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FlexSNG

Deliverable D1.2

Quality Assurance Plan (QAP)

Dissemination level: Public

Due date: 31/08/2021

Grant Agreement (GA) No. 101022432

Research and Innovation Actions (RIA) project

Granted by: Climate, Infrastructure and Environment Executive Agency (CINEA)

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Document Control Sheet

Project	FlexSNG - Flexible Production of Synthetic Natural Gas and Biochar via Gasification of Biomass and Waste Feedstocks		
Call/Topic	International cooperation with Canada on advanced biofuels and bioenergy		
Type of action	Research and Innovation Action (RIA)		
Grant Agreement No	101022432		
Start date	01/06/2021	Duration	36 Months
Project Coordinator	VTT Technical Research Centre of Finland Ltd		

Work Package No	WP1	Task No	Task 1.3
Due date (in months)	Month 3		
Actual submission date	20/12/2021		

Lead Beneficiary	VTT	
Contributor(s)		
Dissemination level	Public	x
	Confidential, only for members of the consortium (including the Commission services)	

Revision history

Version	Date	Modification	Author
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1.1	19.08.2021	Preliminary version for initial review	Minna Kurkela, VTT
2.0	24.08.2021	Revised draft	Sanna Tuomi, VTT
2.1	27.08.2021	Final quality check	Sanna Tuomi, VTT
2.2	20.12.2021	Disclaimer added, acknowledgement sentence updated	Minna Kurkela, VTT

Disclaimer

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Table of Content

Abbreviations and acronyms

AG	Administration Group
CA	Consortium Agreement
CINEA	European Climate, Infrastructure and Environment Executive Agency
D	Deliverable
DoA	Description of Action
EC	European Commission
ExC	Exploitation Committee
ExM	Exploitation Manager
GA	General Assembly
IM	Innovation Manager
LPM	Local Project Manager at each partner organisation
M	Month
PC	Project Coordinator
PO	Project Officer
QAP	Quality Assurance Plan
WP	Work Package
WPL	Work Package Leader

1 Executive summary

This deliverable (D1.2 Quality Assurance Plan, QAP) describes the quality assurance principles applied within the FlexSNG project. Quality assurance is an essential part of successful project implementation and management. One of the targets of quality assurance is to ensure the conformity and high quality of project deliverables, reports and publications. Risk management is also an integral part of quality assurance; it aims to make sure that the consortium manages to fulfil the project objectives and goals on time and within the budget frame. If deviations occur, risk management procedures and contingency plans will be put in place to minimise the negative impact on the project implementation. The General Assembly (GA) together with the Project Coordinator (PC) monitor that the quality assurance principles defined in this deliverable are properly implemented in all activities of the project.

The objective of this QAP is to provide the project participants with a common framework of guidelines, procedures and templates that is needed to complete the project outcomes and objectives following a uniform approach and prevent possible deviations from the project work plan. The QAP comprises the following items:

- Governance structure of the project and definition of roles and responsibilities of project participants (incl. consortium contact information)
- Guidelines for effective communication and information exchange within the consortium through meetings, active e-mail exchange etc.
- Instructions for project reporting, including procedures for internal peer-review of deliverables and periodic reports and document templates
- Guidelines for risk management and associated contingency plans
- Procedures for innovation management and conflict resolution
- Measures to promote gender equality in the project

The QAP is based on the terms and conditions established in the Grant Agreement (GA) and its Annexes, as well as in the Consortium Agreement specifications.

2 Introduction

The Quality Assurance Plan (QAP, deliverable D1.2) outlines the quality assurance principles adopted by the FlexSNG project. The QAP is produced in the context of Task 1.3 “Quality assurance and risk management”.

The purpose of this deliverable is to describe the procedures and guidelines that the project participants will implement throughout the project to ensure the highest level of quality in all project outcomes and reports and to accomplish the expected milestones and project results within the timeline set out in the Description of Action (DoA). The QAP provides guidelines for documentation of project activities and reporting, monitoring of work progress, approval and submission of deliverables, communication and information exchange within the consortium, risk and innovation management, conflict resolution and gender equality issues. The QAP also describes the project governance structure and defines the roles and responsibilities of project participants.

3 Governance structure

The governance structure of FlexSNG is shown in Figure 1. The management of the consortium is carried out by the Project Coordinator (PC) and the General Assembly (GA). The GA, which was elected at the kick-off meeting, consists of one member from each partner and is responsible for strategic project decisions. The Administration Group (AG) assists the Coordinator in operational management. Exploitation Committee (ExC) acts as an advisory body providing guidance to the GA. It consists of the Exploitation Manager and one representative from each partner. The ExC is in charge of innovation management and coordinates the exploitation of project results during and after the project. The day-to-day management of the project is carried out by the Coordinator and the partners leading individual work packages.

