

An isometric illustration of a hydrogen valley facility. The scene includes wind turbines, solar panels, industrial buildings, a ship, a train, and a residential area. A large stylized 'H' logo is in the top left. A colorful dotted line connects the 'Clean Hydrogen Partnership' text to the 'H2' logo. The background is a deep blue gradient.

Clean Hydrogen
Partnership

Conducting a Socio-economic Impact Assessment

Hydrogen Valley Facility

2025

Roland
Berger

The H2V Facility delivers dedicated support to hydrogen practitioners via PDA services, the H2V Knowledge Centre and the H2V Platform

The Hydrogen Valleys Facility

h2v.eu

Dedicated support via the **Hydrogen Valleys Facility** by



1



Project Development Assistance

Provision of dedicated Project Development Assistance (PDA) for Hydrogen Valleys projects towards Final Investment Decision

2



H2V Knowledge Centre

Sharing & dissemination of knowledge and provision of capacity building for the broader hydrogen community

3

H2V Platform



Maintenance & extension of the Hydrogen Valley Platform to enhance its positioning as the global one-stop-shop for hydrogen flagship projects

Delivery
partners

Roland
Berger



worley

Inycom

Aspirational target

2030

50

Hydrogen Valleys
operational/under
construction

within the EU



This document is part of the H2V Knowledge Centre that offers hydrogen practitioners knowledge material in written and interactive formats

The H2V Knowledge Centre



Structure and scope of the H2V Knowledge Centre

Self-service Knowledge Material

Commercial



Technical



Regulatory



Valley governance



- Knowledge material specifically developed as part of the H2V Facility project
- Links and information to other third-party resources and material

Interactive Formats

- Webinars with content experts (Roland Berger, Worley and external speakers)
- Project Development Assistance experience sessions with Hydrogen Valley practitioners

Target audience



Hydrogen Valleys



Project developers



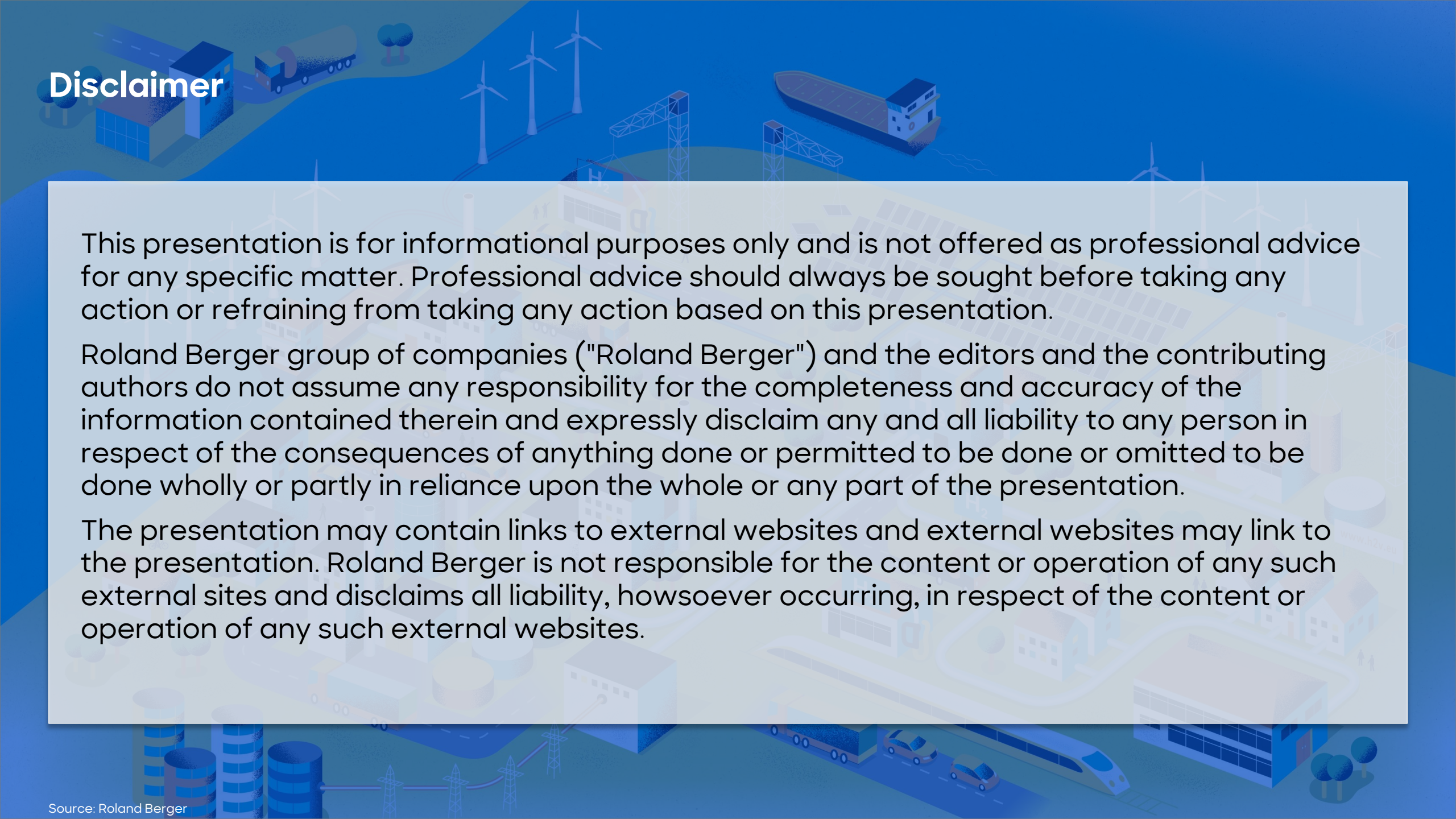
National, regional and local authorities



