



Project development assistance for regions (PDA II)

Title: Glidepath for hydrogen project development

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SPILETT
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Disclaimer

This paper details the glidepath from project proposal to project delivery for a regional hydrogen project.

The glidepath consists of an initial stage that produces a clear project proposal, a development stage that refines the initial proposal into a detailed project, and a final stage that produces a full project delivery plan. This information was prepared by deltaH2 as part of the activities in the „PDA II – Project development assistance for regions“ initiative to facilitate the development of local or regional hydrogen projects.

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Author

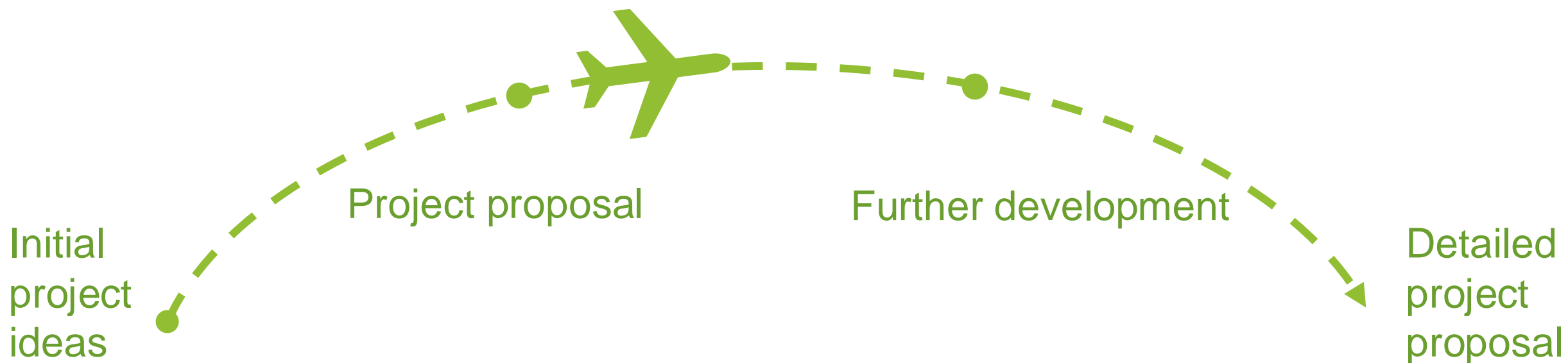


Contracting authority



Co-funded by
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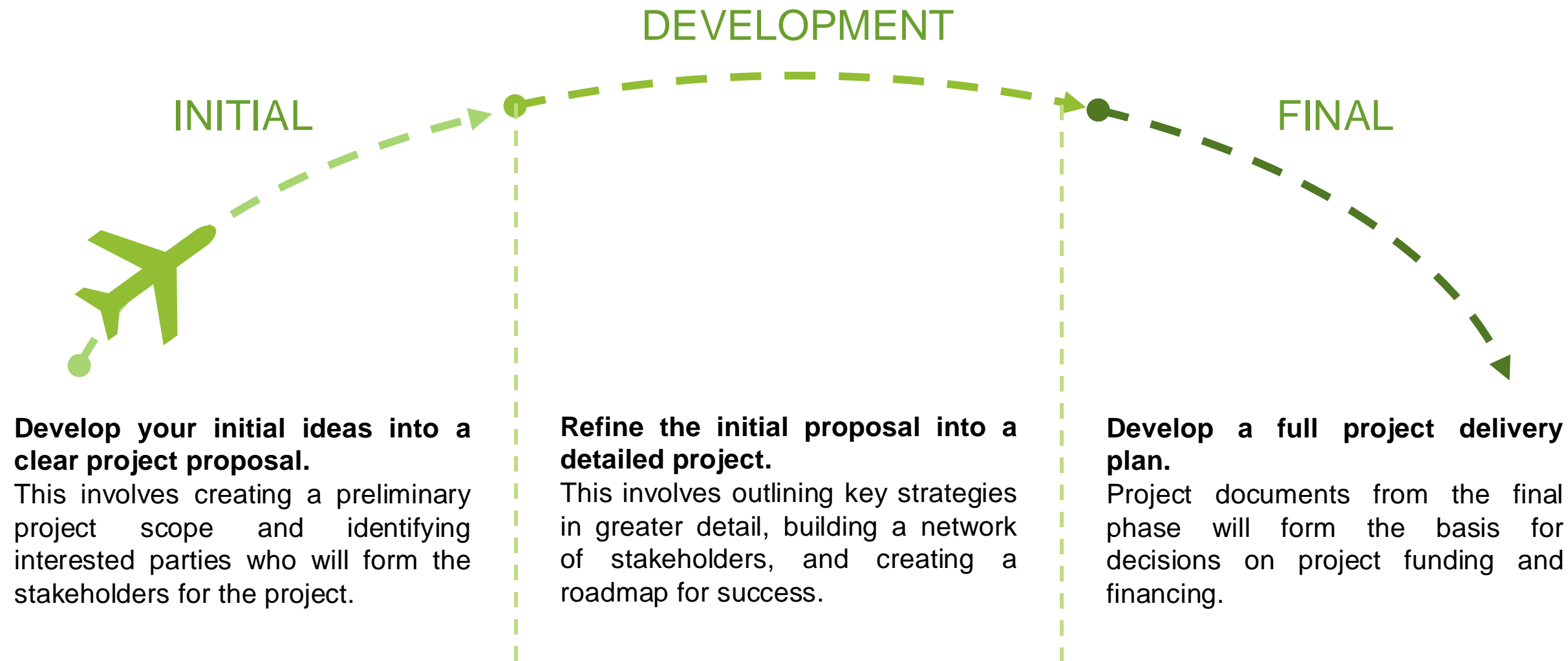
Motivation for a hydrogen project development glidepath



A glidepath provides a step-by-step process to achieve a goal. It provides a step-by-step guide to develop a hydrogen project from initial ideas to a clearly defined project proposal. It is a guiding framework which sets out a structured approach for the development of a regional hydrogen project.

The glidepath can be used by any interested group (local or regional governing body, industrial player, or collaboration of players) that wants to develop a local or regional hydrogen project. It is not designed to describe local, regional, or national challenges, but rather sets out a step-by-step checklist to frame understanding of what is needed at each stage of development and how to develop the project further.