The roles and responsibilities of the Coordinator and the consortium bodies are defined in the Grant Agreement and the Consortium Agreement (based on DESCA 2020).

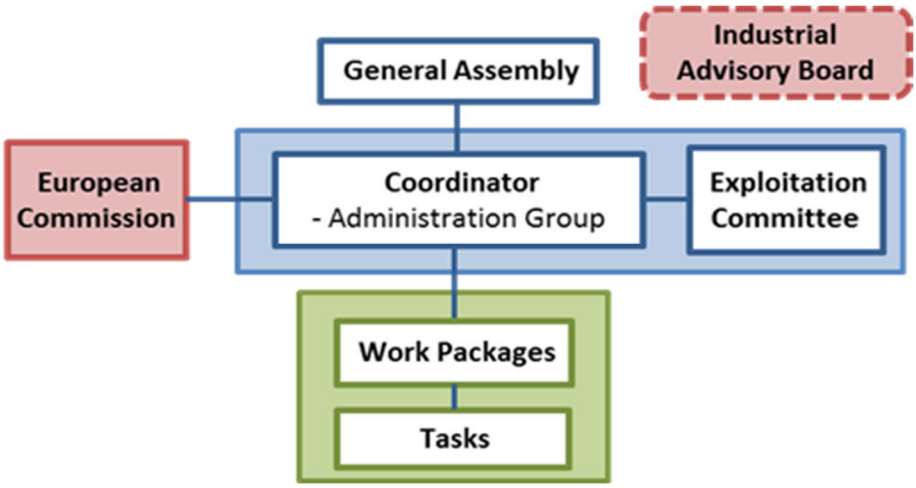

Figure 1.Organisational structure of FlexSNG.

3.1 Project Coordinator

The FlexSNG project is coordinated by VTT Technical Research Centre of Finland Ltd. VTT takes care of the administrative, financial, technical/scientific and organisational management of the project and acts as the intermediary between the participants and the European Commission (EC). The main responsibilities of the Project Coordinator (PC) together with the Administration Group (AG) are as follows:

- Overall project management;
- Communication between the project and the CINEA office;
- Preparation of GA meetings and decisions;
- Preparation of statements from partners (including financial audit certificates) for transmission to the CINEA office;
- Ensure prompt delivery of all hardware, software and data identified as deliverable items in the contract or requested by the CINEA office for reviews and audits (including the results of financial audits prepared by independent auditors).

The Project Coordinator, Sanna Tuomi from VTT, is responsible for the day-to-day administrative and scientific coordination of the project as well as for organizing communication between the partners (usually to occur via Work Package Leaders) and consolidating project planning. The PC is the single point of contact between CINEA (Project Officer, PO) and the consortium and communicates all project-related information between the CINEA office and the project participants. The Administration Group (incl. financial and legal officers, administrative manager) assists the Coordinator in operational management. The AG provides support to all partners in financial and administrative issues, and collects/resolves all open issues concerning management reports, cost statements and audit certificates. The correct distribution and accounting of the EC payments is also part of their activities.

The Coordinator is also supported by the Scientific/Technical Manager (Ilkka Hiltunen, VTT) and the Exploitation Manager (Juha Palonen, SFW). The Scientific/Technical Manager provides assistance in technical decision-making during the project execution and supports in technical monitoring and review/approval of technical deliverables to fulfil the quality requirements set for project documentation. The Exploitation Manager coordinates the project activities that aim for rapid market uptake: exploitation, market/industrial dissemination and IPR issues.

The Coordinator is also responsible for keeping a list of project contact information up-to-date and accessible to all partners. Consortium contact information is given in Appendix 1, while a more detailed contact list (incl. telephone numbers) is available in FlexSNG Teams workspace.

3.2 General Assembly

The project is governed by the General Assembly (GA). The GA comprises one representative from each participant and is chaired by the Coordinator. It acts as the

ultimate decision-making body in the project. The GA will meet at least twice a year in conjunction with the consortium meetings. The GA is responsible for:

- Supporting the Project Coordinator in the fulfilment of obligations vis-à-vis the CINEA office;
- Ensuring that all work meets functional requirements;
- Reviewing and proposing project budget transfers in accordance with the contract and any revisions to the implementation plan;
- Monitoring the project budget in accordance with the contract (including the project plan where necessary), reviewing and proposing budget transfers to the partners;
- Agreeing on press releases and publications drawn up by the partners with regard to the project;
- In instances of partner default: Agreeing on action to be taken against the defaulting partner (including the submission of a request to the CINEA office for an audit or assistance), making proposals to the other partners regarding the reassignment of the defaulting partner's tasks, coordinating the invitation of a new entity to join the project for the fulfilment of those tasks (where applicable);
- Reporting major changes in work packages;
- Managing conflicts.