Investors



Other hydrogen practitioners



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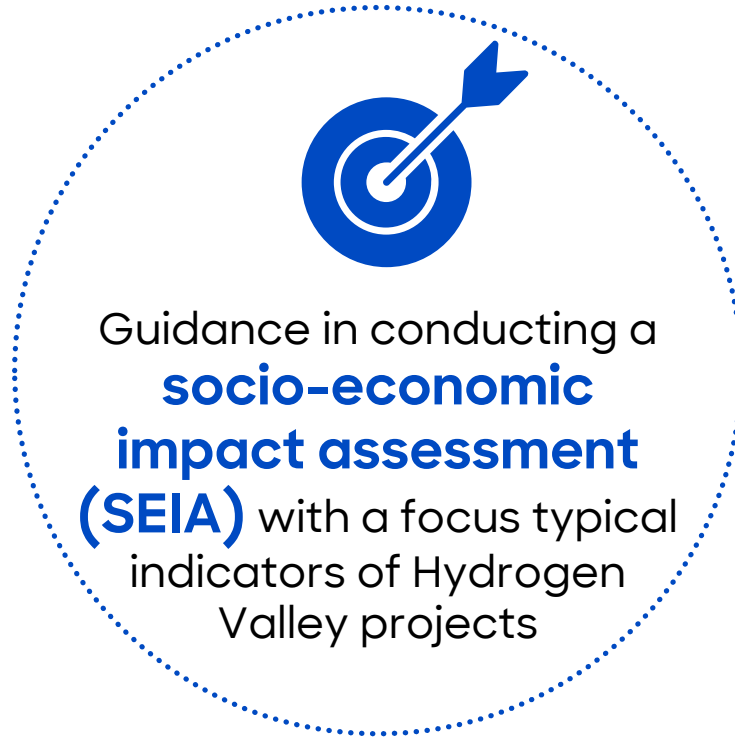
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Key objective of this document is to provide guidance on how to conduct a socio-economic impact assessment of Hydrogen Valley projects

Key objectives and content of this document

Key objectives



Key content

- A Objectives of a socio-economic impact assessment (SEIA)**
Explanation of common objectives, steps in conducting a SEIA and key indicators to be assessed
- B Structure of a SEIA report**
Overview of typical contents in the report
- C Methodology and data collection for a SEIA**
Description of typical collection methods and methodologies to assess quantitative and qualitative socio-economic impacts

Contents

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An isometric illustration of a hydrogen economy. It features a network of blue pipes connecting various facilities. On the left, there are wind turbines and a large white cloud. In the center, there are industrial buildings, some labeled with 'H₂', and a large solar panel array. On the right, there are more wind turbines, a residential area with houses, and a sign that reads 'www.h2v.eu'. A blue train is visible at the bottom. The overall color scheme is blue and white, with some green for the ground.

