingency plan was applied successfully: It was solved with an update of the IDE. Contingency Plan Partners already have prototypes interfacing such functionalities and the risk is remote. In case of the remote risk event, standardized NFV frameworks will be employed to achieve such functionalities. R4.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.



software development and delaying TRL increase.			In case of unfortunate delays, an Agile development process will be implemented to reduce the timeframes between building the repository and testing it.					
R4.2 review: This aspect has been discussed and the DevOps process has already been deployed up to M6 – the setup for software blackbox testing has been established and tests of the COCOON will be supported by Continuous Integration (CI) and Continuous Development (CD) automated pipelines. Blackbox testing might be affected but with appropriate adjustment of automation tools it will be easily fixed. The risk was UL and now is R and contingency plan refined.	3	R	R4.2 new contingency plan: If blackbox testing is not effective, re-adjustment of CI/CD pipelines will be conducted.					
WP5 risks & reviews	Tur	Dest	Continuous Dia					
R5.1: Configuration for AS emulation with the IKE setup is not functioning.	3	R	Contingency Plan Partners have implemented similar services for interfacing with DRES deployments within a previous H2020 project, gaining credible implementation experience. In the extremely unlikely event, conventional cloud IIoT routines will be employed.					
R5.1 review: this risk has been re- assessed by the WP partners and it remains the same.			R5.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.					
R5.2: The energy community has financial loss during the experimental phases.	3	UL	This is a risk that is unlikely to occur since the experiments will include segregated AS instrumentation over the network without affecting all PV installations However, in the first stage of the experiments, the AS tests will be focused and related to reactive power, which does not result in revenue losses.					
R5.2 review: this risk has been re- assessed by the WP partners and it remains the same.			R5.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.					
R5.3: Cyber-attack emulations through HEDNO's main SCADA system, which controls and provisions all remote units in Greece.	4	L	HEDNO needs to purchase a license for a database. If this database is incorporated into HEDNO's device, the SCADA Data Gateway (SDG), it will be capable of emulating functions similar to those of a SCADA system.					
R5.3 review: HEDNO has purchased the license and is now implementing SCADA functionalities within the database.			R5.2 contingency plan review: The contingency plan was applied successfully					
R5.4: CPN is not compliant with HEDNO's equipment, it will be difficult to integrate Cocoon solutions in HEDNO's system.	2	UL	UGLA discussed this risk with HEDNO and decided to integrate the CSL Layer into the SDG. Additionally, the CPN will be a device compliant with HEDNO's equipment.					
R5.4 review: CPN must be a device that operates with HEDNO's equipment, and some of its functionalities may need to be integrated into HEDNO's SDG.			R5.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same					
WP6 risks & reviews		1	F					
Risk R6.1: Data related to South-East Europe grid stability processes are exposed publicly.	1m 4	Prob R	Contingency Plan This is a quite unlikely event, since all data will be anonymized and compliant to GDPR during processing and presentation of results.					
R6.1 review: this risk has been re- assessed by the WP partners and it remains the same.			R6.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.					
R6.2: Experimentations interface with critical SEL operations.	3	R	This is quite unlikely since all experimentations and trials will be built with appropriate segregation properties.					