The GA is free to act on its own initiative to formulate proposals and take decisions in accordance with the procedures stated in the Consortium Agreement. The General Assembly shall not deliberate and decide validly unless two-thirds (2/3) of its members are present or represented (quorum). Each member present or represented in the meeting shall have one vote. Decisions shall be taken by a majority of two-thirds (2/3) of the votes cast.

The procedure for internal reporting from task level to GA level is depicted in Figure 2.

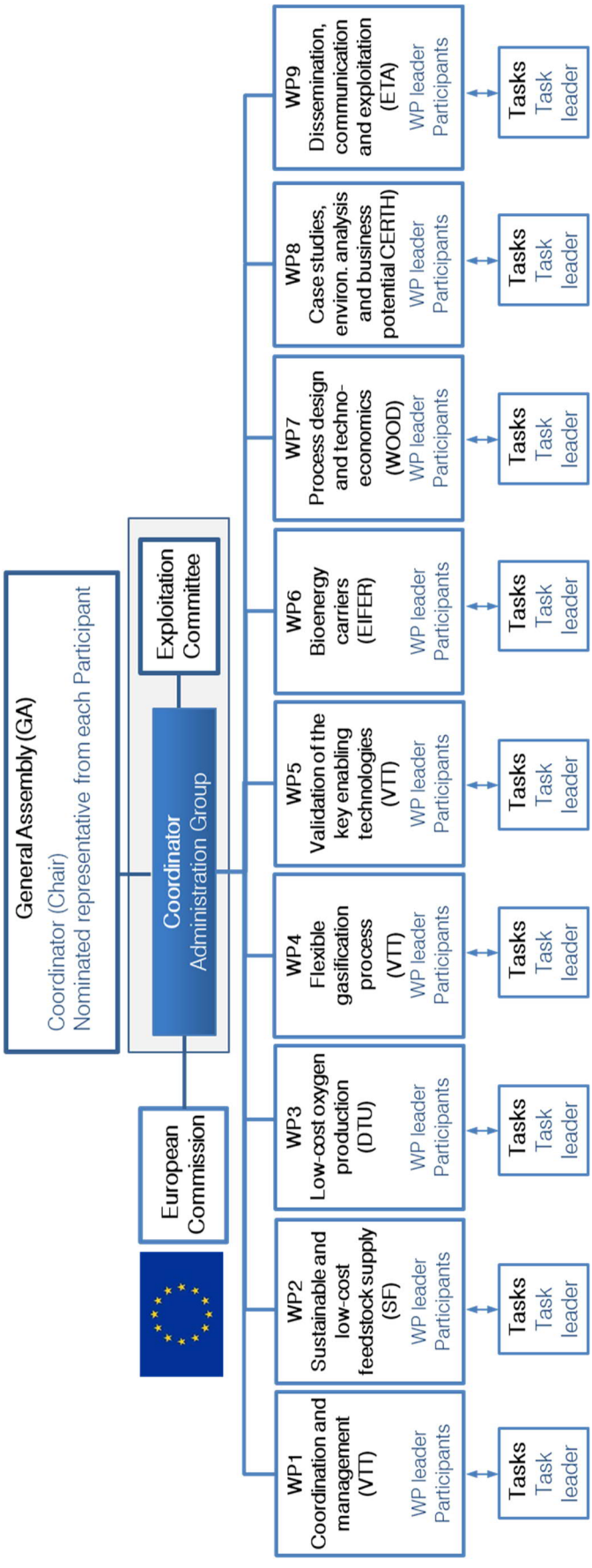

Figure 2. Internal reporting procedure from task level to GA level.

3.3 Work Package Leaders and Task Leaders

The Coordinator and the Work package leaders (WPLs) are responsible for the proper execution and implementation of the decisions of the GA. Work Package Leaders (Table 1) are in charge of their respective WPs and report to the Coordinator and the GA. The WPLs monitor effective implementation of their respective work packages and together with the Coordinator ensure that necessary actions are executed to accomplish the planned objectives and impacts, and if necessary, propose modifications to the work plan (that will be handled by the GA).

Task Leaders manage their respective tasks, perform technical follow-up and coordinate activities that are interrelated with other tasks within the work package. The main responsibility of the Task Leaders is to ensure a timely completion of their tasks. Task Leaders report directly to the Work Package Leaders.

Table 1. Work Package Leaders.