The glidepath is divided into initial, development, and final stages representing increasing levels of project maturity



Initial project stage



Project components required for success

Initial stage

Documentation	<i>Documentation is needed to ensure that all stakeholders are aligned on the project plan and to provide continuity in the event of personnel change.</i>	Draft concept paper and contact information for all stakeholders
Project scoping	<i>Project scoping will determine details of the key elements of the project, including equipment sizing, technology choice and operational strategy.</i>	Select components of project and develop high level sizing
Stakeholders	<i>The project will require engagement with all stakeholders. This activity will develop stakeholder engagement strategies</i>	Identify key stakeholders and develop a project delivery team
Procurement	<i>A procurement strategy for the project is required to enable access to equipment on an appropriate timeline and at an acceptable price.</i>	-
Permitting	<i>Permits are required to deliver the project. Teams should engage early with local authorities and emergency services to avoid delays.</i>	-
Location	<i>A suitable location or locations will be found and secured for the project.</i>	-
Funding	<i>Funding is available across Europe to enable regional carbon projects. This activity will evaluate funding opportunities.</i>	-
Financing	<i>Capital investment will be required to deliver the project – A strategy for financing the project will be developed through this activity.</i>	Develop a high-level project budget

Initial Stage

Checklist for project scoping

Aim: Identify high-level project scope

- The region of the project has been decided (e.g., city, region)
- The core project components have been selected and justified (e.g. electrolysis, refueling station, type of vehicles, etc.)
- An indicative scale (e.g., size of electrolysis, number of vehicles) for the project has been set out
- A suitable timeline project delivery is set out with dates identified for milestones, such as final investment decision or start of operations
- SMART objectives are set out for the project: specific, measurable, achievable, relevant, and time-bound

Project scoping

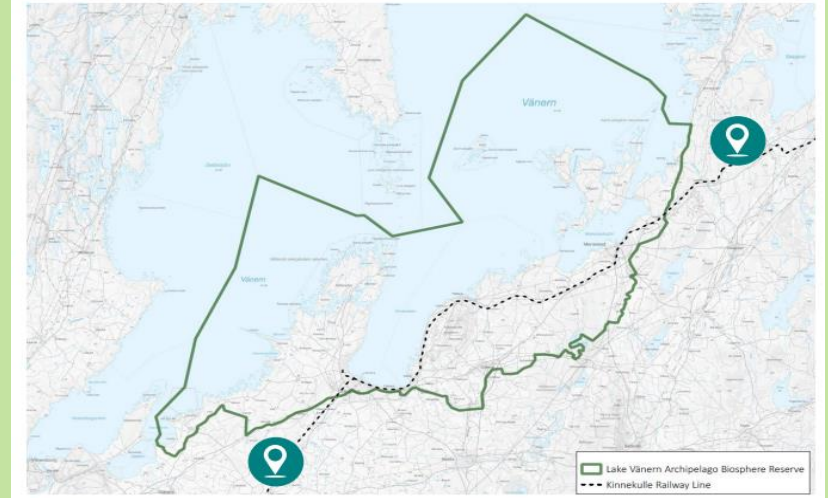
definition and requirements

This will be an outline of the scope of your project and what it aims to achieve. The high-level scope is the framework on which your project is built. This should include:

- **Objectives of your project**
- **Determining the geographical working area of the project**
Consider the entire hydrogen supply chain, including renewables sourcing (if using renewable electricity to make hydrogen), hydrogen production, storage, distribution, and end use.
- **Specify all components of the project and their scale (e.g. number of vehicles, tonnes of hydrogen production, green electricity capacity requirements)**
Calculations on project scale should be clearly set out and referenced.
Consult public sources for project equipment specs such as [Roland Berger's preliminary business cases for PDA 1](#).
- **Timeframe of your project**
Set out a timeline for the delivery of all aspects of the project, including dates for key milestones such as final investment decision and start of operations.

Mariestad, Sweden: location, scale, supply chain for hydrogen trainline ([PDA 1, 2021](#))

Decarbonise the Kinnekullebanan
(121 km single track commuter trainline)



Measurable outcome: A list of SMART objectives is provided (specific, measurable, achievable, relevant, and time-bound). Timelines for achievement of milestones are set out.

Project scoping

Local policy and regulatory context

Even well-developed projects are at risk without the right support from government. Before developing your project further, you should understand the local and national context of your project by researching regulations, policy, and strategy on hydrogen and decarbonisation. To begin, project teams should:

- **Develop an understanding of EU level policy and regulations**

The PDA II regions initiative has developed two papers exploring EU policies to support hydrogen projects and EU regulations for hydrogen projects.

- **Research national implementation of EU policies and regulations**

Member states are required to implement EU policies and regulations into national law. Once you have developed an understanding of relevant EU policies and regulations for your project, you should research the status of implementation in your country and the implications for your project.

- **Understand how the project fits with national and local strategy**

Projects can help to achieve national and local decarbonisation and air pollution targets: project teams should aim to understand what strategies exist and how the project can support their aims. This can help projects to access policy and funding support.

Links to the policy and regulation papers can be found [here](#).

For up-to-date information on EU hydrogen policies, review the Clean Hydrogen Partnership website [here](#).



Measurable outcome: Policy and regulations papers read by project delivery team.

Initial Stage

Checklist for stakeholders and financing

Aim: List stakeholders who can support project delivery

- A list of interested parties and potential stakeholders has been produced and their potential roles in the project identified. These stakeholders should cover all key aspects of the project (hydrogen production, transport, and end use)
- A project delivery team with named representatives from the key partners starts meetings on a regular basis
- A 'project lead' has been named, who will be responsible for coordinating the delivery of the project and organizing meetings

Aim: Develop a high-level project budget

- A high-level budget of the project is prepared based on the capital cost (CAPEX) of each project component, with sources for each capital cost (CAPEX) estimate provided.

