H2IF – Bridging Horizon 2020 to Innovation Fund

D4.1 – Guidance for supporting the community of applicants to the Innovation Fund instrument

Work package 4 – IF Proposals preparation strategy and first iteration

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Information

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NB: it should be noted that the title of the deliverable D4.1 (and its public nature) have been modified for the benefits of the community of IF applicants. Initial title of the deliverable was 'Action plan for proposals presentation' with a dissemination limited to the consortium H2IF and the services of the Commission. The modified deliverable is public with a new title: 'Guidance for supporting the community of applicants to the Innovation Fund instrument'.

Dissemination Level

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Abbreviations and acronyms

CORDIS	EC's Community Research and Development Information Service
CSA	Coordination and Support Action
DMP	Data Management Plan
EASE	European Association for Storage of Energy
EC	European Commission
ES	Energy Storage
FAIR	Findable, Accessible, Interoperable, Reusable
GA	Grant Agreement
GB	Gigabyte
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
H2	Hydrogen
H2020	Horizon 2020
HE	Horizon Europe
IF	Innovation Fund
MB	Megabyte
MS	Microsoft
PSI	Public Sector Information Directive
R&I	Research and Innovation
R&D	Research and Development
WP	Work Package

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Executive Summary

This document represents D4.1 “Guidance for supporting the community of applicants to the Innovation Fund instrument” developed under Task 4.1 “Definition of checklist and action plans for proposals preparation” of WP4 “IF Proposals preparation strategy and first iteration”, of the H2IF project, funded under Horizon Europe’s Call HORIZON-CL5-2023-D2-01 (Grant Agreement n.: 101137734). This public document aims at supporting future applicants targeting the preparation of a project to be submitted to the Innovation Fund instrument.

The deliverable is organised in 7 main sections and annexes. After a general introduction of the document (Section 1), it describes an overview of the documents requested by the instrument (Section 2). Section 3 provides experience-based hints, Section 4 focuses on the first strategic decisions to be taken by applicants (topic, sector, product). Enabling templates for the applicants are detailed in section 5 (macro planning, annotated templates for the Business Plan and Feasibility Study). Section 6 to Section 8 conclude respectively with hints inspired by more mature IF awarded projects, the modalities of update and capitalisation process to be organised during the next stage of H2IF project.

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1. Introduction

Work package 4 is dedicated to the first iteration of proposals preparation. The very first task 'T4.1 Definition of checklist and action plans for proposals preparation' is devoted to the definition of a standardised checklist of documents to be prepared and information to be gathered for the IF applications.

The current deliverable 'D4.1 – Guidance for supporting the community of applicants to the Innovation Fund instrument" intends to be of public nature for supporting future applicants targeting the preparation of a project to be submitted to the Innovation Fund instrument. It capitalises previous activities of H2IF[1] to go further in providing more operative plans for future applicants.

This deliverable includes:

- the **standardised checklist of documents** required by the IF call (and based on the 2023 call), it takes the form of a toolbox supporting preparation;
- **annotated templates for two key documents of the application**: the Feasibility Study and the Business Plan. Both templates have been co-built based on the consultant track records. They will include guidance to support its preparation;
- **the organisation of the IF submission**, time wise, in the form of a macro-planning to be adapted and used by the applicants to match to the particular IF call they target.

A founding assumption retained to elaborate the current document is to consider a typical IF call based on the last available package of information, either formal prescription or guidance material (video recording of info days, tutorials, FAQ, etc.).

[1] in WP3 and deliverable D3.1 of H2IF project.

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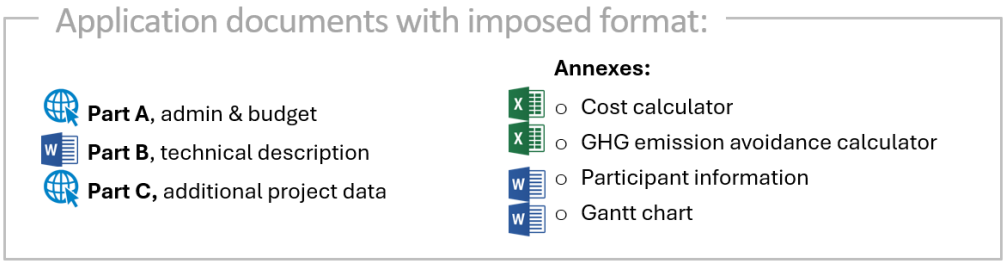
2. The standardised checklist of documents

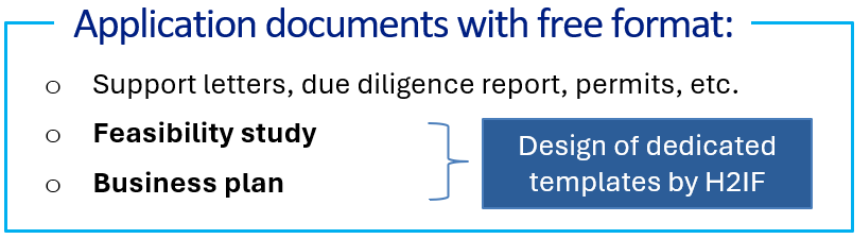
2.1. Observations on the types of documents requested by a typical IF call

Based on the 2022/2023 call, the pieces required for the submission include (i) online forms, and (ii) documents to be uploaded to the submission portal.

The degree of prescription imposed by the IF call also matters. Some application documents must comply with a given format, as illustrated in the diagram below.



Other compulsory components can be provided under a free format. The H2IF consultants propose annotated templates for the Feasibility study and Business Plan, which are too critical documents in the application: those annotated templates are included in Annex of the present report.



The request of a Knowledge Sharing Plan remains to be clarified according to the instructions of next IF call: guidance will then be updated accordingly.

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2.2. The five evaluation criteria and the cascade mode of evaluation

The five evaluation criteria of an application are: the Degree of innovation, the GHG emission avoidance potential, the project maturity (Technical, Financial, Operational), the Replicability, and the Cost efficiency[2].

They follow a verification of eligibility and admissibility criteria in a cascade mode, including the four stages indicated in the figure below.

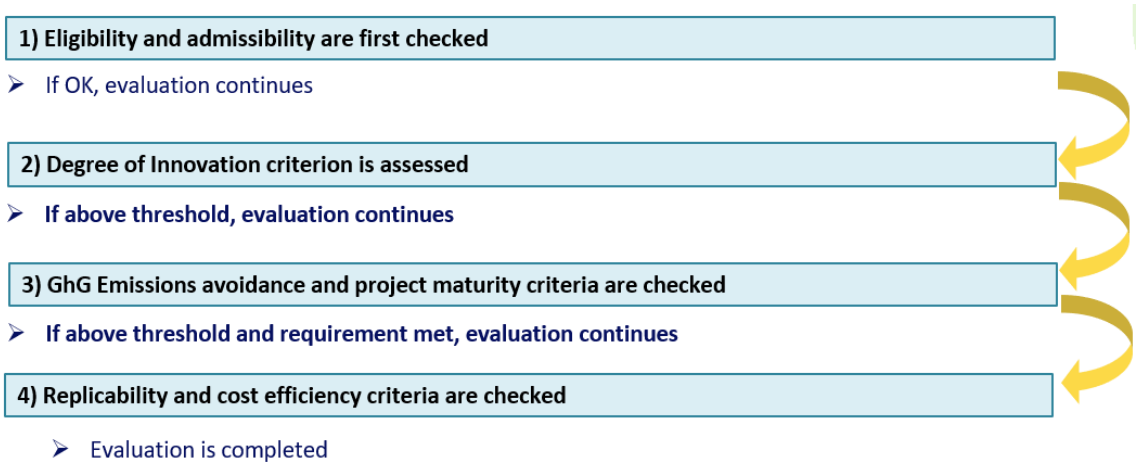

Figure 1: The cascade evaluation of an IF application

As a result, a list of pre-selected projects is established to be consulted with Member-States. Last, the selection procedure leads to the following outcomes: a project is either awarded grant, awarded seal of sovereignty if reaches all thresholds but does not win grant. Should a project not reach the threshold, the project will be invited to reapply next year.

2.3. Overview of IF components with regards to the evaluation criteria

Based on the track record of consultants on IF preparation, the standard list of documents publicly available (Part A, Part B, Part C, and annexes) was analysed according to their respective contribution to the five evaluation criteria (Degree of innovation, GHG emission avoidance potential, Technical maturity, Financial maturity, Operational maturity,

[2] Bonus points may also be given for specific cases.

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Replicability, and Cost efficiency). Indeed, it appears that the overall matrix resulting from this cross analysis is far from being diagonal.

Next figures detail this analysis in two steps, first for Part A, B and C, then for the Annexes.