No.	WP name	WP Leader	Country
1	Coordination and management	VTT, Sanna Tuomi	Finland
2	Sustainable and low-cost feedstock supply	SF, Anders Eriksson	Sweden
3	Low-cost oxygen production	DTU, Wolff-Ragnar Kiebach	Denmark
4	Flexible gasification process	VTT, Sanna Tuomi	Finland
5	Validation of the key enabling technologies	VTT, Ilkka Hiltunen	Finland
6	Bioenergy carriers	EIFER, Stephan Seidelt	Germany
7	Process design and techno-economics	WOOD, Luca Mancuso	Italy
8	Case studies, environmental analysis and business potential	CERTH, Konstantinos Atsonios	Greece
9	Dissemination, communication and exploitation	ETA, Stefano Capaccioli	Italy

3.4 Exploitation Committee

The Exploitation Committee (ExC) assists the Coordinator and the GA in innovation management, coordinates the exploitation and dissemination activities of the project and participates actively in the preparation of result exploitation plans. The ExC consists of one representative from each participant and is chaired by the Exploitation Manager (ExM) Juha Palonen from SFW. The members of the ExC that were nominated in the kick-off meeting are presented in Table 2.

The responsibilities of the ExC can be summarised as follows:

- Evaluation of the impact and defining the main project results;
- Leading and scheduling the exploitation and dissemination of the results during and after the project;
- Initiating the technology implementation activities as soon as exploitable results are obtained;
- Investigating all the measures to protect the results of the project considering the internal aspects of knowledge management within the Consortium

including IPR, technology transfer, patent opportunity analyses and innovation management.

Table 2. Exploitation Committee in the FlexSNG project.

Exploitation Committee	
VTT	Ilkka Hiltunen
CERTH	Konstantinos Atsonios
EIFER	Stephan Seidelt
DTU	Wolff-Ragnar Kiebach
SF	Maria Iwarsson Wide
CREAT	Mikael Frisk
UL	Mikael Rönnberg
PM	Paul Stuart
WOOD	Luca Mancuso
SFW	Juha Palonen (ExM)
JM	Andrew Steele
ETA	Stefano Capaccioli

The Exploitation Manager coordinates the project activities that aim for rapid market uptake: exploitation, market/industrial dissemination and IPR issues. The ExM is assisted by the Innovation Manager (IM) Esa Kurkela from VTT and the Dissemination Manager (DM) Stefano Capaccioli from ETA who were nominated already in the proposal phase. The main function of the IM is to assist the consortium in identifying new innovations seeds. The IM will participate in work package meetings wherever appropriate to nourish the creativity of the consortium and encourage active innovation. The DM will keep track of dissemination and communication activities throughout the project.

3.5 Industrial Advisory Board

An Industrial Advisory Board (IAB) is established to:

- Follow and assist the project in self-evaluation based on project reports and plans;
- Advise the project in exploitation of project results and bring the industrial point of view in all development phases;
- Provide recommendations in specific research topics based on their expertise.

The IAB is formed by external experts representing the industry and end-users in the value chain as well as other relevant experts in the R&D community. The IAB is foreseen to have an active role particularly in case studies and planning of follow-on industrial demonstration activities in both Europe and Canada (WP8-WP9). The IAB members are presented in Table 3.

Table 3. IAB members in the FlexSNG project.

Organisation	Name & country
Electricité de France (EDF)	Sebastien Gros (France)
Greenfield Global	Jean Roberge (Canada)
Helen	Jussi Uitto (Finland)

Canadian Hydrogen and Fuel Cell Association	Mark Kirby (Canada)
Praxair-Linde	NN - to be confirmed
Western University	Cedric Briens (Canada)
Bioenergy Europe	NN - to be confirmed

4 Communication methods

Efficient communication within the consortium (internal communication) is ensured by:

- Interactive and efficient meetings and teleconferences
- Frequent contact by e-mail, SMS and telephone
- Exchange of information and documents in project workspace

For engagement of also other relevant groups in the participating companies (marketing, business development, wider R&D), targeted communication outside the actively participating persons is made to assist in uptake and exploitation of the results. Active internal communication is used to demonstrate the great potential of the developed technologies also to the top management and business development managers of the participating companies.

4.1 Meetings

Consortium meetings play an important role in the project's communication strategy and facilitate knowledge transfer among the participants. They consist of WP, GA and ExC meetings and will be organised at approximately six-month intervals. The meeting schedule is presented in Table 4. The consortium meetings monitor the progress of the project. The following aspects are considered: 1) scientific progress including deliverables and milestones, 2) implementation risks and their mitigation actions, 4) dissemination, communication, and training activities, and 5) patent applications, exploitation aspects and detailed implementation plans. If deviations from the work plan become evident, contingency plans are proposed to the GA to overcome any difficulties or to modify the direction of research accordingly.

During the WP meetings, WP leaders summarise the progress of their respective WPs and plans for the subsequent period. Interactions among the WPs is encouraged. Minutes of the GA and WP meetings are compiled and uploaded onto the password-protected FlexSNG Teams site. Further *ad hoc* meetings are arranged and conducted in person, by telephone, Skype or video conference as appropriate.

Table 4. Meeting schedule.