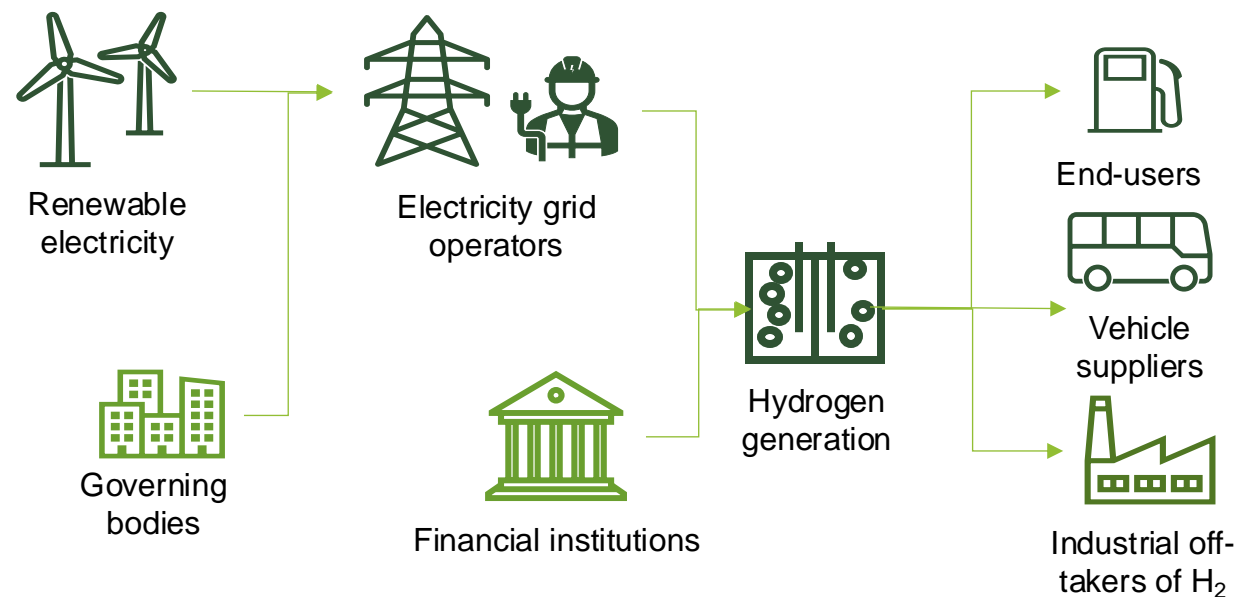
Stakeholders

listing and mapping potential stakeholders

Key stakeholders **who will be important for the delivery of your project** should be involved early in project planning. You should develop a list of potential stakeholders and form a project working group with a small group of key stakeholders. Regular meetings (e.g. monthly) of this working group should be organised.

Key stakeholders for your project may include:

- Renewable electricity suppliers
- Hydrogen producers
- Hydrogen end-users
- Industrial partners
- Research partners, e.g., universities
- Original Equipment Manufacturers (OEMs)
- Vehicle suppliers
- Local/ regional government bodies
- Electricity grid operators
- National hydrogen bodies



Measurable outcome: A list of potential stakeholders and their contact details is produced. A working group formed of a small number of key stakeholders (3-5 key stakeholders) should be formed and regular meetings organised.

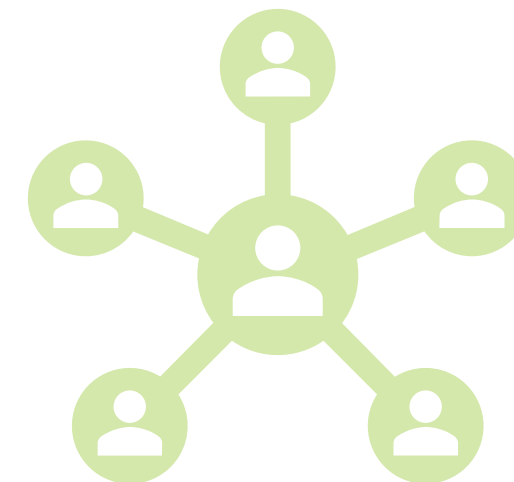
Stakeholders

Identification of a project lead

Once a project working group has been established, a project lead should be identified to coordinate this working group and the broader project. Experience indicates that a motivated project lead is a key factor in the success of hydrogen projects.

The project lead's responsibilities will include:

- Coordinating project working group and ensuring regular attendance of group
- Distributing project work among stakeholders
- Driving project progress among all stakeholders according to the defined timelines
- Maintaining project schedule
- Resolve project conflicts through arbitration and act as the final decision maker on project matters



Measurable outcome: A project lead has been named for the project to coordinate the working group and ensure project progress.

Financing

High level budget

A high-level budget will provide an approximate total capital cost (CAPEX) for the project which can be used to develop initial ideas on the project financing strategy. The figures used should be justified based on publicly available data, engagement with suppliers, or experience from other projects. The items included in the budget will be determined by the project scope.

At the close of PDA 1, projects prepared a webinar summarising their projects including short high-level budgets. The project summary slides, and webinar recording, can be found [HERE](#).

Likely items within PDA project budgets will include:

- Renewable plant capital cost (CAPEX)
- Hydrogen production equipment costs (e.g. electrolyzers of an appropriate size for the project)
- Fuel cell vehicles (for mobility projects)
- Hydrogen storage
- Hydrogen distribution equipment (if required)
- Project management and engineering costs
- Land acquisition costs

Example Capital expenses budget estimate from PDA 1 project: Sofia

Name	Capital expenditure			
	Value	Unit	%	Total/ €
Electrolyser Capital Costs	1 100	€/kW	37%	4 176 563
Hydrogen Storage Capital Costs	1 000	€/kg	11%	1 215 000
Hydrogen Compressor Capital Costs	1 500	€/kg	16%	1 822 500
Refuelling Dispensers and Chillers Capital Costs	500 000	€/unit	9%	1 000 000
Photovoltaic Equipment Capital Costs	500	€/kW	25%	2 847 656
Photovoltaic Installation Costs	50	€/kW	3%	284 766
Total			100%	11 346 484

Measurable outcome: A high-level budget for the project is produced and the figures produced have been validated by comparing to projects of a similar scale.

Initial Stage

Checklist for documentation

Aim: Develop a draft concept paper

- Write a draft concept paper including at least the following: A project description, a high-level budget, the project scope and scale, the project location (region) and project participants (key stakeholders involved in the project)
- Review the draft concept paper with the project delivery group and debate key topics.
- Extend the draft concept paper incorporating working group feedback and receive approval from working group members of the draft concept paper.

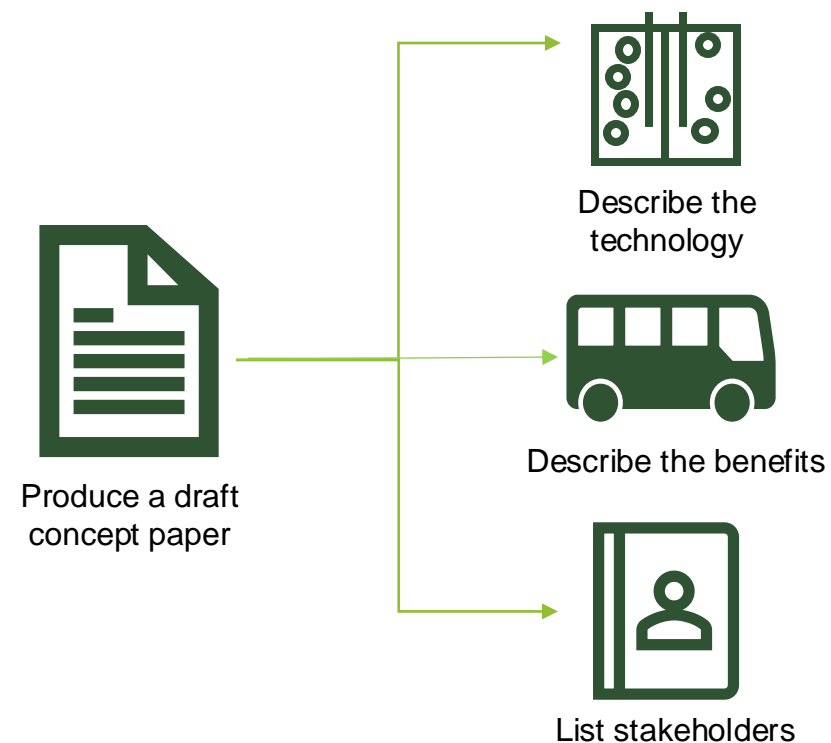
Documentation: definition and requirements

draft concept paper development

The project lead will develop a draft concept paper (~5 page) which will be reviewed by all key stakeholders within the project working group. The working group will debate key questions and agree on a concept to be brought forward to the next phase.