		Mandatory?	Degree of innovation	GHG emission avoidance potential	Technical maturity	Financial maturity	Operational maturity	Replicability	Cost efficiency
Part A	Budget and administration	Y				x			x
Part B		Y							
	Section 0: Technical characteristics & scope				x				
	Section 1: Degree of innovation		x						
	Section 2: GHG emission avoidance			x					
	Section 3.1 Technical maturity				x				
	Section 3.2								
	Section 3.3 Operation maturity						x		
	Section 3.4 Risk management				x	x	x		
	Section 4: Replicability							x	
	Section 4: Cost efficiency								x
	Section 7.1 Work plan						x		
	Section 7.2 work packages & resources						x		
Part C		Y		x		x		x	x

Figure 2: cross analysis of Part A, B and C with regards to the evaluation criteria

		Mandatory?	Degree of innovation	GHG emission avoidance potential	Technical maturity	Financial maturity	Operational maturity	Replicability	Cost efficiency
Annexes									
	Feasibility study	Y	x	x	x				
	Any existing technical due diligence report	N	x	x	x		x		
	GHG emission avoidance calculator	Y		x					
	Business plan	Y				x			
	Letters of intent	N			x	x			
	Detailed calculation of relevant costs	Y				x			
	Financial Model Summary Sheet	Y				x			
	Applicant's detailed financial mode	Y				x			
	Gantt	Y					x		
	Participant information	Y					x		
	Knowledge Sharing Plan	check call						x	
	Audit statement on Relevant Cost	Y				x			

Figure 3: cross analysis of Annexes with regards to the evaluation criteria

Both figures can be used for pedagogical purposes to help applicants to be acquainted and for a self-assessment of the work carried out at any time of the preparation of the IF application:

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- *Ex ante*, to guide the applicant in the complexity of various requests.
- *Ex post*, as a sanity check of completion of the arguments collected and built in each piece to support the respective requirements per criterion.

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3. Hints and tips based on track record of previous submissions

A review of the five evaluation criteria is proposed with a selection of recommendations identified by the Innovation Fund programme for future applications. For more details one could refer to the source Info Day Innovation Fund 2023 Call, December 2023, for pedagogical purposes a concise version is proposed below by the H2IF consultants.

The five tables below have been enriched with specific features related to the H2IF domains (energy storage and Hydrogen).

Criterion Degree of Innovation

Criterion

Degree of Innovation

Components (if any): N/A

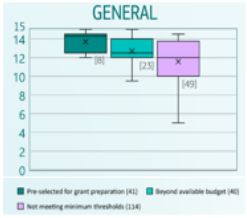
Recommendations in brief

- Build a clear narrative,
- Gather evidence,
- Refer to the 'Feasibility study
- Consider the ongoing 'IF projects'

Score*

- **Score 'degree of innovation'** of preselected applications for grant preparation ranging from 8-12 with an average ~14 (out of 15)

*statistics are based on LSC 2022 evaluation



Specific hints for this criterion

- **Build a solid state-of-the-art (SoA)** on technological and commercial aspects .
- **Include quantitative data:** costs, performances and technical characteristics, maturity levels (TRL, MRL). The KPI shall be compared to the SoA data, which implies a careful selection of comparison parameters. Energy efficiency and circularity could be considered to support the comparison
- **Identify the step forward in comparison to the SoA.** Elements of comparison shall be based on comparison with previous and ongoing EU and IF projects, considering the geographical reference point of the projects.
- **Identify barriers** both for technology integration and scaling up
- **Gather evidence in the various pieces:** Feasibility Study, GHG calculation, etc.
- **Implementation of innovation matters:** This include integration features or protection of innovation (e.g. data on patenting if relevant)

Other considerations specific to the H2IF domains

- Applications in energy storage shall present the added value with regards to other technologies including the techno-economic and environmental characteristics: e.g., time of charge, discharge, efficiency, cycling and ageing, energy density, electro-chemicals risks, capex and opex, considering mature or technologies in development
- Applications in Hydrogen shall consider the KPI included in the Multi annual roadmap

Criterion GhG emission avoidance

Criterion

GHG emission avoidance

Components (if any): Absolute, relative, quality of the calculation and minimum requirements

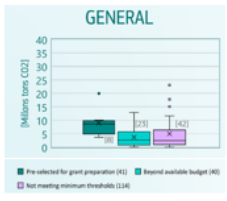
Recommendations in brief

- The clarity of the calculations and the careful selection of the domain, sector

Score*

- **Score 'eq avoidance'** of preselected applications for grant preparation ranging from 4-10 Mt eq CO2 with an average ~9 Mt eq CO2

*statistics are based on LSC 2022 evaluation



Specific hints for this criterion

- **Avoid the most recurrent mistakes identified from previous calls:**

Inadequate reference scenario and emissions factor,
Difference in scope of reference and project scenarios,
Project boundaries differed from the methodology ones,
Additional GHG savings claimed under absolute GHG emissions avoidance

- **Justify the calculations:** ensure that assumptions and data are supported with evidence

Other considerations specific to the H2IF domains

- The selection of the reference scenario might be tricky in some configurations that are not sufficiently covered by the methodology description. In such situations further justifications need to be brought (e.g. case of storage of hydrogen)
- The projection of the business plan includes uncertainty in the physical flows, thus in the GHG values. Management of such uncertainty shall be carefully addressed

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Criterion Project maturity

Criterion

Project technical, financial and operational maturity

Components (if any): Technical, Financial, Operational

Score*

Score of preselected applications for technical and operational maturity ranges from 4 to 5, for the financial maturity from 3 to 5 (statistics are based on LSC 2022 evaluation)

Recommendations in brief

- **Technical**: Explain the degree of technology readiness of the proposed solution and the technical feasibility of delivering the expected output
- **Financial**: Assess the project capacity to reach Financial Close within 4 years or faster through a credible and sound business model and business plan
- **Operational:** Credibility and level of detail of project implementation plan covering all project milestones & related deliverables

Specific hints for this criterion

- **Technical maturity**: document the actual readiness level of your technology in a factual (if possible quantified) and concise manner. The description of risk and mitigation strategies need to be presented. Evidence shall come from due diligence report, procurement quotes, MoU, LoI, LoS
- **Financial maturity** often lacks credibility or of inconsistencies or evidence might be missing. The assumptions of the BP shall be credible. Another weakness observed by almost half of the projects are the fact that the financing plan is not credible (either with no evidence of commitment or debt without repayment capacity) or the project or leads to unprofitability. It is highly recommended to follow the instructions on WACC calculations. The consistency between all documents shall be verified.
- **Operational maturity**, the first step consists in building a realistic project timeline which is consistent with technical and financial features of the application. Then risks and mitigations strategy shall be carefully addressed and supported by a set of contractual evidence.

Other considerations specific to the H2IF domains

- The WACC of big companies of energy might be different from the WACC recommended by the IF application.

Criterion Replicability

Criterion

Replicability

Components (if any): 5 components mentioned in the box 'recommendations in brief'

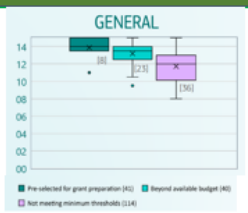
Recommendations in brief

- Address replicability in terms of efficiency gains, further deployment, resilience of EU industrial system, potential in terms of multiple environmental impacts, quality and extent of the knowledge sharing

Score*

- **Score** of replicability of preselected applications for grant preparation ranging from 13.5 to 15 with an average ~14

*statistics are based on LSC 2022 evaluation



Specific hints for this criterion

- **Address all aspects covering the replicability** (mentioned in the box in the left)
- **he plan for technology uptake in other sites:** credibility and evidences shall be brought
- **Credible assumptions on cost reductions:** to be supported with evidence
- **Exploitation:** Elaborate ad hoc IPR and licensing strategies
- **Communication and Dissemination** strategies
- **Refer to the policy framework** (EU policy objectives and initiatives)

Other considerations specific to the H2IF domains

- The regulatory context of energy storage or hydrogen and the consideration of possible evolutions
- The consideration of existing roadmaps on Hydrogen or energy storage providing order of magnitude of industrial deployments

Criterion Cost efficiency

Criterion

Cost efficiency

Components (if any): direct calculation from requested IF grant (and other public support/ abs. GHG emission avoidance)

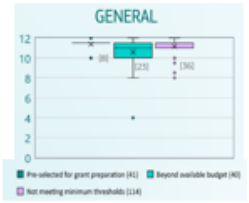
Recommendations in brief

- We could decrease the IF grant requested (below the 60%) to be more competitive
- The score is known at the stage of the application

Score*

- **Score** of cost efficiency directly results from a calculation
- For applications preselected for grant preparation ranging from 10 to 12, with an average ~11.5

*statistics are based on LSC 2022 evaluation



Specific hints for this criterion

- **Avoid the identified weaknesses for the criterion:**
  - WACC not aligned with methodology, ineligible cost included, change in the model start date (each for about 1/4 of situations).
  - Other weakness consist in adopting a wrong choice of RC methodology or including inconsistencies

Other considerations specific to the H2IF domains

- The search of complementary public fundings might impact the numerator of the calculation
- Elaborate and test scenarios of reduction of the IF grant request to comply with a target score

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4. How to select the relevant Innovation Fund SECTOR and PRODUCTS for H2 and energy storage projects?