Meeting	Date (month)	Participants
Kick-off meeting	1	All FlexSNG Participants
Consortium meetings • General Assembly meetings • Exploitation Committee meetings • Work Package meetings	Every 6 months (at the premises of partners)	All FlexSNG participants • GA members • ExC members • WP participants
Final meeting	By M36	FlexSNG participants

Half-day workshop in occasion of the European Biomass Conference and Exhibition (organised by ETA)	By M18	All FlexSNG participants, All stakeholders
Industrial Topical Workshops (ITWs) (organized by EIFER, PM and CANM with the support from ETA)	ITW#1 by M18, ITW#2 by M36	All FlexSNG participants, All stakeholders
Final conference (organised by ETA)	M36	All FlexSNG participants, All stakeholders

4.2 FlexSNG Teams workspace

FlexSNG Microsoft Teams site is used as a collaborative working space that allows coordinating the project activities internally, exchanging information and securely storing project data (e.g. deliverables, minutes of the meeting, draft publications). The aim is that all participants have the same knowledge level throughout the project, and all data and project documents are easily accessible on one platform.

4.3 Mailing lists

To facilitate effective communication within the consortium, mailing lists of specific project subgroups (WP/task level etc.) will be created and made accessible to partners at the outset of the project. Mailing lists will ensure that the correct persons will receive the information on time.

5 Project reporting

During the lifetime of the project, the consortium will provide regular updates on the progress of the project to the EC through continuous reporting. This includes periodic reports, deliverables and milestones that will allow the EC (CINEA) to review the project accomplishments against the Description of Action (DoA). Publications, on the other hand, are an essential part of project reporting that aim to disseminate the project results to the external audience.

5.1 Periodic reporting

Periodic reporting includes technical reports, financial reports, and the final report, as outlined in the reporting guidelines of H2020 Programme. The FlexSNG project is divided into two reporting periods as follows: RP1 (M1-18) and RP2 (M19-36).

- Periodic Report is produced at the end of each reporting period (M18, M36) containing a management-level overview of the activities carried out, a description of progress toward the technological objectives, a description of progress toward the milestones and deliverables foreseen, and identification of problems encountered during the project and the action taken to correct the problem.
- Summary Financial Report is produced after M18 and M36 containing the cost statements prepared by each participant, linking these costs to the resources deployed and activities carried out by the participant. When needed, the Certificate on Financial Statement of each corresponding party is sent at the end of the project. The Summary Financial Report brings together the incurred costs of the consortium and the requested Community contribution.

- Final Report comprising a publishable summary, a plan for the dissemination and exploitation of results and a report on societal implications is prepared at the end of the project (M39).

The Coordinator compiles periodic reports and financial statements based on input from project participants and submits them to the EC. Preparation of periodic reports will be initiated by the PC that provides a template and instructions to WPLs well before the reporting time. The scientific part of the report will be prepared by the WPLs on the basis of information provided by project partners. This work will be supervised by the PC. The PC will compile the report based on the material provided by WPLs and will include sections on management and financial issues. Periodic reports shall be delivered to the EC within 60 days after the end of the respective reporting period.

5.2 Interim progress reports

To better keep track of project activities over the tree-year project, the Coordinator collects interim progress reports from all participants every six months. Interim reports cover the following aspects: objectives, work progress during the reporting period, status of the deliverables and milestones for the reporting period, dissemination activities, exploitable results, problems or deviations from the Technical Annex, participation in other events related to the project, and co-operation activities during the period (between work packages and external). The report format will thus be congruent with the standard templates for EU reporting, facilitating the process of compiling and submitting the formal periodic reports to the Commission. As the individual participant reports will be the basis of the periodic reports, the Coordinator and WPLs will encourage the preparation of well-written reports from all participants on time.

5.3 Deliverables

Deliverables shall be submitted to the EC according to the timing and requirements set out in Annex 1 of the Grant Agreement. The partner responsible for the deliverable prepares the first draft and collects the required inputs from the other partners involved. All deliverables need to be finalized well before their official due date to allow time for quality and content review processes and thus maintain the highest level of quality. If a deliverable cannot be completed on time, the partner should inform the Coordinator immediately of the delay and provide a justification that will be shared with the PO. Deliverables will be uploaded on the FlexSNG Teams site where they are accessible to all partners. The official FlexSNG deliverable template (Appendix 2) will be used in all project deliverables that are submitted to the EC.

The deliverable submission and review process (Figure 3) applied in FlexSNG is briefly outlined below:

1. A reminder concerning the forthcoming deliverable
    - Coordinator sends a reminder concerning the upcoming deliverable to the responsible partner one month prior to the submission deadline.

- If deliverable is foreseen to be late, the coordinator should be informed immediately. Justification for the delay and an estimate of the new submission date should also be provided.