R6.2 review: this aspect is now not related at all since experimentations will be conducted in a completely independent and setup that replicates the actual SEL operations. Hence this risk is not applicable and will not be included in next risk analysis.	N/A	N/A	No contingency plan since this risk will not be considered anymore.
Pick	Im	Proh	Contingency Plan
R7.1: Relevant DSO team is not available to attend the training sessions	3	UL	Partners will engage in the first year of the project with all DSOs in the consortium. We will plan and schedule the training sessions with all DSOs well in advance. In case one DSO team is not available, we have 2 other DSO teams to run the training sessions.
R7.1 review: this risk has been re- assessed by the WP partners and it remains the same.			R7.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R7.2: Unexpected problems with the implementation / operation of the solutions at demo-site	3	UL	Initial effort and planning will be placed during the first phase of the demonstration campaign to develop comprehensive deployment and monitoring plans. This will mitigate the risk of later difficulties implementing the solutions and tools. Potential risks will be first analysed in under laboratory conditions and through the digital twin.
R7.2 review: this risk has been re- assessed by the WP partners and it remains the same this aspect will be validated post M12.			R7.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
WP8 risks & reviews			
Risk	Im	Prob	Contingency Plan
the CPN is not functioning.	3	R	Partners have already implemented routines for interfacing SBCs with Internet-enabled PV installations and the risk is remote. In the unlikely event, the SBCs will couple with the firewall serving these installations.
R8.1 review: this risk has been re- assessed by the WP partners and it remains the same since this aspect will be validated post M12.			R8.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R8.2: Experimentation affects the PV plants generation reporting and AS instrumentation.	3	UL	The WP8 pilot setup has already been fully designed to have stable networking capabilities that can be used as alternatives in scenarios where AS instrumentation is impacted. The interface with CPNs will be based on standard protocols, thus this scenario is unlikely.
R8.2 review: R8.1 review: this risk has been re-assessed by the WP partners and it remains the same since this aspect will be validated post M16.			R8.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R8.3: Unavailability of the plant for a reason external to the project (TSO curtailment, equipment failure, etc.), preventing to carry out cyber-attack tests.	3	UL	 Reschedule cyber security testing in the event of plant unavailability. Resolve equipment failures or problems that prevent normal plant operation as quickly as possible, in close coordination with the site manager, CUE.
R8.3 review: this risk has been added to the original list. The assessment of this risk will be relevant when the cyber- attack tests are performed in the plant.			R8.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R8.4: Delay in the CPN final deployment	4	UL	Continuous monitoring of the implementation of the CPN by the UGLA team and good coordination and planning of the installation of the CPN on site between UGLA-CUE-ING.
R8.4 review: this risk has been added to the original list.			R8.4 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
WP9 risks & reviews			



Risk	Im	Prob	Contingency Plan
R9.1: Project facing technology replacement issues; project results become obsolete	3	UL	The project will be engaged in a continual technology watch effort through its interface with the scientific community, which will last till the very end of the project throughout all WPs. This risk will be met by involving all research partners of the project into design tasks ensuring that designs are kept in line with the most advanced developments.
R9.1 review: this risk has been re- assessed by the WP partners and it remains the same.			R9.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R9.2: Consortium ability to disseminate and exploit project knowledge	4	UL	The variety of partner backgrounds and their roles across the various levels of power transmission, distribution and aggregation include a large network of stakeholders that will ensure dissemination across the energy sector at an EU-wide level.
R9.2 review: this risk has been re- assessed by the WP partners and it remains the same.			R9.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
General Management (WP10) risks & rev	views		
Risk	Im	Prob	Contingency Plan
R10.1 Some partners with responsibilities in a certain WP leave the project.	4	R	COCOON is internally capable of restributing the work among the remaining partners. This would eventually require partners to hire missing resources.
R10.1 review: this risk has been re- assessed by the WP partners and it remains the same. A new partner (UCY) was added following an amendment and the risk remains with the same score.			R10.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R10.2 Consortium partners cannot agree because of different interests.	4	UL	The studied project management structure foresees clear conflict resolution and decision procedures to resolve this quickly.
R10.2 review: this risk has been re- assessed by the WP partners and it remains the same.			R10.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R10.3 Research and development gets into a sidetrack due to unclear vision and goals.	4	UL	Short catch-up sessions between WP leaders and the TM will be in place twice a month to prevent such issues. T10.4 is purposedly designed to establish clear pathways for the technical work in advance.
R10.3 review: this risk has been re- assessed by the WP partners and considered the change to a new coordinator (UCY). The risk remains the same as before.			R10.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.
R10.4 Risk of partners not delivering cost estimates and deliverables on time.	2	L	Internal deadlines within the consortium are set well before the defined deadlines. Also, names and contact information of responsible research persons, financial persons and legal persons are collected from each partner, reminders will be sent before the internal deadlines.
R10.4 review: this risk has been re- assessed by the WP partners and it remains the same.			R10.4 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.