Last IF call was launched in November 2023 with a deadline in April 2024. It covered five topics with a budget of €4 billion raised from the auctioning of EU Emissions Trading System (ETS) allowances

Thus, based on last call, multiple options are open for the Innovation Fund instrument.

Table 1: Overview of options for the IF instrument

Topics	Description
General decarbonisation (large-scale)	€1.7 billion available for projects with CAPEX (capital expenditure) above €100 million
General decarbonisation (medium-scale)	€500 million available for projects with CAPEX between €20 million and €100 million
General decarbonisation (small-scale)	€200 million available for projects with CAPEX between €2.5 million and €20 million
Cleantech manufacturing	€1.4 billion available for projects with CAPEX above €2.5 million focusing on component manufacturing for renewable energy, energy storage, heat pumps and hydrogen production
Pilot	€200 million available for projects with CAPEX above €2.5 million focusing on deep decarbonisation[3]

❶ The very first decision relates to the selection of a topic that will determine the design of the application. The estimated CAPEX of the project is the criterion that will orient to a large-scale (above EUR 100 million), medium-scale (between EUR 20 and 100 million), or small-scale project (2.5-20 EUR million).

[3] i.e., technologies that can reduce relative GHG emissions by at least 75% compared to the reference scenario.

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Two other topics can be targeted for the preparation of an IF application: the clean-tech manufacturing and pilot projects (for both categories, CAPEX shall be above EUR 2.5 million)

To finalise the decision, the size criterion shall be cross-analysed with the sector(s) covered by the application:

- The **'pilot projects'** shall include highly innovative, deep decarbonisation solutions in a sector eligible for IF support
- The **'cleantech manufacturing for components'** topic refers to renewable energy installations, electrolysers and fuel cells, energy storage solutions, and heat pumps. It promotes innovation either in cleantech manufacturing process or in improvements of the final product.
- Last for the other topics **(large-, medium-, small-)** the sectors covered are mentioned in Annex I and Annex III to the EU ETS Directive2003/87, including CCU, CCS, renewable energy and energy storage technologies, maritime and aviation.

❷ The second classification to be clarified very early in the project is the classification of projects into SECTORS and PRODUCTS:

- SECTOR is defined by grouping EU ETS activities, while
- PRODUCTS refer to products of sector, derived from EU ETS activities and PRODCOM.

The table below filters out the table of section A1.4 of the document named 'Annex A: Methodology for calculation of GHG emission avoidance' for future applications in H2IF related domains.

Table 2: classification of projects into sectors for H2IF-related applications (energy storage, hydrogen, energy intensive industries) based on the Annex A methodology.

SECTOR		**PRODUCTS**
Energy storage	ID electricity storage	electricity
Production facilities for components	Other energy storage	electricity heating/cooling e-fuels hydrogen
Energy-intensive industries CCU Substitute products	Refineries	fuels (incl. e-fuels)

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	Biofuels and bio-refineries	biofuel, bio-based products
	Hydrogen	hydrogen
	Other	electricity heat other
CCS	CO2 Transport and Storage	CO2 Transport and Storage

When considering the above table, one key point emerges for projects dealing with Hydrogen: shall the Hydrogen project consider the "energy intensive industries", if the choice is made to sell an industrial product, rather than an energy carrier?

The answer to this question will depend on the applicant choice concerning the Business Model?

❸ The following recommendations are formulated to future applicants.

- **Hint 1:** each applicant shall proceed to the above decision and select the appropriate lines[4] **based on business intentions**.
- **Hint 2:** each applicant shall determine the 'topic' based on the CAPEX criterion and the opportunity to apply to one specific call (pilots or components). To that purpose, the business intentions drive again to decide whether the application shall focus on the manufacturing of batteries (massive production) or on the production plant itself by selecting one line in Table 2.
- **Hint 3:** once the combination SECTOR X PRODUCTS have been defined, it is recommended to elaborate a model of the physical flows, again starting from the business intentions. It is recommended to describe the sequence: **physical flows → economic flows → financial flows** for a given system with boundary conditions.

[4] Here 'lines' refer to the 'topic' introduced in Alinea ❶and to the combination 'SECTOR' X 'PRODUCT' discussed in Alinea ❷

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5. The developed templates

The H2IF consultants propose a generic planning to support the main steps of the application preparation, together with two templates for two strategical documents: the Feasibility Study and the Business Plan.

5.1. Process wise, a generic planning towards IF submission

In order to support the preparation of an application it is highly recommended to anticipate the preparatory steps far ahead of the publication of the call. This work has to be guided by the previous calls' instructions and guidance and will be adjusted once the call is published and according to new FAQ based exchanges with the IF services.

In addition, it should make clear that applicants have to allocate sufficient resources for the setting-up of the projects to reach the desired quality standards. Staffing of the team members must be foreseen by the applicant and at a sufficient level: an estimation of 3-5 person*months of internal resources, plus the support of an external specialised consultant.

The proposed macro planning has been built on five main stages and start about 9 months ahead of submission. The five stages are:

I) GAP ANALYSIS

Assuming that the starting point is the outcome of a Horizon project taking the form of a Key Exploitable Result, described in terms of maturity, technical characteristics and performance, ownership and intentions of exploitation, this first stage consists of the preliminary verification of the suitability of such outcome for an application to the Innovation Fund instrument. The eligibility criteria are thus examined and to understand the general consistency of the project with the decarbonation intentions. These criteria include:

- The verification that participant(s) are legal entities, and that projects are located in the EEA (EU MS and Iceland, Liechtenstein, Norway)
- The verification of estimated timelines: the ability to reach the financial close within 4 years after grant signature and the ability to operate more than 5 years after entry of operation[5], this constitutes the minimum monitoring period of GHG emission avoidance)

[5] Excepting SSP and Pilots (3 years instead of 5)

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- The verification of eligibility of activities.

The constraint in terms of maximum amount for grant (less than 60% of the relevant costs) can be interpreted as a design constraint for the preparation of the application.

In addition, one shall mention that the admissibility criteria include the completeness of the application file as well as a submission according to the call and Submission System requirements (deadline, forms).

For the general call (Large, medium- and small-scale projects):

- Supporting innovation in low-carbon technologies and processes in sectors listed in Annex I and Annex III to the EU ETS Directive 2003/87, including environmentally safe carbon capture and utilisation (CCU), as well as products substituting carbon-intensive ones produced in sectors listed in Annex I.
- Construction and operation of projects that aim at the environmentally safe capture and geological storage of CO2 (CCS).
- Support the construction and operation of innovative renewable energy and energy storage technologies.
- A spectrum of activities in the maritime and aviation sector is also eligible when dealing with energy efficiency or low carbon technologies.

This category might be of interest for projects in H2IF domain provided that the project size (by CAPEX) is respected:

- Small scale projects: up to €20 million
- Medium scale projects: from €20-100 million
- Large scale projects: above €100 million.

Cleantech components manufacturing:

In its definition, the term 'components' includes the final equipment. Its rationale is to target the components and materials that have a significant impact in the cost and / or performance of the final equipment. This category aims at (i) fostering innovative manufacturing in cleantech for hydrogen production/consumption, renewable energy, and

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energy storage; as well as (ii) building industrial capacity, technology leadership, and supply chain resilience within the EU[6].

This scope might be of interest for projects in H2IF domain: the focus shall be either on the final equipment or to components and materials having a significant factor in the final equipment (either in terms of performance or cost). Recycling or reuse can be an option for this category. Last, applicants shall give importance to factors such as cost reduction, performance improvement, efficiency, or sustainability.

Pilot projects:

This category aims at supporting more innovative or disruptive technologies in deep decarbonisation. One shall refer to the Annex I and III of the EU ETS Directive 2003/87 for the CCU or the products substituting carbon-intensive ones. The construction and operation of innovative energy storage, CO2 storage and renewable energy installations, including electricity / heat grid connections is also included. Emphasis for these projects will be given to:

- the degree of innovation criterion is doubly weighted: projects will have to prove an innovative technology in an operational environment (no expectation to reach large scale demonstration or commercial production)
- the proof of project viability rather than project profitability
- the fact that the relative emission avoidance for these projects should be above 75%
- last, the contribution to EU industrial capacity, technology leadership, supply chain resilience and strategy autonomy.

II) GOVERNANCE

At the launch of the application, governance prescriptions have to be agreed between all parties involved in the preparation of the IF application: they are of prime importance to build a quality proposal. This includes the processes and the definition of the teams and their particular roles.

[6] As mentioned above typical solutions are renewable energy installations, electrolysers and fuel cells, energy storage solutions (stationary or mobile for intra-day and long duration storage) and heat pumps.

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Staffing and roles:

On this specific dimension, it is critical to appoint a team of complementary competences, with budgeted time to prepare the proposal:

- A project manager, who will liaise between the different expertise listed below (and how can cover one of them)
- A contact point at top management level, to ensure the full alignment and integration of the IF application with the corporate strategy
- A contact point in the financial department, to elaborate all financial models and plans requested
- A contact point in the technical department, to formalise the elements related to the technical feasibility and project implementation plan
- A contact point in the commercial department, to formalise all items related to the market strategy.