The following components will need to be included within the draft concept paper:

- Context: regional context, need for decarbonisation, and role of hydrogen
- SMART objectives of the project
- Project scoping:
 - Describe the core project components and scale of deployment (e.g., number of vehicles, MW of electrolysis capacity, etc.)
 - Location(s)
 - List of identified benefits (e.g. how many tonnes of GHG emissions will be prevented?)
- List of key stakeholders in the project delivery team and their roles
- High-level budget



Measurable outcome: A draft concept paper has been produced which has been approved by the project working group.

Development project stage



Project components required for success

Development stage

Documentation	<i>Documentation is needed to ensure that all stakeholders are aligned on the project plan and to provide continuity in the event of personnel change.</i>	Several 'working' documents
Project scoping	<i>Project scoping will determine details of the key elements of the project, including equipment sizing, technology choice and operational strategy.</i>	Validate project scope (e.g. component sizing) and cross-check consistency across all project components
Stakeholders	<i>The project will require engagement with all stakeholders. This activity will develop stakeholder engagement strategies</i>	Project delivery team meets regularly with clear structure
Procurement	<i>A procurement strategy for the project is required to enable access to equipment on an appropriate timeline and at an acceptable price.</i>	Develop a supplier database listing key equipment for the project and specifications
Permitting	<i>Permits are required to deliver the project. Teams should engage early with local authorities and emergency services to avoid delays.</i>	Identify permits required, lead times and application processes
Location	<i>A suitable location or locations will be found and secured for the project.</i>	Develop and rank a shortlist of locations to site project within the project region
Funding	<i>Funding is available across Europe to enable regional carbon projects. This activity will evaluate funding opportunities.</i>	Identify funds which will support the project business plan
Financing	<i>Capital investment will be required to deliver the project – A strategy for financing the project will be developed through this activity.</i>	Complete a Clean Hydrogen Partnership business plan

Development Stage

Checklist for project scoping and stakeholders

Project Scoping – Validating and refining project scope

- The core project components have been cross-checked to ensure that they are consistent with each other (e.g. matching the scale of components)
- Alternative technologies for components of the project have been assessed for use in the project and the most suitable technology selected (e.g. alternative electrolyser technologies)
- The core project components have been checked to ensure they enable the delivery of the project goals (e.g. the project will produce enough hydrogen to support the selected end use)

Stakeholders – Management structure established

- Roles and responsibilities of project working group members have been established.
- Handover and contingencies for staff absences have been planned.
- The project working group's governance structure has been agreed and decision-making responsibilities at each level of the working group structure determined.

Project scoping

Validate and improve the scope of the project

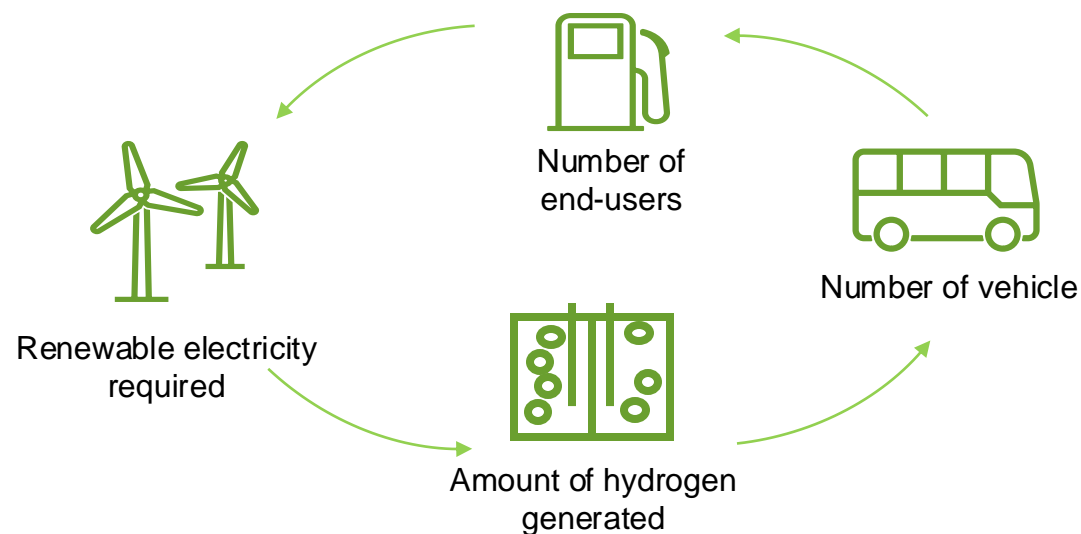
Critically assess the initial phase project scoping activity to ensure that the aims of the project can be achieved using the planned equipment and that the project design is realistic. All project elements developed in the initial phase should be reviewed to ensure consistency with one-another.

Cross-checking project elements will include, but is not limited to:

- Analyse the size of project components and ensure they are suited to meet the project targets (e.g. is the electrolyser large enough to produce the required mass of hydrogen per year?)
- Validate choice of project components against comparative technologies (e.g. investigate suitability of alternative electrolyser technologies on the market)
- The project budget is complete (all project equipment is listed within the budget)
- The timeline for the project has been reviewed and considers long lead-time items (e.g. permits and equipment procurement)
- Set out specific site requirements based on the project scope, including land available, power connections, road access, etc.

Cross-checking project component examples

The number of users of hydrogen buses deployed on a project should be matched to the number of bus users, and the amount of hydrogen generated.



Measurable outcome: Project elements have been aligned and validated against project goals. Alternative technologies for project components (e.g. alternative electrolyser technologies) have been investigated.