2. Preparation of the first draft and initial review
   - A draft version of the deliverable is prepared by the responsible partner and sent for initial review.
   - The deliverable is reviewed by one or two experts who will provide recommendations and comments. The reviewer may be the Work Package Leader (WPL) or the project coordinator (PC) depending on the nature of the deliverable.
3. Revised deliverable created
   - The deliverable is revised according to reviewers' comments.
4. Deliverable uploaded in Teams workspace
   - After reviewers' comments are implemented, the deliverable is uploaded to Teams site to make it accessible to other partners for comments. A fixed time limit will be imposed for comments.
5. Integration of comments (if any) and revision
6. Final quality check by the PC (VTT)
   - Final draft of the deliverable should be sent to the Coordinator 14 days prior to the submission date so that possible amendments can be implement on due time.
7. Final approval and submission
   - After approval, the Coordinator submits the deliverable to the EC Portal. At this stage, the status in the file name is changed to "Final".

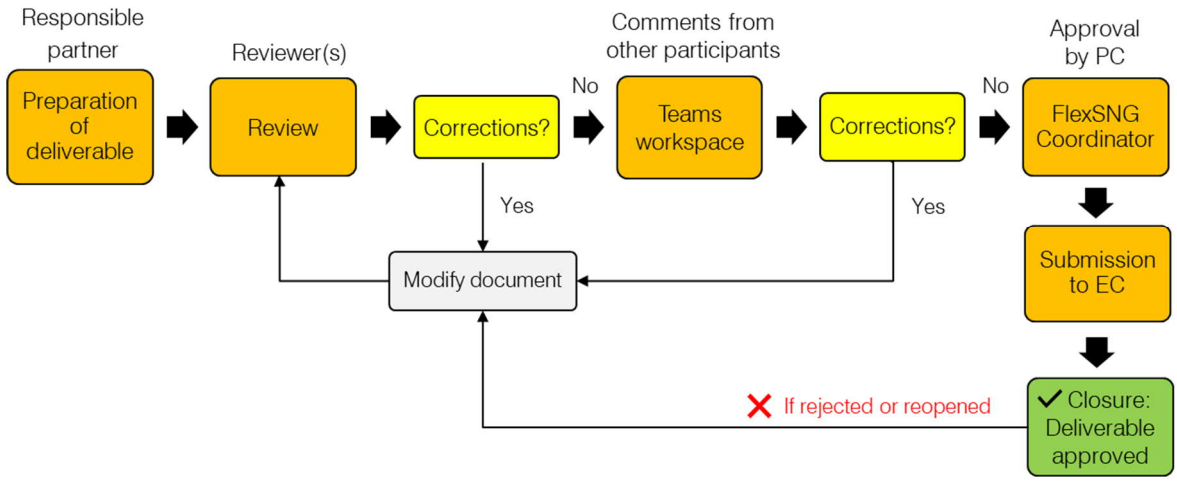

Figure 3. Procedure for internal peer-review of deliverables.

5.4 Publications

Publications include all articles and presentations generated for the external audience. Publications are an essential form of dissemination that allows to engage with different target groups: the scientific community, the industrial sphere and the public in general. Scientific publications will mainly target academia and other RTD entities, while more general overviews of the project/specific research topics will be published in magazines to reach a wider audience. The Dissemination Manager (ETA) will maintain a list of publications issued by the participants. All peer-reviewed scientific publications will be made available as open access and deposited in Open access repositories. A FlexSNG Community has already been created in Zenodo for this purpose.

As set out in the Consortium Agreement, prior notice of any planned publication shall be given to the other participants at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the Coordinator and to the participant(s) proposing the dissemination within 30 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

5.5 Document templates and acknowledgements

Document templates will be provided at the project outset to maintain a uniform format (consistently styled cover sheet and structure) in project reports, slides, meeting minutes etc. ETA is responsible for designing a set of templates for the FlexSNG project, including deliverable, poster, Power Point presentation and e-newsletter templates. Once finished, the templates will be made accessible to all partners via the FlexSNG Microsoft Teams site. By M3, the template for deliverables has been finished and accepted for use in the project (see Appendix 2).

All templates will include the project logo (Figure 4) and the official acknowledgement of EU funding along with the EU emblem (Error! Reference source not found.). EU funding must be acknowledged in all communication and dissemination activities of the project as well as in any infrastructure, equipment or major results funded by the grant.

Figure 4. Vertical logo of the FlexSNG project.

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 101022432 and the Government of Canada's New Frontiers in Research Fund (NFRF) and the Fonds de recherche du Québec (FRQ).

Figure 5. Acknowledgement of EU funding in the FlexSNG project.