Follow up procedures:

- The progress on the various work streams needs to be carefully monitored due to the complexity and high number of tasks. It is recommended that a regular conference call is held by the project manager in a predefined pace (usually bi-monthly or weekly).
- The rules for the involvement of the team members to each of the call have to be defined and agreed.

Validation procedures:

- Decision making on critical points as well as on the validation of the components of application has also to be fixed ex ante: how and by whom will be made the review and the quality validation? How long will last the review stage?

III) BUILDING THE COMPONENTS

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Components here refer to the collection of all data, proof of evidence, and arguments to sustain the evaluation criteria, the three types of maturity (Financial maturity, Technical maturity, Operational Maturity), the CO2 emission calculations, the degree of innovation.

The timeline foresees several iterations for a progressive setting-up during about three quarters (nine months). This means that the preparation of an application starts well ahead of the publication of the call, assuming that these components might be adjusted with the call requirements.

IV) FORMALISATION, REVIEW AND VALIDATION

This fourth section consists in the transcription of the components into the form of the mandatory documents and annexes in their expected form. In particular: Part A online, Part B, in the limit of a 80 pages document, Part C on line and a series of Mandatory annexes. These annexes include:

- Detailed budget table/relevant cost calculator ('financial information file')
- Participant information (including CVs and previous projects, if any) timetable/Gantt chart
- GHG emission avoidance calculator
- Feasibility study, 60 pages max. See our annotated template.
- Business plan, 60 pages max. See our annotated template.
- Detailed financial model
- Knowledge Sharing Plan
- Any letter supporting the project, either in terms of supply, due diligence report, permits licenses, authorisations.

V) CAPITALISATION

A return on experience is foreseen for multiple purposes: for the applicant for possible future applications (resubmission or not), for the consultants or other intermediates to generate experience-based hints and recommendations, for the H2IF project as reporting, for the IF instruction teams for providing recommendations in the call process.

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TIMELINE

As mentioned above, we strongly recommend to applicants to anticipate the launch of a project application ahead of the call publication. We recommend a period of 9 months for the preparation from the launch to the submission as depicted in Figure 9 which illustrates the successive iterations. An intensification of the setting-up takes about 6 months ahead of the estimated submission deadline.

For readability purposes we split the macro planning into five blocks, the overview being displayed in Figure 9.

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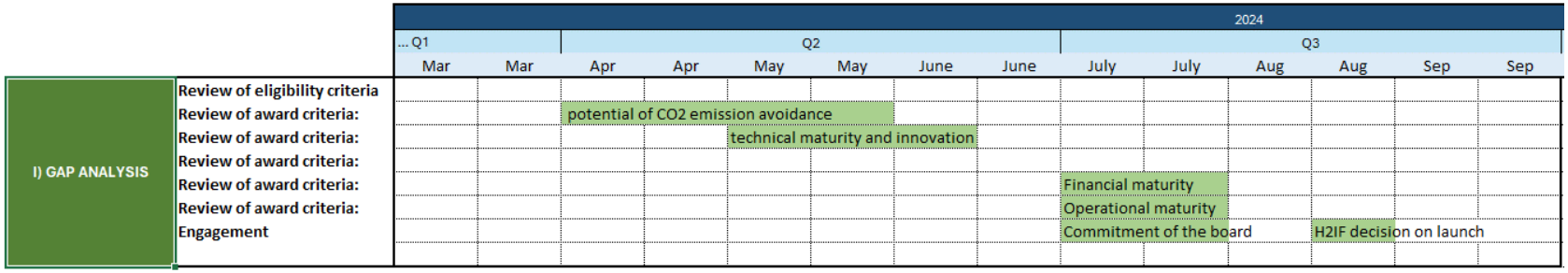

Figure 4: Planning 'Gap analysis'

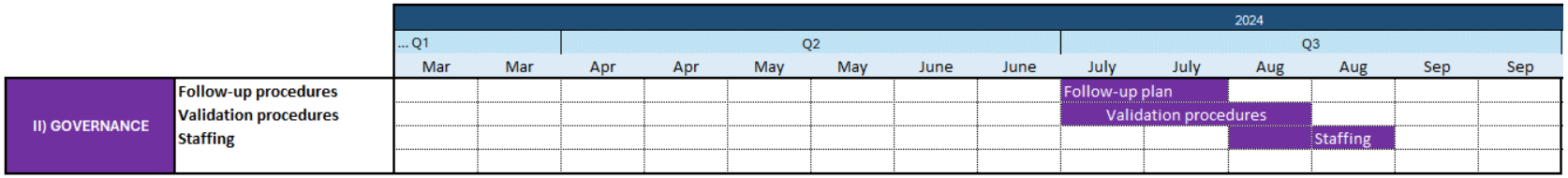

Figure 5: Planning 'Governance'

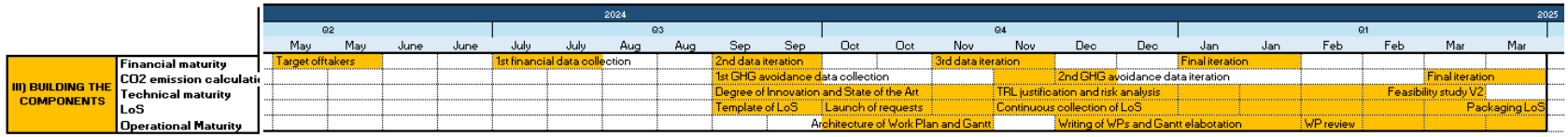

Figure 6: Planning 'Building the components'

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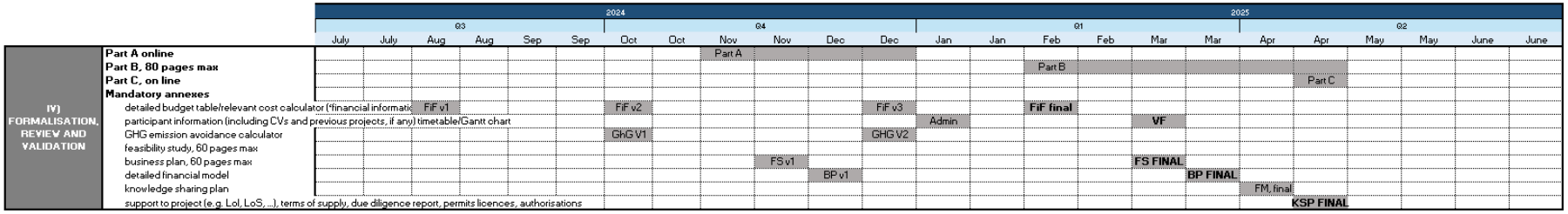

Figure 7: Planning 'Formalisation, review and validation'

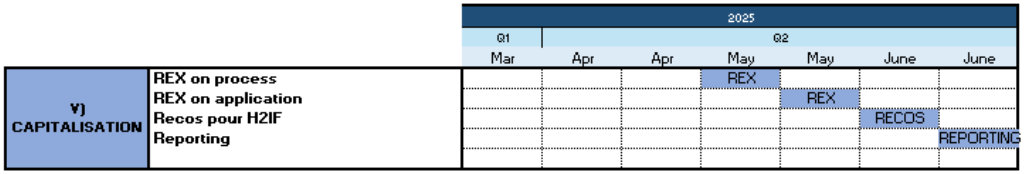

Figure 8: Planning 'Capitalisation'

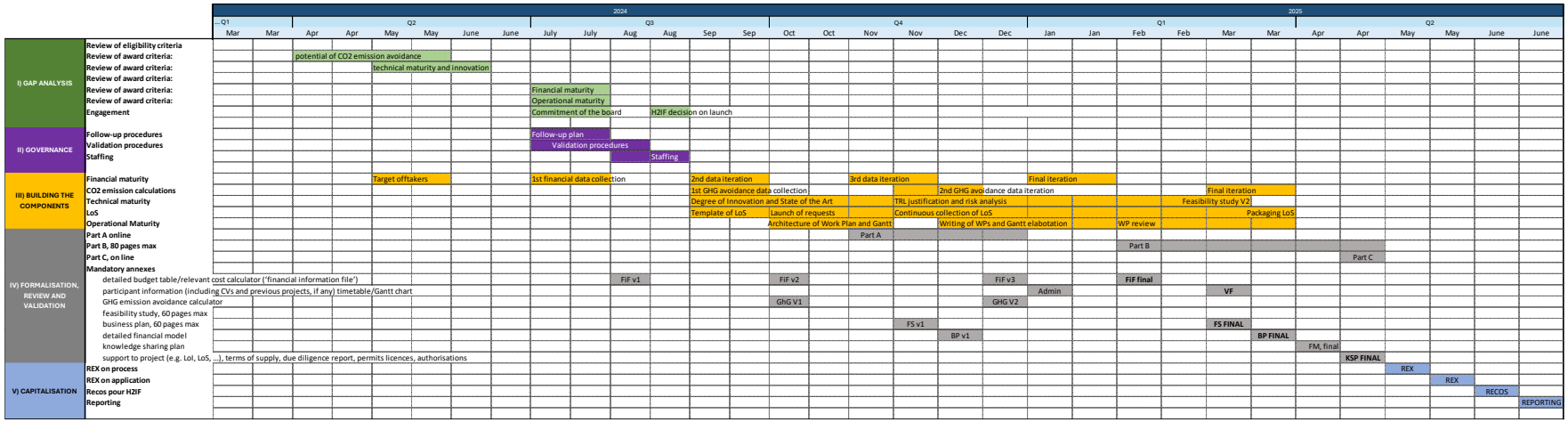

Figure 9: Typical macro planning in five stages for preparing an IF application

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5.2. Content wise, two annotated templates for the Feasibility study and Business plan

Two detailed templates (**Feasibility study** and **Business plan**) are provided to the future IF applicants. Note that:

- the **templates' structures are generic** enough to be used for any sector or product
- **specific guidance** is added in form of annotations with regard to the **hydrogen and storage** applications.