Stakeholders

Establishing a management structure

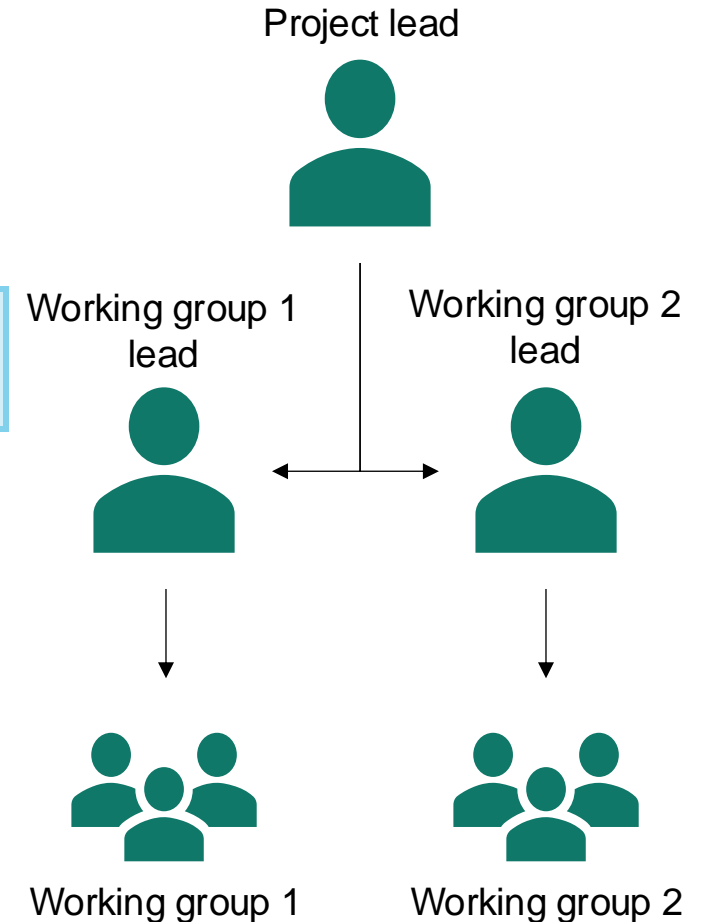
Explanation: The project working group developed in the initial phase will have clearly defined roles established for members and project responsibilities assigned. Roles will vary between projects based on project goals. Contingency strategies for project handover in the event of staff absence should be developed.

Measurable outcome: Roles and responsibilities of project working group members have been established. Handover and contingencies for staff absences have been planned.

Explanation: A structure for reaching decisions and arbitrating disputes within the project working group should be agreed. Final decision-making responsibility is recommended to rest with the project lead, but for larger projects, decision-making will need to be shared amongst the project delivery group and important decisions may need to be checked with senior people within the organisations involved.

Measurable outcome: The project working group's governance structure has been agreed on and decision-making responsibilities at each level of the working group structure determined.

Example project governance structure



Development Stage

Checklist for procurement and permitting

Procurement - Develop list of possible suppliers of equipment for the project

- A database of all key equipment for the project has been produced
- Procurement database includes performance-based specifications for each item of equipment
- Procurement database includes procurement lead times, possible suppliers, likely costs, and procurement strategy

Permitting – Engaging with permitting bodies

- A database of permits required for the project has been produced
- Permit database includes average lead time for permits
- Permit database includes pre-requisite conditions for permit application
- Permit database identifies how to apply to permits and the relevant regulatory body

Procurement: definition and requirements

Identification of key equipment

A database of key equipment will allow the project team to track the status of equipment procurement for the project and quickly find information to provide to equipment manufacturers. Information to include in the database will consist of:

- A list of all equipment required for the project using the be list developed in the [Initial stage - project scoping](#)
- Performance-based specifications for each piece of equipment (e.g. what temperature ranges will the equipment be operating in, how often will the equipment be used per day / per week, etc..)
- A list of potential equipment suppliers for each item required
- A validated indicative lead-time for supply of key equipment (lead times can be validated against using case studies of similar projects, publicly available sources, etc.)
- Validated indicative cost of key equipment for project budget (equipment costs can be validated against project budgets for similar scale projects, public facing figures from suppliers, etc)
- A procurement strategy to be deployed (e.g. if a public tender process will be used, identify the key steps to procurement and lead times)

Measurable outcome: A database of all key equipment for the project has been produced, detailing performance-based specifications, lead times, costs, potential suppliers, and procurement strategy



Electrolysers



Hydrogen Refuelling Stations

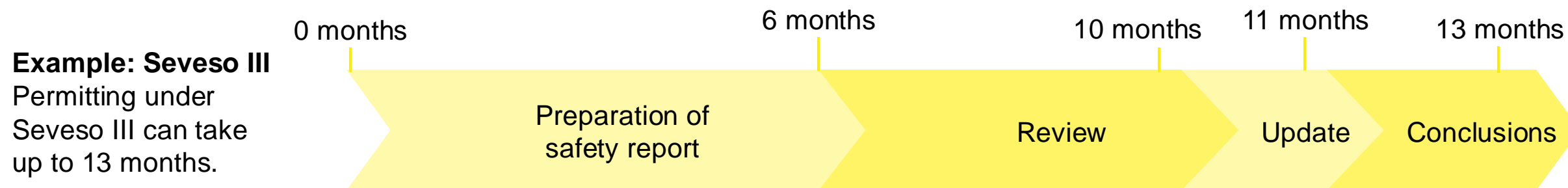


Hydrogen Vehicles

Permitting

Engaging with permitting bodies

Acquiring permits for projects may require long lead-times (over a year is not uncommon for some permits) and establishing the timeframe for permits is needed to produce realistic project timelines. Project teams should engage with national permitting bodies, to establish typical permit procurement schedules, and the requirements for each permit. This information will be used to develop a justified timeline for the project. PDA teams are recommended to reference the 'EU regulations for Hydrogen Projects' paper as a starting point for researching a list of required permits and licenses.



Measurable outcome: The project team will identify a list of permits required for the project. For each of the permits a data table with the following information will be produced:

- An average lead-time for the permit (time between application sent and receiving permit)
- The pre-requisites for permit application
- The national/local body responsible for granting the permit
- The cost of the permitting process
- The method of applying for the permit (e.g. Who are you sending your application to? What application forms are needed?)