A. Objectives and framework of a socio-economic impact assessment

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With a socio-economic impact assessment, the intended and unintended positive and negative effects of Hydrogen Valley projects can be analyzed

Definition and key objectives of a socio-economic impact assessment (SEIA)

Definition

A **socio-economic impact assessment** is a structured way of analyzing and evaluating a project's **positive and negative social and economic effects** for the society as a whole and for various parties and groups affected

There is **no standard definition** for a SEIA as a SEIA is highly context-specific regarding its objectives, scope and indicators



Key objectives of a SEIA

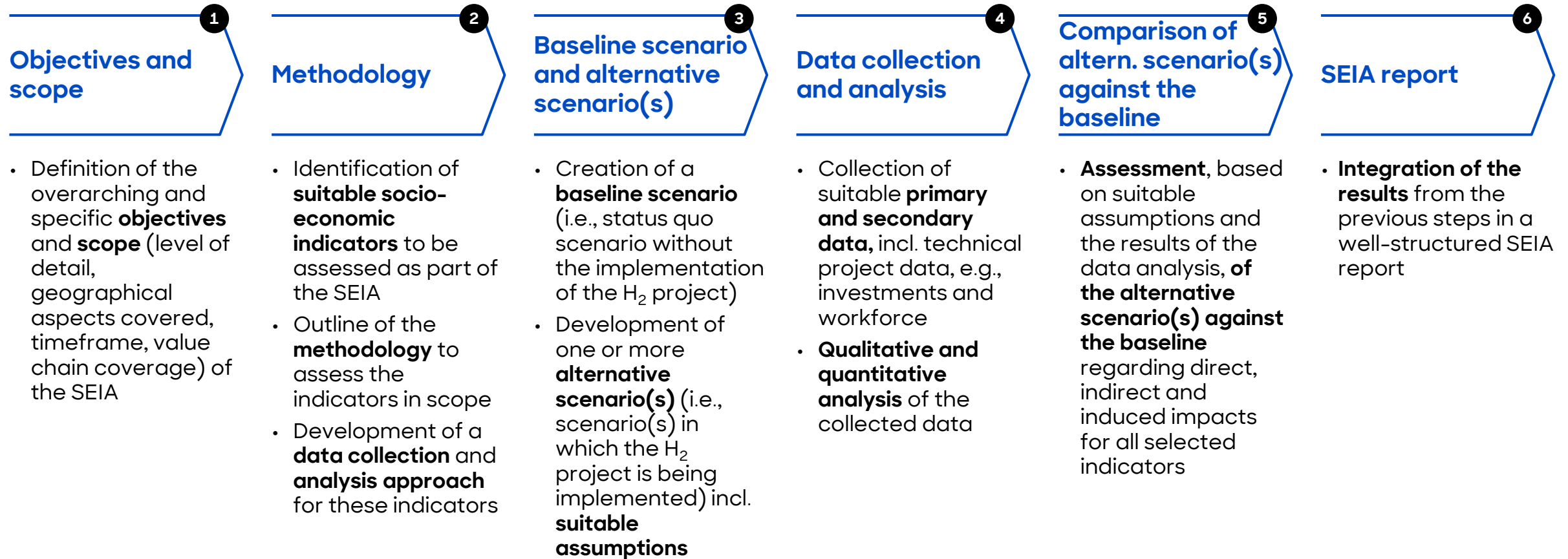
- 1 Identification of **key positive and negative impacts** on local communities and the economy
- 2 **Development of strategies** to enhance positive project outcomes and to mitigate negative project effects
- 3 Enhancement of **local acceptance** of the project by an early and transparent involvement and information of stakeholders

Relevance for Hydrogen Valleys

-  **Receiving regulatory and permitting approvals** can require SEIA as part of the Environmental and Social Impact Assessment (ESIA)
-  **Unlocking funding and investments** as application requirements or due diligence can include SEIA for ESG and economic impact evaluation
-  **Ensuring social license to operate** by addressing stakeholder concerns and demonstrating project benefits