The templates cover all items requested in the IF application guidelines from the last call, organised in a structured and detailed manner. They also capitalise on the experience of the H2IF consultants.

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6. Leveraging upon the knowledge gained by more mature, selected IF projects

The knowledge sharing report of the EC services[7] provides valuable insights on how selected IF projects once selected and in their route to financial closure are facing challenges of various kinds: permitting, regulatory, securing finance and other technical constraints and possible mitigation strategies. The report also offers a detailed analysis of the portfolio of projects organised per domain.

As far as we are concerned two specific chapters focus on 'projects with a 'Hydrogen component' and projects with an 'Energy storage component'. Future applicants to IF calls in these domains are recommended to get into this capitalisation work that include:

- The mapping of the number and types of projects, level of IF contribution and total CAPEX, location countries.
- The nature of challenges and some strategies adopted and adapted to effectively address them.
- The level of cumulative GHG emissions avoidance per type of project, and over a 10-year period (for example battery manufacturing related project, demand response initiatives, integrated energy storage flexibility solutions; renewable / low carbon hydrogen, etc.).

The information could be used to position the applicant project within the portfolio of projects being awarded by the IF instrument and much more mature.

[7] see references [1][2][3], [1] being the most recent one released in 2024 -. Annual knowledge sharing report of the Innovation Fund –

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7. Feedback loop with applicants

The procedures and templates developed here are based on the 2023 IF Calls' information and the experience of the H2IF consultants. An update process of these elements is planned according to the following sources of information:

- Any possible changes in the official IF guidelines and templates for the 2025 and 2026 calls
- Feedback from H2IF applicants and consultants after the IF submission foreseen in 2025, and possibly 2026
- Material developed by 'sister projects' dealing with similar objectives (public deliverables and tools) and exchanges with the related consortia.

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8. Conclusions and inputs to ‘Innovation pipeline’

At the current stage of H2IF project development we have gathered some useful information to launch the preparation of an Innovation Fund proposal: timeline, annotated templates to guide the applicant. These elements, updated according to the feedback mentioned in the previous section, will feed the activity “Innovation pipeline" aiming at such capitalisation framework.

At that stage consultants discussed the opportunity to design a self-assessment tool for Horizon related project results wishing to apply to Innovation Fund programme. Recurrent questions shall be answered. Once synthesised, and reorganized into main units, the design of such a self-assessment tool emerges. Seven main units must be assessed to build confidence on the *ex-ante* eligibility of the concept. Each unit includes one or several questions whose answers could be assessed by a mark. The methodology to allocate a mark could be further detailed in the coming tasks of H2IF related to the ‘Innovation pipeline’.

This analysis will also avoid engaging resources to an application with low chance of success to the IF funding.

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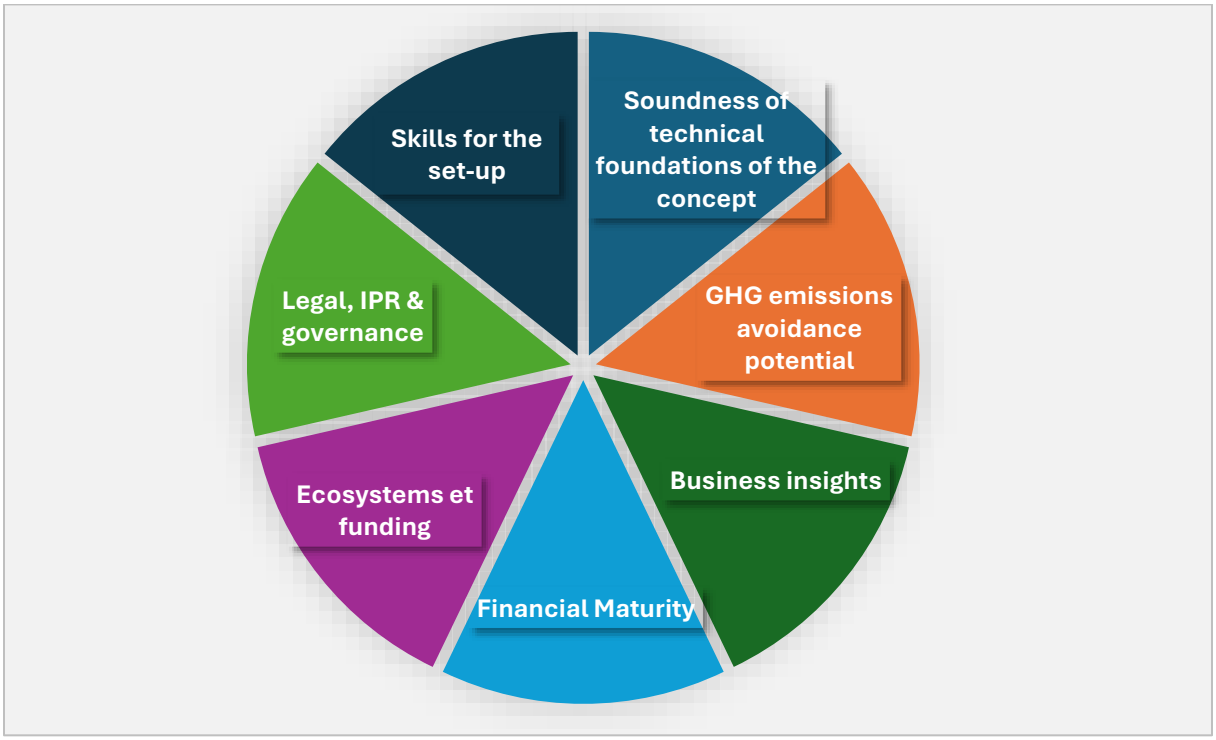

Figure 10: Framework for a self-assessment tool for Horizon type results in seven main units

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9. References

[1] European Commission, European Climate, Infrastructure and Environment Executive Agency, Przadka, A., Sales Agut, C., Bravo, B. et al., *Annual knowledge sharing report of the Innovation Fund – De-risking innovative low-carbon technologies*, Publications Office of the European Union, 2024, **https://data.europa.eu/doi/10.2926/895296**

[2] European Commission, Directorate-General for Climate Action, *Innovation Fund progress report 2022 – Report from the Commission to the European Parliament and the Council on the implementation of the Innovation Fund in 2022*, Publications Office of the European Union, 2023, **https://data.europa.eu/doi/10.2834/542568**

[3] European Commission, Directorate-General for Climate Action, *Innovation fund progress report – Report from the Commission to the European Parliament and the Council, August 2022*, Publications Office of the European Union, 2022, **https://data.europa.eu/doi/10.2834/58165**

[4] Innovation Fund portal

[5] What is the Innovation Fund?

[6] Innovation Fund Calls for proposals

[7] Innovation Funds projects

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Annex I – Annotated template for a Business Plan

See separate document ‘BP’

Annex II – Annotated template for a Feasibility study

See separate document ‘FS’

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H2IF – Bridging Horizon 2020 to Innovation Fund

Annotated template for the Business Plan to be included in the Innovation Fund application

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Preliminary observations and instructions for the reader

The current document proposes a structure for the Business Plan (BP). It is annotated with coloured boxes inserted in the text.

- Boxes in blue colour background include practical hints for applicants in the H2IF domains (energy storage, hydrogen), while
- Boxes in green colour background refer to the application template (part B) in which some of the information must correspond. This also enables a consistency and completeness check between the two documents (BP and part B).

The first green box applies to the BP as a whole.

Link to the application template (part B): The financial maturity constitutes the section 3.2 of part B form, in which a detailed overview of the financial maturity of the project is to be provided. The current BP shall support this section.
Some instructions appear in the part B template, they have been considered and re-dispatched in the current proposed annotated template.

The BP is a mandatory document that should cover the entire lifetime of the project.

Acronyms

BP	Business Plan
FS	Feasibility Study
FIF	Financial Information File
CAPEX:	Capital Expenditures
OPEX:	Operational Expenditures
WACC:	Weighted Average Cost of Capital.

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1. Executive summary

One page synthesis of the business plan.