Development Stage

Checklist for location, funding and financing

location - Sites identified

A shortlist of potential sites has been produced and first choice sites selected

Funding - List of potential calls

A shortlist of suitable funding calls for the project has been produced

Financing – Develop a business plan

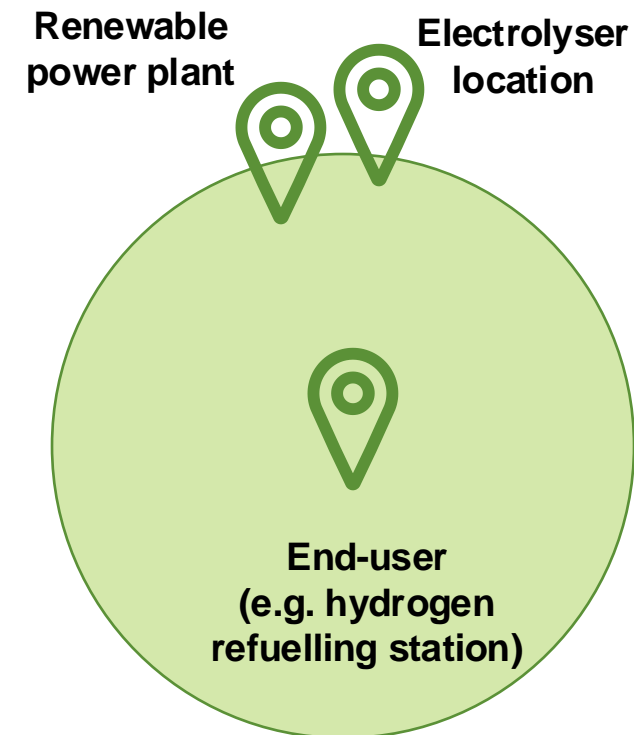
A full business plan has been completed for the project

Location

Identification of potential site(s)

Hydrogen projects will require at least one site for hydrogen production and/or end use. Depending on the type and scale of project developed, the project may utilise multiple sites, each with separate requirements. For example, large-scale transport projects may choose to produce hydrogen close to renewable energy sources and transport it to convenient refuelling station locations (e.g., existing local bus depots). In this stage, you should develop the following:

- Within your project area, identify locations that could meet the specifications developed in the project scoping activity for each required site for your project.
- Evaluate each location against the site requirement criteria developed in the project scoping activity to determine a ranked shortlist of locations.
- Select a 'first choice' and up to 3 backup sites for the project from your ranked shortlist.



Measurable outcome: Shortlist of potential locations for each site required by the project, with a selected first choice location for each.

Funding

Identification of potential calls

There are many national and European funding opportunities available for hydrogen projects which can improve the project business case through capital grants or operating cost subsidies. To apply for funding, the project will need to meet specific criteria for the funding scheme. Applications can require substantial effort and be highly competitive, so it is best to apply when the project is well suited to the scope of the funding call and has a high chance of success.

In the development stage, funding calls which are relevant to the scope of the project will be identified.

- Create a shortlist of regional, national, and European level funding opportunities which could be relevant for your project.
- Evaluate each of the funding calls (timing, application effort and competitiveness, funding available, eligibility requirements, etc.) to agree which funding calls the project should apply to and when.
- Identify any actions that must be taken to ensure eligibility ahead of the funding deadline.

The [European Hydrogen Observatory](#) “Policies and Standards” section contains information on regional, national, and EU wide funding opportunities

The platform provides up-to-date information about the European hydrogen sector, including public funding for low-carbon hydrogen projects.

Note: Project scope can be adapted to meet the funding call requirements, but it is recommended to apply to a small number of relevant calls rather than many calls which are not relevant for the project.

Measurable outcome: Shortlist of the funding calls which the project will apply for, and actions to ensure eligibility.

Financing

Business case development

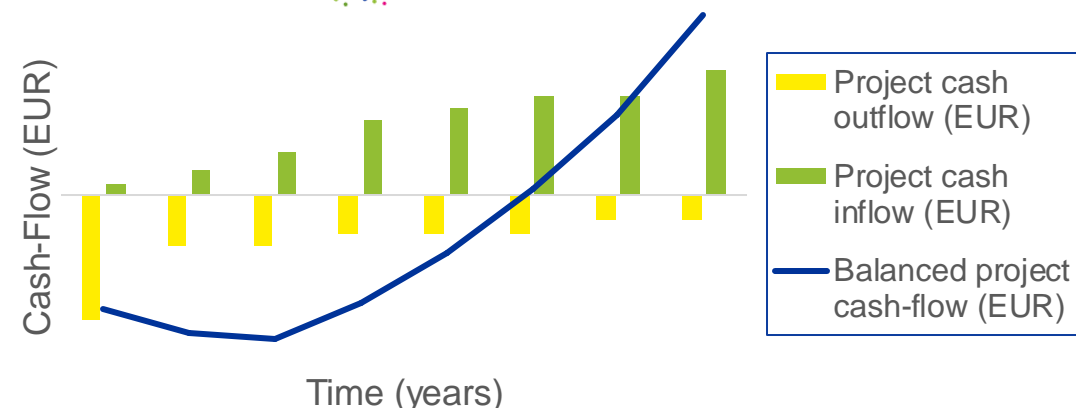
Several toolkits to support project budgeting and scoping in early-stage projects are available from sources such as the Clean Hydrogen Partnership. The project teams should use these toolkits to develop a well validated financial model for the project and to better understand the project’s business case.

Link to Clean Hydrogen Partnership supporting materials including models can be found [HERE](#).

The Clean Hydrogen Partnership has developed a toolkit for the development of a full business case models for hydrogen mobility projects.

Toolkits will guide project teams through the development of a full business model for the project. For projects without a mobility focus, we recommend adapting these toolkits to produce a project-specific business model.

The toolkits have been developed with Roland Berger and include well developed assumptions for market price evolutions from 2021.



Measurable outcome: A full business case model and a cash-flow projection for the project have been produced.

Development Stage

Checklist for documentation

Documentation - Detailed project plan

- The project plan is kept as a 'live document' and is updated to include any changes to the project on an ongoing basis
- The tasks required to deliver the project have identified and grouped into 'work packages'
- A graphical representation of the project team organization is included
- A Gantt chart for the project is included in the detailed project plan including expected lead-times for equipment procurement and permits
- The proposed location of the project site(s) and their requirements are presented
- A financial plan for the project is included
- Funding calls that the project intends to apply for are listed

Documentation

working documents

The detailed project plan will be a multipage document with detailed descriptions of all the components of your project and will explain how the project will be delivered. The project plan will be a live working document, meaning that any changes to the project should be updated in the project plan document. By keeping the project plan up to date, this will ensure that the project team will always have a reference for the most recent changes to the project. The project plan should contain:

- A breakdown of the project into a series of 'work packages' (i.e. groups of tasks needed to deliver the project).
- The proposed location of the project site(s).
- The organisational structure of the project stakeholders with descriptions of roles and responsibilities.
- A Gantt chart for the project which presents the timelines for each work package, procurement lead-times, permitting lead-times, and key milestones within the project delivery timeframe
- List of funding calls the project plans to apply to, expected funding volume, and timelines for application
- A detailed breakdown of the project expenses and a summary of the project business model based on [the Clean Hydrogen Partnership business case model \(see financing slide\)](#).