Table. 2 Updated COCOON's risks and risk reviews



3. Conclusion

This deliverable assessed the effectiveness of the risk management process which was provided as part of the initial version of the Risk Analysis (D10.2). The initial risk analysis framework along with the risk monitoring and assessment tool for the COCOON project proved so far to be successful instruments which facilitates the successful project delivery in the research and innovation sphere. Specifically, this report has re-examined the initial risks, added few other finer granularity risks aligned with the WPs breakdown in tasks and subtasks based on the experience gained during the first half of the project implementation. Mitigation actions for the reduction or elimination of these risks have also been proposed.

In summary, the consistency of initially identified risks complemented with finer granularity risks and their contingency plans suggests that our initial assessment was accurate, and mitigation strategies have proved to be effective in fewer mitigation actions taken, when some of the risks materialized.

Annex

The Fig. 1 below shows a sample of the Risk Assessment tool which was used as part of the COCOON Risk analysis process and updates.

Risk Evaluation Form						Current assessment of risk								ONLY if the risk materialised		
Risk Nr.	Responsible Partner	Description of risk	Category (Technical /Business/ Managem ent)	Proposed Contingency plan (Avoid – Reduce – Contingency – Transfer – Accept – Share)	Date of last evaluatio n	a) Is the risk still relevant? (Yes/No)	b) Probabilit y How likely will the risk occur?	c) Severity/ Impact	d) Did the risk materialis e? (Yes/No)	e) Please provide a short update of the risk: (e.g.: What has happened? , Why is it (not) relevant at the moment?, etc.)	I) Did you <u>apply</u> risk mitigatio n measures ? (Vas/Mo)	g) If the risk-mitigation measures couldn't/werent't be applied, please explain why.	h) Explain the reason why it materalised	i) What are the consequences? Delay of Dxy, delay of task xy, shift of resources, impact on other WPs, etc.	j) What are the corrective actions & updated mitigation measures?	
R2.1	AUTH	State estimation methodology shows large inaccuracies when the used raw data are below the initially anticipated amount.	Technical	The minimum required raw data for given accuracy will be derived based on accuracy-vs-amount of data analysis. If the additional data proves to pose a high computational burden and jeopardize the real-time performance of the system, model-predictive methods will be introduced for state estimation.	4/3/2025	Yes	UL	3	No	R2.1 review: This objective has been assessed by the WP leader and its corresponding risk verified to remain as originally proposed adhering to the original contingency plan.	No	R2.1 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.				
R2.2	USE	State estimation presents low accuracy when applied in PV plants	Technical	Additional security layers (e.g. Hellingers distance, Benford's law) will be introduced to compensate the reduced accuracy of state estimation	4/3/2025	Yes	UL	3	No	R2.2 review: same as the review R2.1	No	R2.2 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.				
R2.3	AUTH	Tailoring the generic false data injection identification methodology to Energy Communities leads to increased computational burden and/or low accuracy	Technical	The provision of ancillary services from the Energy Communities will be used as an additional insight toward the implementation of the proposed solution to further increase the accuracy and/or reduce the computational burden.	4/3/2025	Yes	UL	3	No	R2.3 review: same as the review R2.1	No	R2.3 contingency plan review: this risk has been re-assessed by the WP partners and its contingency plan remains the same.				
4.0		The proposed real-time protection		Prepare serveral test case scenarios for the						Python application was fail to meet time requirement. The		R2.4 contingency plan review: this risk has been re-assessed by				
>	= WP	1 WP2 WP3 WP4	WP5	WP6 WP7 WP8 WP9 WP	10 +											

Fig. 1 Sample of the COCOON Risk Assessment TOOL