This section shall be written in the end, once all sections have been completed.

Link to the application template (part B): Please make sure that it is consistent with other components (part B – project summary) and other components - financial model summary sheet.

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2. The project

2.1. Rationale: need served, value proposition

A problem-solving approach is appreciated which implies starting with the presentation of the problem solved/ market need served by the IF project.

Then, still driven by the demand or the market need, the applicant could focus on the description of the value proposition, and related product/services developed.

NB: the formalisation of a value proposition dedicated to a target underlies the fact that there is a market, either existing or emerging. Providing quick features:

- on the origin of this market, its drivers, how big it is and its dynamics
- on established competitors
- on what would be the type of positioning strategy that will be adopted by the company.

For applicants in the H2IF-related domains, please make sure to distinguish the roles of user and the customer. They may be distinct, or not.
Be clear on the type of offer: product or service.

More specifically **for storage solutions** an initial check could be to assess the adequacy of the storage solutions with respect to the claimed use cases.
Another verification could concern the environmental impact of the components required by the solution, the security of operation and possible end-of-life drawbacks that could offset the benefits in terms of GHG avoidance potential.

2.2. Facilities

This part will describe the facilities (location, size and duration) and the ownership of facilities.

2.3. Project planning

This section should introduce the key steps and scheduling of the project, with specific dates (project start date, construction period, entry into operation, end of the project).

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2.4. Potential for replicability

This section should describe the capacity of the project to be enlarged or replicated somewhere else and explain why the proposed scale is the most appropriate to reach the objectives of the project.

These elements refer to - and have to consistent with - the technical feasibility (part of the project maturity: see also section 3.1 of the part B template).

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3. Counterparties involved

Main project counterparties (description of who they are and overview of key financials) are described here in the form of a Project Diagram.

Link to the application template (part B): See the example provided in the part B template, section 3.3 (operational maturity)

We suggest using the very same diagram to document this section (or simply to refer to it) in order to focus more in-depth to the description of the applicant(s) specifically and referring to other similar activities carried out by the applicant(s) in the past.

It should be noted that in part B template there is a dedicated section in 3.3 to the "Project management team and project organisation", the latter complementing the project diagram.

The diagram will highlight the relationship between the different project parties and the project including shareholders, lenders, off-takers, other contractors, advisors, and insurers.

The description of competences and the profile of the team members is recommended to support the credibility of the business plan.

This should include all applicant(s).

For applicants in the H2IF-related domains, please insist on the track record of the management team (of all applicants) in the sector and on references in the domain.

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4. Market assessment and positioning

4.1. Market analysis

Describe first the market segmentation. A tree type visual could be used to illustrate the criteria used to map the market. Then, for each segment describe the key customers and the value the innovation will deliver compared to other solutions, as well the drivers for growth.

Once this qualitative description is provided, a central input is the estimation of the market size in terms of potential and target customers. One should detail:

- Market potential, demand/supply trends,
- competitors' overview,
- positioning of product/services with respect to competition,
- market uptake strategy

To clarify the positioning one could use a 2-entry table format to characterise the product X matrix relationship.

- In columns: products or service offer (P1, P2, S1, S2, etc.)[8]
- In rows: the market segments identified here above
- At the intersection of each cell: a characterisation of the relevance, or of the calendar of release, or any marketing feature.

A SWOT diagram or a Porter Five Forces analysis could document the strategic positioning of the offer and visualise the market entry barriers and more generally factors that could facilitate or slow down the future activities.

For applicants in the H2IF-related domains, the scope of the domain, and the market segmentation is a key element to explain in a pedagogical manner the intrinsic complexity of some energy related markets, some of them possibly not existing yet.

[8] P1 refers to the first product, etc.

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4.2. Marketing strategy

Marketing strategy at wide includes several items such as the **pricing policy** (cost based or acceptation based, existence of basic/premium offers, portfolio of offer and calendar or releases), the **distribution strategy** and all aspects related to the sale force, the distribution agreements, the **marketing and promotional strategy** and budget.

For applicants in the H2IF-related domains, pricing strategy involves uncertainty. Its management shall be clearly presented.

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5. Operations and consequences on the associated financial model

This section refers to the description of the production process (section 5.1) and on the consequences on the different financial streams of the financial file (FIF) (section 5.2).

Link to the application template (part B): Instructions are given in part B for the BP.

They mention the necessity to document in the BP the assumptions "made on the breakdown of expected revenues (including evidence of potential off-take contracts), capital expenditure (CAPEX), operational expenditure (OPEX) — including detailed justification of contingencies if any, in CAPEX and OPEX — and fill the financial model summary sheet (part of the financial information file - FIF) with the projected data coming from your own financial model".

5.1. The production process

This section details all activities and resources to produce the value proposition, the description of the necessary internal capabilities but also possible cooperations if relevant.

The production process should be documented:

- *What will be manufactured and how? (in house, externalised)?*
- *What will be purchased?*
- *Which purchasing policy for suppliers?*

For applicants in the H2IF-related domains, any techno-economic model supporting the production process and its potential value will be useful to document the relevant costs and the financial model discussed below.

Where relevant, purchase agreements for electricity/heat of renewable origin, bio feedstock sourcing and supply, CO2 storage or similar must be included here.

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Link to the application template (part B): All details related to the strategy for securing supply and off-take contracts and other key commercial contracts for the operation phase and its state of development hall be provided here.

It is also recommended to set out the main terms of the supply, construction and off-take agreements (where available), or terms of memoranda of understanding (if any), as well as to explain the technical, financial and commercial standing of contractors, suppliers and off-takers, including their track-record and credit rating (where available).

Conclusions of the due diligence reports produced by independent parties might be used if relevant to support the narrative.

5.2. Consequences on the financial model

The key definition of 'RC' as "Relevant Costs" is reminded: they are defined as the net extra costs that are borne by the project proponent as a result of the application of the innovative technology related to the reduction or avoidance of the greenhouse gas emissions.

Applicants should detail in this section:

- General assumptions of the model (e.g., inflation, relevant cost methodology, project lifetime, etc.);
- The revenues in terms of volume and price;
- The CAPEX with all eligible components (e.g. construction costs, site infrastructure costs, possibly including land for the site depending on the property leasing, development costs and intangible assets of the project);
- The OPEX (feedstock + operation and maintenance, possibly decommissioning if in the 10 years period, but no depreciation cost of CAPEX), and other costs;
- The maintenance CAPEX if applicable.

For each item above, please remember to describe and justify the underlying assumptions used (including assumptions on price, volumes, inflation used to derive project revenues, etc…), including scaling up and replication assumptions used to perform the revenues projections.

A special attention shall be given to the CAPEX since specific process depends on the stage:

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- Before entry into operation CAPEX are included in the relevant cost computation and are undiscounted
- Capex incurred after the date of entry into operation can only be maintenance CAPEX and will be discounted
- Costs incurred before the date of submission of the application are non-eligible costs.

For applicants in the H2IF-related domains, consider as much as possible the regulatory context of energy storage or hydrogen and the consideration of possible evolutions. The consideration of existing roadmaps on Hydrogen or energy storage include date providing orders of magnitude of industrial deployments.

Indeed regulatory environment is especially suited to market projections, market and entry, and other potential barriers or blockers.

For storage, one must bear in mind that the link of policy and regulatory signals is a big part for energy storage that aims to deliver long duration services given their current infancy
Another critical point is the existence of contingencies related to the existence of infrastructure (e.g. Hydrogen transport or distribution infrastructures) to make the project viable.

Applicants have to refer to:

- the 'Methodology for Relevant Costs calculation, Annex B of the call for proposals or the Relevant Costs Methodology, document regularly updated
- the 'Relevant Cost calculator' template which includes several spreadsheets and more particularly: the Capex inputs and Relevant costs
- the instructions for BP in part B template section 3.2 which are re-dispatched in this document.

The two boxes below provide an overview of what shall be in (first box) and out for the Relevant Calculation Cost process (second box).

For more details a video tutorial on FIF is also available for applicants here.

What costs should be included in "Capex Inputs" sheet and as Opex under the "Fin Model Summary inputs sheet"?

Capex after entry into operation should be regarded as Maintenance Capex and will therefore be discounted.

Construction cost: All cost linked to design, engineering, procurement, construction, commissioning and testing of the project such as: Costs of employee benefits arising directly from the construction or the acquisition of the item of property, plant and equipment; Equipment Cost, Costs of site preparation; Initial delivery and handling costs; Installation and assembly costs; costs of testing whether the asset is functioning properly, after deducting the net proceeds from selling any items produced while bringing the asset to that location and condition; Certifications expenses for necessary repairs during the construction phase; Expenses for removing hurdles on the site (however costs associated with replacement of existing technologies should be excluded); Land lease cost capitalized during construction.

Site infrastructure cost: Include Purchasing land; Expenses incurred to obtain or maintain authorization (e.g. license, filing, notarization or registration).

Development cost: All costs and expenditures incurred that are specifically required for the development activities of the project: Permitting and environmental assessment; Planning, design, engineering, start-up and testing; Legal, insurance and other advisors expenses; Staff costs linked to day-to-day development activities. Professional fees and fees for environmental permits.