Project work packages



Site list



Stakeholder structure



Gantt chart



Funding calls



Business case model

Measurable outcome: All the project components listed above are included within a detailed project plan.

Final project stage



Project components required for success

Development stage

Documentation	<i>Documentation is needed to ensure that all stakeholders are aligned on the project plan and to provide continuity in the event of personnel change.</i>	Project implementation plan
Project scoping	<i>Project scoping will determine details of the key elements of the project, including equipment sizing, technology choice and operational strategy.</i>	A detailed project delivery plan
Stakeholders	<i>The project will require engagement with all stakeholders. This activity will develop stakeholder engagement strategies</i>	External stakeholder engagement strategy
Procurement	<i>A procurement strategy for the project is required to enable access to equipment on an appropriate timeline and at an acceptable price.</i>	Send out RFIs to suppliers of key equipment and update supplier database
Permitting	<i>Permits are required to deliver the project. Teams should engage early with local authorities and emergency services to avoid delays.</i>	Begin applications for long lead-time permits
Location	<i>A suitable location or locations will be found and secured for the project.</i>	Reach a procurement agreement for the project site's land
Funding	<i>Funding is available across Europe to enable regional carbon projects. This activity will evaluate funding opportunities.</i>	Develop a detailed project business plan, including a model of the business plan viability.
Financing	<i>Capital investment will be required to deliver the project – A strategy for financing the project will be developed through this activity.</i>	

Final Stage

Checklist for project scoping and stakeholders and procurement

Project Scoping - Develop a project delivery plan

- A delivery plan for the project has been produced
- The project has been broken down into a series of work packages and the purpose of each work package has been included in the project delivery plan
- The project delivery plan has developed a series of tasks to deliver each work package with responsibility assigned to at least one project delivery team member
- The project delivery plan includes milestones and deliverables for each work package

Stakeholders - letters of intent and stakeholder engagement strategy

- Signed letters of intent have been received from key project stakeholders as evidence of engagement in the project.
- An external stakeholder engagement strategy has been developed by the project delivery team

Procurement – RFIs sent to key equipment suppliers

- RFIs from key equipment suppliers have been received and the equipment database has been updated with information provided by suppliers

Project scoping

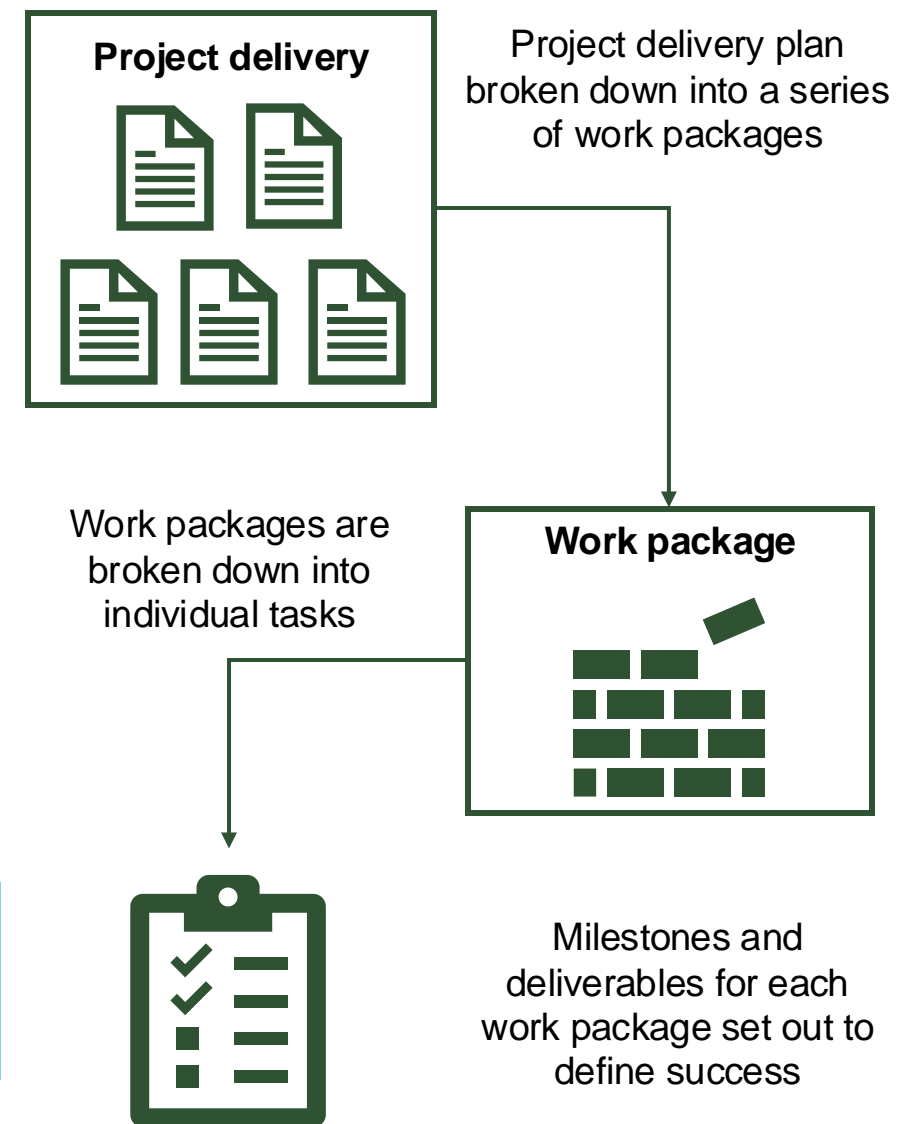
project delivery plan

The final stage of project scoping uses the project work package structure from the [development stage – documentation activity](#) to produce a full project delivery plan. The project delivery plan will:

- Outline the purpose of each work package
- Break down each work package into a series of detailed tasks
- Outline the measurable deliverables and milestones to be reached in each work package.
- Identify the person or people responsible for delivering the work package and individual tasks.

The project delivery plan will be maintained as a 'live' document and any changes to the project will be reflected in the project delivery plan.

Measurable outcome: A detailed project delivery plan for the project is produced which includes a breakdown of all project work into work packages and assigns work packages to specific project members.



Stakeholders

letters of intent and engagement strategy

The goal in the final stage of the glidepath is to secure letters of intent from key stakeholders to prove their willingness to engage with project delivery. This ensures the project can commence with all key project members as soon as it is launched. The main project stakeholders will already have been identified when forming the project delivery team in the [initial stage – Stakeholders activity](#). An example of this might be a commitment from a regional off-taker to purchase renewable hydrogen from the project.