6 Innovation Management

The main goal of innovation management within the FlexSNG project is to ensure that new innovations with commercialization potential are identified and developed further to meet the market needs. Innovation management allows the FlexSNG consortium to identify and respond to external or internal opportunities, and use its creativity to introduce new ideas, processes, products or services. In order to respond to external opportunities and challenges, the possible changes in the business environment and legislative issues in the business field (bioenergy, biofuels and bioenergy value chains) are followed actively by the partners. In case changes in the market trends or obstacles for commercialization are observed, the consequences will be considered and necessary actions for redirecting the project will be taken. Results obtained in FlexSNG are carefully evaluated for patentable inventions and patent applications are filed on inventions with sufficient novelty and business potential.

The innovation management in FlexSNG strives to:

- Assess the innovation potential of research results.
- Continuously monitor market, technology and policy trends.
- Outline the steps necessary to succeed in a new market or with a new customer (new technology/product, services), and to take corrective measures if needed to ensure that market needs are best met.
- Ensure favorable conditions for the effective exploitation of innovations during and after the end of the project.

The Exploitation Committee (ExC) is in charge of innovation management. The Innovation Manager (Esa Kurkela, VTT) provides guidance to the ExC and the consortium with regard to best practice in innovation management. The Innovation Manager coordinates and encourages innovation actions and co-operation with partners and also presents frequent innovation reviews to the Exploitation Committee. New innovation seeds will be evaluated in each WP and handled as a specific item in ExC and GA meetings.

7 Risk management

Project risk management aims to foresee and pre-empt critical risks for project implementation by preparing appropriate contingency activities. The WPLs follow the progress in their own work packages, deliverables and reports. Potential deviations from the Description of Action and their influence on the objectives and milestones will be communicated to the Coordinator and the GA. Deviations are evaluated constantly and corrective measures are discussed and implemented together with the Consortium and/or participant in question in the appropriate way during the project. Realised project risks will be handled by the GA and lessons learned from the risk assessment will be handled together by the GA and the Consortium. The aim is to make sure that the Consortium manages to fulfil the project objectives and goals on time and within the budget frame. The Description of Action, the Grant Agreement and the Consortium Agreement are updated accordingly. Unforeseen delays and other deviations that have

a prominent effect on project execution shall be immediately communicated to the CINEA office.

Critical risks for project implementation and proposed mitigation actions that were identified in the proposal phase are summarised in Table 5. These identified risks will be reviewed in GA meetings and updated accordingly.

Table 5. Critical risks for implementation.

Description of risk and indicative level of likelihood	WPs involved	Proposed risk-mitigation measures
Administrative risks		
Changes in the consortium - *Medium*	All	Tasks assigned to the leaving participant will be reallocated among the consortium or new participant will be invited and integrated to the consortium
Unclear roles and responsibilities between participants - *Low*	All	Defined in CA and Grant Agreements; effective communication (regular face-to-face meetings, active role of coordinator)
Risks related to participants' operational environment (force majeure) - *Low*	All	Effective communication; participants obligation to inform coordinator and consortium; amendments to the Description of Action
Risks related to key persons - *Low*	All	Communication, follow-up and regular monitoring of the work progress; participants take responsibility for their resources
Risks related to delays, poor execution, contract breach or conflict of interests including third parties - *Low*	All	Proper procurement procedures and selection criteria; clearly defined decision-making mechanisms, agreements and conditions
Financial risks		
Insufficient financial reporting - *Low*	1	Ensuring compliance with accounting rules, keeping records and timesheets; timely submission of financial statements
Unexpected changes in resource allocation - *Medium*	1	Possible needs for reallocation of budget between different WPs and/or participants may be considered
Technical and operational risks		
Insufficient or uncertain data available for the drying forecast tools and feedstock supply chain models – *Low to medium*	2	Uncertainty of data is considered in the model and method development. A mix of advanced data analytics will be used to identify the most important data sources and their impact, and analytics model will be used to counteract any negative impact of low data quality.
OTM module not completed and commissioned on time or fails during testing campaign - *Low to medium*	3, 5	In case the OTM module is not available in time or fails to deliver oxygen in the required amounts or purity, oxygen will be simply supplied from bottles available as back-up on-site. This will allow running all experiments as planned, and will allow time to fix the OTM module. DTU personnel will be present during operation to ensure that the potential downtime is minimal.
Gasification pilot plant modifications not completed and commissioned on time - *Low*	4, 5	Planned modifications are not very challenging, considering VTT's extensive experience and support from SFW. Preliminary pilot test and CFD modelling activities will create a strong basis for realizing plant modifications smoothly and within the planned budget and time.