Intangible assets: Include licensing of patents/intellectual property from a third party by the project developer in order to introduce innovation into Member State for demonstration[1]

Examples of items which should be excluded or are not impacting the Relevant Cost Calculation:

Other State Aid, notably in the form of fiscal or parafiscal measures, must be included in the financial model and may potentially impact the Relevant Costs computation, for example if they impact the projections for revenues or OPEX

Public support: As a general principle, applicants must include in their financing plan any public support to which a project has a potential right, being it project specific or equally applicable and accessible to all market participants on a market wide basis (such as a feed-in tariff or feed-in premium) in the Financial Model Summary Input sheets. Such public support will not impact the relevant cost calculation result.

Financing-related Costs: Any costs linked to the financing of the project are excluded from the Relevant Costs computation. A non-exhaustive list of such costs is the following: interest during construction, working capital needs, bank fees, legal fees, upfront fees, commitment fees, interest payments, additions to the maintenance reserve account or debt service reserve account.

Other excluded items Costs incurred before submission of the application; Terminal value; Training expenses; Advertising and marketing expenses (e.g. for introduction of new product or service); Costs linked to any corporate reorganization including establishment of new entities; Costs associated with any stranded assets (e.g. for the replacement of existing technologies or assets); Royalties paid to project shareholders VAT, taxes, etc.

For applicants in the H2IF-related domains, the volumes of the physical flows have to be consistent with the plant / site capacity and realistic with regard to the market expectations. All technical, capacity, cost, and revenues assumptions have to be aligned.

The cash flow projections of revenues and costs are calculated in the financial information file to support the project business viability that are measured by financial indicators such as NPV and IRR (before and after the requested IF support).

A key point requested by the call is to analyse the sensitivity of the cash flow projection and project profitability to identified risks that could impact the financial viability (see section 6 and section 7.5).

Link to the application template (part B):
In section 3.2 a dedicated section 'Detailed cash flow projections and project profitability' shall be documented with the following instructions:

"Fill in the financial model summary sheet (part of the financial information file) with the output of your financial model including a summary overview of the cash flow projections from revenues and costs, down to free cash flows (including cash from operating, investing and financing activities), the key elements of the P&L (revenues, costs, down to net income) and balance sheet.

Provide your detailed financial model sheet with detailed information on model assumptions and calculations to derive the financial projections (mandatory). The projections should be consistent with the detailed calculation of relevant costs in the relevant cost calculator to be submitted as part of the financial information file.

Describe the project's business viability measured by the project's Net Present Value (NPV) and Internal Rate of Return (IRR) before and after the requested Innovation Fund support, estimated over the expected lifetime of the project. Explain the WACC used for the analysis with details of the underlying assumptions and justify why the assumed debt-to-equity ratio expected for the project is achievable.

Estimate and explain the sensitivity of the cash flows and project profitability (for example NPV or IRR) to the key risks identified which could impact the financial viability of the project."

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6. Financial risk management

A typology of risks and a risk assessment with mitigation measures have been detailed in the FS. Here a quick reference could be reminded (e.g. the heat map9) also including sensitivity analysis (detailed in section 7.5).

The applicant should detail here all the business and financial risks of the project (unpayments, delays, missing provider, missing resources, commitment not accomplished that can involve penalties, etc). The point is not to show that the project is risk-less, but that a thorough assessment has been performed and all risks have been taken into account.

In such paragraph, the applicant can report all these risks by indicating, e.g.:

- The identified risks
- Where/how they would impact the project
- Their likelihood/impact (e.g., with a numeric score)
- The mitigation measures proposed for each of them
- A heatmap displaying all business and financial risks
- Any other descriptive items (e.g., risk management approach of the project team, previous experiences, etc.).

[9] see guidelines provided in the feasibility study

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7. Financing

7.1. Financial maturity of investors

In this section, the applicant should describe the financial maturity of the investors involved and support of the parent companies or shareholders (then make reference to the respective annex).

Link to the application template (part B):
In section 3.2 a dedicated section 'project funders and investors commitment' shall be documented with the following instructions:

"Describe the status and degree of advancement in securing funding sources, including equity, debt and funding support from Member States or other types of public support. Describe the nature, level/amount and conditions of support provided from project funders and how the funds will be injected into the legal entity owning the project and the ownership structure.

Provide credible supporting documents as attachments to the business plan, such as letters of commitment signed by the board of directors, as mentioned [...] in Financial maturity – overview).

Describe the financial standing of the project shareholders. As appendix in the business plan, include cash flow, profit and loss account and balance sheet statements over the last three years (consolidated or social accounts).

For all projects, but especially for projects with low profitability and/or exposed to high financial risks, provide credible evidence from the project shareholders that they will support the project to reach operation and cover potential shortfalls during operations."

7.2. Financial timeline and milestones

Remind here the timing of the project and its impact on the financial maturity of investors:

- the projected financial close and main steps to achieve it, as well as
- the allocation of financing including IF grant across the project milestones.

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7.3. Financing structure

Detail here the nature of the various financing sources used: equity, debt or combination. Show the overall evolution during the project life. Remember to include the IF grant and its distribution over time.

7.4. IRR and NPV before and after the IF Grant

Financial indicator: WACC (with the details of calculations) and value creation (comparison WACC with IRR), IRR and NPV before and after the grant.

Three outputs are expected: Profit and Loss account, Cash flow statement with uses and sources, details of financing sources with key terms, and ideally balance sheet

These tables target two populations:

- Potential lenders: will your business generate enough cash flow to pay back the loan?
- Potential investors: how much return can they get out of this investment?

For applicants in the H2IF-related domains, the internal WACC **used by** companies **will probably** be different from the WACC recommended by the IF application

7.5. Sensitivity of these indicators to the financial viability of the project

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Link to the application template (part B): In section 3.2 a dedicated section 'financing plan' shall be documented with the following instructions:

"Describe the project financing plan, including a description of type, sources and use of funds (amount and source of equity/shareholders loan, amount and source of debt, expected public subsidies and their source). Fill the expected funding uses and sources in the financial model summary sheet (part of the financial information file). Please describe how the equity will be injected (if applicable, list any intermediary legal entities with their country of residence).

Describe how the project will be financed if there are negative cash flows at project start or during operation. The financing plan must be consistent with the milestones described in section 7.2 to ensure that the project can cover the costs expected to be incurred during implementation in a timely manner.

Explain how the expected allocation of the lump-sum breakdown for the grant will be proportional to the activities and efforts related to the relevant work-packages and project milestones explained in section 7.2.

Present and explain the financing structure of the project. If the project is planning to raise external debt, explain whether the debt will be raised at the level of the corporate entity or of the project, and the level of recourse to the shareholders. Ensure that the key terms expected are justified by the project risks, projected cash flows and in line with market standards (notably but not limited to tenor, margin, D/E or DSCR). If possible, provide letters from banks and/or debt investors to support expected terms.

Explain the planned date of financial close, including a description of milestones that have already been reached, as well as the outstanding tasks. Provide all necessary information to demonstrate the project's ability to reach financial close within 48 months or faster after signing the Grant Agreement. Detail the main conditions to be fulfilled before final investment decision can be reached and explain how the expected project financing sources will be made available."

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8. Annexes

A1. Financial annexes

Cash flow statements, profit and loss account and balance sheet for the last three years (consolidated or social accounts) of project shareholders.

To be provided in a separate file.

A2. Contractual annexes

Main terms of supply, construction and off-take agreements and other key commercial contracts for construction, operation phase and its state of development.

To be provided in a separate file.

A3. Other annexes in support of this business plan

Any documents indicating support for the project (e.g., letters of interest, letters of support, letters of approval from funders, letters from shareholders or board).

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H2IF – Bridging Horizon 2020 to Innovation Fund

Annotated template for the feasibility study to be included in the Innovation Fund application

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Introduction

Feasibility Study is a mandatory annex and constitutes a key piece for the evaluation of the degree of innovation, and the technical and operational maturity of the project. Applicants will be required to consolidate and formalise arguments and evidence from various origins such as diligence reports, procurement quotes, MoU, LoI, LoS:

- explain the actual degree of technology readiness of the proposed solution and the technical feasibility of delivering the expected output in a factual (if possible quantified) and concise manner
- provide elements for the credibility and level of detail of project implementation plan based on a realistic timeline covering all project milestones & related deliverables and consistent with technical and financial features of the application
- describe the risk and mitigation strategies carefully addressed and supported by a set of contractual evidence.

The current document proposes a draft template with some indications to guide the applicant.

It is reminded that consistency between application documents[10] shall be ensured,

In blue colour in a box in the template below we added some more specific hints and recommendations for applications to the **H2IF-related domains** (Hydrogen, energy storage),

while the generic recommendations are indicated in black colour.

[10] Feasibility study, business plan, GHG calculations.

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1. Problem solved and innovation

A problem-solving approach is recommended to introduce the project objectives.