Measurable outcome: Letters of intent from the key project stakeholders signed

To ensure the project is successful and is well accepted among a wider stakeholder group, the project should develop an engagement strategy. An engagement strategy will include events like information days, webinars, social media engagement, promoting ways for the wider stakeholder group to contact the project delivery team, etc. The engagement strategy will aim to:

- Explain the purpose of the project and help wider stakeholders understand its benefits.
- Help to gather wider support for the project
- Allow the project to connect with other project teams or with other initiatives by giving the project a more active presence in the region.

Supporting documents for stakeholder engagement strategy

1. [FuelCellBuses.EU](#) assembled resource on stakeholder engagement
2. Examples stakeholder engagement strategy from [TAP project](#).

Measurable outcome: A stakeholder engagement strategy has been developed by the project team.

Procurement

Requests for information

The project team will reach out to suppliers to gather information to support their procurement strategy. The project team will look to develop a greater understanding of equipment procurement lead times, the cost of equipment, and suppliers of key equipment who will engage with the project. Project teams may develop a shortlist of preferred suppliers which can be approached for a public tendering process when the project is ready to launch.

Suppliers should be contacted using requests for information (RFIs) to establish the following information:

- Equipment specifications (expected lifetime of equipment, required inputs and outputs of the equipment, typical use conditions and tolerance to extreme conditions such as temperature or humidity)
- The price of the equipment
- The lead-time of the equipment (since there is currently a much greater demand for hydrogen production equipment than there is supply, this means that long lead-times for equipment procurement may exist)
- Main contact points in the company for further engagement with the project
- Any minimum order volumes or limitations on delivery locations

Information gathered from RFIs should be used to update the equipment database developed in the [development phase – procurement activity](#).

Measurable outcome: RFI responses from key equipment suppliers have been received and the equipment database has been updated with information provided by suppliers.

Final Stage

Checklist for permitting, location, funding and financing

Permitting - Applying for long lead-time permits

- The timeline for permits has been included in the detailed project plan Gantt chart
- Applications for long lead time permits have been submitted

Siting – Secure site access

- Plans are in place for the procurement or leasing of the project site(s)

Funding and financing- Enhance the project business plan with key information

- The source of all capital for the project and the conditions for providing capital have been identified
- The ownership structure of the project components has been determined
- The cash flows between project partners throughout the duration of the project has been modelled and agreed
- The project business plan has been modelled to determine whether the project is financially feasible (can the project meet the conditions of the capital, will the project be profitable, etc.)

Permitting

Long lead time applications

In the [development stage- permitting activity](#), a list of permits required for the project was assembled and the average lead time for these permits determined. In the final stage, the project team will begin the application process for the longest lead time permits (which would otherwise risk delaying the project). Project teams will engage with permitting bodies and gather the required documents to apply for the permit. Where reasonable to do so (e.g. the cost of the permit is not too big), the project team will submit an application for long lead-time permits to avoid delays in project delivery.

Measurable outcome: Long lead time permit applications prepared and, where appropriate, applications submitted.

Siting

Securing site access

For the final stage, the project teams will secure permission to develop on the site or sites where the project will be located. This might be achieved through ownership or a leasing agreement. You will need to have access to the site to begin the applications for certain permits. For projects where land acquisition will involve high costs (i.e. the land is not already owned by the project team) then the project should develop an agreement with the landowner (e.g. MoU, HoTs) to demonstrate conditional access to the project site.

Measurable outcome: The project team can demonstrate access to the project site(s).

Funding and Financing

Capital, ownership structure, and cash-flow

In the [development stage- financing activity](#), the project team completed a Clean Hydrogen Partnership business model to understand project component costs and cash flow. In this final combined funding and finance task, the project team will develop a more detailed understanding of the project business plan. Crucially, the project team must understand the source of all project capital.

The project team will determine the following:

- The source of capital for the project (i.e. who will invest capital in the project)
- The terms of agreements for all capital provided for the project (what are the conditions which will be agreed to for providing money for the project? This may include equity and debt)
- What is the ownership structure of components of the project (for example, if the project will purchase fuel cell buses, who will own these assets?)
- What will the structure of cash-flow be between project partners (for example, will bus operators lease the use of the fuel cell buses and, if so, how much will the bus operators pay the bus owners?)
- For projects which will apply to grant funding as a source of project capital, the project team should model the impact of this funding on the project business plan.
- The project team must model, using well justified assumptions, whether the project business plan is feasible (is the internal rate of return acceptable).

Measurable outcome: The project team has identified all sources of capital for the project and the ownership structure of the project, including ownership of all key project components is described in the business plan. Project cash-flow between project partners will be modelled. The project team will model the project business plan to determine whether the project business case is feasible.

Final Stage

Checklist for documentation

Documentation – Project implementaion plan

- The project implementation plan details the benefits of the project and provides evidence to validate these claims
- The project implementation plan details the project's stakeholder engagement strategy
- The project implementation plan justifies the choice of core project components, including choice of technology and scale of deployment
- The project implementation plan explains how the project will meet its aims and objectives
- The project implementation plan provides performance-based specifications for all equipment required
- The project implementation plan details the project's capital budget and business plan
- The project implementation plan sets out the planned sources of funding, timelines for funding application, and volume of funding expected
- The project implementation plan sets out the roles and responsibilities of the project delivery team
- The project implementation plan contains a project delivery plan and outlines the work package structure and delivery schedule of the project

Documentation

Project implementation plan


Produce a full project implementation plan which will include studies into the operational, financial, technical, and market feasibility of the project.


- **Market feasibility:** justify the project by demonstrating the need for hydrogen. The market feasibility should present the benefits of the project (in terms of emissions avoidance and economics benefits) and supply evidence to justify this benefit (e.g. letters of intent from local stakeholders, EU policies which mandate elimination of fossil-fuels, etc.). The project should also demonstrate the need for hydrogen from the specific project offtaker and provide details of the [stakeholder engagement strategy](#).
- **Technical feasibility:** present and justify the technologies and sizing of the core project components to meet the objectives. Where possible, the technical feasibility study should reference technical reports on the project and similar projects.
- **Financial feasibility:** present the capital budget and the business case for the project. This will include analysis of the expected funding and financing sources and their impact on the overall business case, as well as the ownership of assets and cashflows between partners.
- **Operational feasibility:** present the stakeholders involved in the project and their responsibilities, as well as a governance structure for project delivery. A project delivery plan should describe the tasks, work packages, milestones, and timelines for delivery, including a Gantt chart.


Measurable outcome: A full feasibility study which includes market, technical, financial and operational feasibilities for the project has been produced.


At the end of the glidepath, the checklist should be complete. You are prepared to launch your project.





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Market feasibility study
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Operational feasibility study
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Technical feasibility study
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Financial feasibility study
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Project delivery plan
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Procurement strategy
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Letters of intent from stakeholders