Challenges in operating the gasifier and the hot gas filter unit under low-temperature "co-production" mode - *Low to medium*	4, 5	The challenges are expected to be mainly related to feedstock flexibility and high concentration of tars and hydrocarbon gases at gasifier outlet. VTT has extensive scientific background that allows overcoming ash-related issues in the gasifier and soot blinding of filter elements. The high partial pressure of steam in raw gas helps to avoid soot formation.
Tar conversion degree in the catalytic reformer does not meet the targets - *Medium*	4, 5	VTT has patented and demonstrated a staged reforming concept, which has shown effective tar removal without soot formation issues in fluidised-bed gasification conditions. New developments related to improved reformer design and operation conditions resulting in high-tar conversion but minimal methane conversion have been developed and tested in laboratory and will be utilised in FlexSNG. Alternative reformer catalysts can be supplied by JM.
Syngas quality does not meet the required specifications of the VESTA methanation unit - *Medium*	4, 5, 7	Various final gas cleaning alternatives are available and are evaluated (WP7) to ensure compatibility (composition, sulphur level) for end use. VESTA process is also less sensitive to fluctuations in syngas composition than competing solutions.
Inadequate biochar quality for high-value applications – *Medium*	6	If the quality of biochars from various main sources are very low, combustion of biochar remains as only possible valorization route.
Insufficient number of input data available from the pilot tests for scale-up modelling activities - *Low*	7	In case that part of the required process specifications cannot be retrieved from the experimental campaign, CERTH has the experience from previous relevant projects to make the necessary assumptions for the missing parameters.
Dissemination, communication and exploitation risks		
Communication regarding the project and its results is not properly targeted (message is not clear) - *Low*	9	Communication to be modified according to the audience.
Target audience not reached - *Low*	9	Updates to dissemination plans; use of adequate tools and channels; relevant materials (content selected based on the audience/target group, visual aspects and interactive means)
Social acceptance and permitting for FlexSNG plants turn out to be challenging - *Medium*	9	Dissemination activities include active communication with stakeholders of bioenergy/biofuel value chain. Public outreach initiatives and business-related risks are evaluated in WP9.
Risks related to ownership and user rights - *Low*	All	Defined in the CA; transparent and efficient Exploitation Plan. Joint review of ideas in the beginning of the project.

8 Conflict resolution procedures

In all management and research actions in the project, the Consortium aims at working unanimously. As a general rule, the approach to project management in FlexSNG aims at a consensus building and promoting in order to ensure the maximum cooperation within the consortium. Responsibility of each participant is to take part in the efficient implementation of the project, and to cooperate, perform and fulfil, promptly and on time, all of its obligations under the Grant Agreement and the Consortium Agreement.

However, if the unlike events arise, the issue should be resolved as quickly as possible through a fair and transparent decision-making process. Where possible, issues will be resolved at WP level. Each Work Package Leader shall identify problems or conflicts within their respective WPs. If possible, the WP Leader shall try to find a solution. In case the issue cannot be resolved at WP level, the matter will be reported to the Project Coordinator (VTT), who will also keep the GA informed about the issues to be solved. GA acts as the ultimate decision-making body in the project and will review the issue. Where appropriate, the Coordinator may also inform the Project Officer about the issue at hand.

9 Measures to promote gender equality

Gender issues are considered across all the FlexSNG project stages to ensure both the excellence and the social relevance of the results. The participants take all measures to promote equal opportunities between men and women in the implementation of the action in the FlexSNG project.

The research institutes and partners involved in the project have enrolled scientists of both genders for the project work and there are also female WP and task leaders within the project. Many national governments have developed measures to increase the participation of women in science and technology, and the European Commission has developed its own actions towards gender neutrality. The FlexSNG consortium will by its own effort take part in the three overall strategies described in Guidelines for Gender Equality Programmes in Science 14:

- Making science and technology an enabling environment for women's progression and working life
- Include the gender dimension in the process of research and innovation designing
- Promoting women in scientific leadership positions

Gender bias will be avoided in all FlexSNG project communication and dissemination.

Appendix 1

Consortium contact information

Appendix 2

Deliverable Template

Deliverable Dx.x

Title

Dissemination level: xxx

Due date: xx/xx/2021

Grant Agreement (GA) No. 101022432

Research and Innovation Actions (RIA) project

Granted by: Climate, Infrastructure and Environment Executive Agency (CINEA)

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 101022432 and the Government of Canada's New Frontiers in Research Fund (NFRF) and the Fonds de recherche du Québec (FRQ).

Appendix 2

Document Control Sheet

Project	FlexSNG - Flexible Production of Synthetic Natural Gas and Biochar via Gasification of Biomass and Waste Feedstocks		
Call/Topic	International cooperation with Canada on advanced biofuels and bioenergy		
Type of action	Research and Innovation Action (RIA)		
Grant Agreement No	101022432		
Start date	01/06/2021	Duration	36 Months
Project Coordinator	VTT Technical Research Centre of Finland Ltd		

Work Package No	WPx	Task No	Task x.x
Due date (in months)			
Actual submission date	xx/xx/xxxx		

Lead Beneficiary		
Contributor(s)		
Dissemination level	Public	
	Confidential, only for members of the consortium (including the Commission services)	

Revision history

Version	Date	Modification	Author

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Table of Content

Abbreviations and acronyms