For applicants in the H2IF-related domains, the framework of the strategic objectives of the EU on the green and digital transitions of the economy, industry and society, and the climate neutrality in Europe by 2050 shall be reminded to introduce the project objectives and its contribution.

1.1. Description of the problem solved / need served

1.2. Description of the innovation and value proposition

1.3. Project objectives

Applications dealing with major energy infrastructures that might be disruptive in the sector need to provide a strategic analysis on how they will be game changer, possibly in conjunction with other energy infrastructures (generation, transport, storage or distribution)

2. Project description

This section focuses on the description of the project in its geographical, industrial context and socioeconomic context. Background information, resource and feedstock availability and yield potential and innovation have to be detailed considering the project objectives formalised at the end of previous section.

For applicants in the H2IF-related domains, the issue of social acceptance or of any NIMBY aspect of local population due to discomfort, industrial or environmental hazards and other inconveniences need to be particularly addressed. All proof for obtaining agreements for the plant site and authorisations should be presented.

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2.1. Location analysis and strategic overlook

2.1.1. Plant location and site description

2.1.2. Feedstocks and resources

2.1.3. Social acceptance and stakeholders' involvement

2.2. Expected project outputs

3. Technical maturity assessment

This section aims to describe the operational factors that may influence the success of your project: these include technological features but also surrounding aspects such as the supply chain or the manufacturing process.

Assessing technical maturity includes the evaluation of various aspects such as technology readiness, technology process, suppliers of technology, feasibility of achieving project outputs

3.1. State of the art (SoA)

The SoA shall include technological aspects of the solution. It has also to consider commercial aspects such as the development of a new market.

Categories of the SoA have to be designed according to the type of technology and the industrial sector and value chains the solution might impact. An illustration of the architecture of a SoA is proposed below for a case in 'Hydrogen storage'.

Table 3: Illustrative organisation of data collection to build a SoA for a particular case

State-of-the-art categories		**The distinctive value of the proposed solution in comparison to the SoA[11]**
Hydrogen storage	- Overview of underground reservoir solutions for industrial hydrogen storage	

[11] Explain how it differs from other current/recent projects (size, location, etc.)

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	(salt caverns, depleted oil and gas caverns or aquifers). - Overview of hydrogen storage technologies other than caverns.	
Salt caverns	- Inventory of salt caverns in operation in 2024 (Europe, outside Europe) - Status of salt caverns under construction for commercial operation in 2028 - R&D or demonstration projects recently completed or underway (Life, Horizon, other instruments or not publicly funded: description, objectives, sites, TRL) - the applicant position in this state of the art	
H2 transport infrastructures	- The prospect of hydrogen transport backbone networks (in Europe, in Germany near the target site)	
Regional impact	Other initiatives covering the needs in the regions impacted by the solution	Analysis of regional impact of the solution to local industry and economy

3.2. Innovation beyond state of the art and technology readiness

Performance indicators could be used to quantify the technical performances of the solution with respect to the State of the Art.

More generally the solution could be characterized in terms of costs, performances and technical characteristics, maturity levels (TRL, MRL). The KPI shall be compared to the SoA data, which implies a careful selection of comparison parameters. Energy efficiency and circularity could also be considered to support the comparison if useful.

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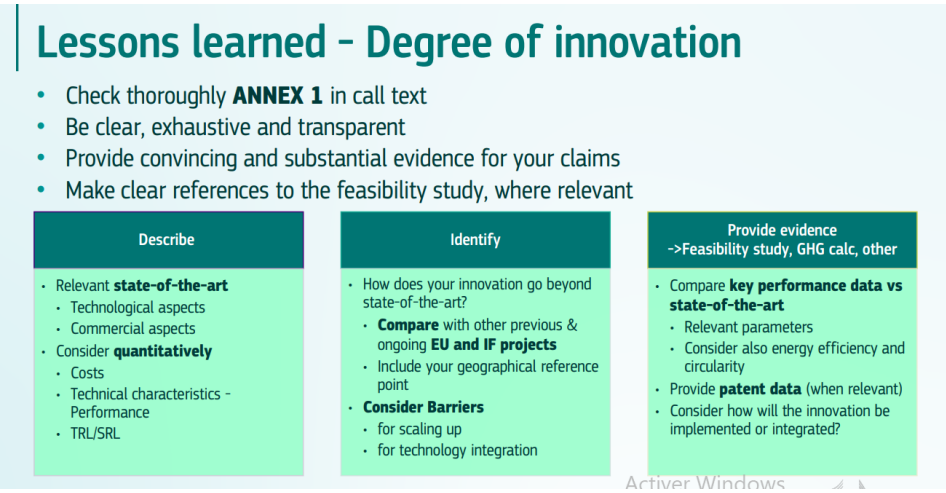
State-of-the-art also based on geographic element.



The step forward in comparison to the SoA must be characterized with regard to previous and ongoing EU and IF projects, also considering the geographical reference point of the projects.

For applicants in H2 or energy storage, applicants could also use multi-year technology and industrial roadmaps available in each domain to position the performance ambitions of their innovation (e.g. the MAWP for Hydrogen for which applications shall consider the KPI set in this plan).

Applications in energy storage shall present the added value with regards to other technologies including the techno-economic and environmental characteristics: e.g., time of charge, discharge, efficiency, cycling and ageing, energy density, electro-chemicals risks, capex and opex, considering mature or technologies in development

3.3. Degree of Innovation with respect to existing IF Project Portfolio

Compare project proposition to existing IF funded projects taking into account the following elements: i) technology type, ii) sector iii) size of project and iv) geographic element.

3.4. Feasibility of achieving project outputs

Describe the previous performances of the proposed technology with evidence on results of testing at smaller/ previous scale. If relevant the MRL scale could be used.

Barriers for scaling up or for integration of innovation shall be detailed.

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4. Operational feasibility

This section is descriptive and should be documented by any relevant evidence: plans, permits, agreements for the site or purchase/cooperation agreements

4.1. Detailed description of the installation/ plant

4.2. Construction, operation and maintenance plan

4.3. Applicable legislation and permits

4.4. Supply chain/ procurement

4.5. Organisational requirements

4.6. Competences and resources

Overview of staff descriptions (it is reminded that information on staffing should already be included in the Participant Information File with team, position & background of staff members)

4.7. Protection of innovation and cooperation

Describe any measure taken to protect innovation (e.g., data on patenting if relevant).

Describe cooperation with partners, if relevant (cooperation agreements).

For applicants in the H2IF-related domain, the issue of supply chain for materials presenting scarcity risks or geopolitical uncertainty needs to be carefully addressed.

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5. GHG avoidance and key consumptions figures

5.1. Scope

5.1.1. Sector, product and GHG methodology

5.1.2. System boundaries

A brief introduction on the underlying assumptions to introduce the GHG emissions avoidance calculations.

5.2. GHG emissions avoidance calculation

This section includes description of the scenarios and justification of the main assumptions used. The results of the GHG calculator are synthesized.

The methodology to be used is detailed in ghg-emission-avoidance-methodology_innovfund_en.pdf (europa.eu).

The particular case of Energy storage is detailed in section 5 of the methodology document.

5.2.1. Reference scenario

5.2.2. Project scenario

5.3. Monitoring plan and data traceability

6. Sustainability of the proposed solution

6.1. Social impacts

In case of possible negative impacts, mitigation measures should be presented.

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6.2. Socio-economic impacts

6.3. Environmental impacts

Within or beyond the environmental impacts, the applicant could also mention other features widening the environmental analysis. For example circularity of components used in the project, impacts on biodiversity, impacts on local value chains, positive side / rebound effects, etc.

7. Technico-economic feasibility

7.1. Cost model with detailed assumptions

7.2. Revenue model with detailed assumptions

Applicants are required to document the way they address uncertainty in the above cost and revenue model to prove the technoeconomic feasibility. Mitigation measures to decrease such uncertainty or the commercial risk shall be detailed.

For applicants in the H2IF-related domain, major uncertainties could remain for projections of mid to long term energy prices, to the regulation of electricity markets opening or impeding possible sources of revenues (grid balancing, feed in tariffs, etc.) but also all incentivisation measures for decarbonization. Scenario approach with pessimistic or optimistic assumptions could be used to assess the 'commercial risk' formalised in the business plan and synthesised in this techno economic assessment.

8. Risks and mitigation measures

In this section, applicants have to describe the various risks identified, evaluate both their likelihood and potential impact, and explain the mitigation measures to be undertaken. Risks can be for instance of technical, procurement, regulatory, societal, political, security nature (the commercial risk was addressed in previous section).

It is recommended to use a Risk Matrix (or heat map) for the sake of concision. See for instance this link.

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For risks with higher likelihood and/or impact, both preventive and curative mitigation measures should be considered: preventive measures reduce the risk's likelihood before its potential occurrence, while curative measures reduce its impact one the risk has realised.

For applicants in the H2IF-related domain, major risk relates to regulation on storage (BESS, thermal, hydrogen) or for supporting new emerging technologies.

8.1. Risk management approach

8.2. Main technical and operational risks

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