A SEIA comprises six main steps – after defining the objectives and methodology, the impacts of the H₂ project scenario will be compared against the baseline

Approach for conducting a socio-economic impact assessment



The SEIA aims to assess the direct, indirect and induced impacts of a Hydrogen Valley along the entire value chain

Scope and key impact indicators of a socio-economic impact assessment

Hydrogen Valleys include

 Production

 Storage

 Transportation

 End use

Direct impacts

The **immediate effects** of an activity on the **economy** and **society**, including **direct employment**, revenue generation, and business output



+

Indirect impacts

Secondary effects through **supply chains** and **related industries**, including **upstream** (e.g., suppliers) and **downstream** (e.g., distributors, service providers) activities

+

Induced impact

The **broader economic effects** resulting from **increased income** and **spending** by employees & suppliers

Selected key impact indicators

1

Economic Output [EUR p.a.]

Measures the total value of goods and services generated

2

Job creation [# FTE]

Measures the total number of direct and temp. full-time jobs generated

3

Tax contribution [EUR]

Measures the additional tax revenues generated for the state and country

 Focus of a SEIA

Direct impact can be created along the value chain, whereas indirect impact is typically generated up- and downstream and induced impact are income effects

Drivers of direct, indirect and induced impact

Direct impact

... can be generated through:

Production



The production of **green molecules** (H₂) and **green electrons** (PV, wind) directly generate socio-economic impact by **converting raw materials into revenue-generating products**, while also creating **jobs** through plant operation and management

Transportation



Large-scale **hydrogen and ammonia infrastructure** including shipping, terminals, pipelines, and other transport modes generate **revenue through transport activities** and require **skilled and unskilled labour** for the development, expansion, and long-term operation

Storage



Hydrogen and ammonia **storage facilities**, including over- and underground tanks, caverns, and related handling systems, require **skilled and unskilled labour** for construction and long-term operation and generate **revenues through storage and handling operations**

End use



In the end use step, hydrogen valleys enable **industrial production, clean transport services, and new energy applications**, generating economic output and GDP contribution while also creating jobs

Indirect impact

... can be generated through:

UPSTREAM

Supply Chain

The production and supply of inputs needed for green H₂ production including energy, raw materials

Manufacturing & Assembly

Upstream manufacturing of key components needed for green H₂ plants including electrolyzer or chemical plant equipment

DOWNSTREAM

Supply Chain

Transportation and utilization of H₂ in offtake industries such as fertilizer or chemical sector.

Manufacturing & Assembly

Downstream adaptation of industry infrastructure to integrate and use produced NH₃

Induced impact

... can be generated through:

Income effects

Induced socio-economic ripple effects which arise from the income and spending effects generated by direct and indirect job creation in green ammonia projects.

An isometric illustration of a hydrogen economy. It features a network of blue pipes connecting various facilities. On the left, there are wind turbines and a large white cloud. In the center, there are industrial buildings, some labeled with 'H₂', and a large solar panel array. On the right, there are residential houses, a bus, and a train. A ship is visible in the water at the top. The background is a dark blue gradient.

B. Structure of a socio-economic impact assessment report

A logo for the Clean Hydrogen Partnership, featuring a circular arrangement of colorful dots in shades of blue, green, and yellow.

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Partnership**

The structure of a SEIA report typically comprises six chapters with the impact assessment of one or more project scenarios as its core part

Typical structure of a SEIA report

Chapter	Description
Executive summary	Summary with main conclusions from the impact assessment
1. Introduction	Introduction chapter of the SEIA
a. Objective and scope of the SEIA	Description of the objectives and scope of the SEIA
b. Context and background of the project	Description and analysis of the planned projects and the broader economic and social context
2. Methodological framework of the SEIA	Explanation of the methodology used for the data collection, data analysis and assessment of impacts
3. Baseline scenario (status quo scenario)	Description and analysis of the status quo scenario (i.e., in the absence of any action)
4. Impact assessment of the alternative scenario	Core chapter of the SEIA with detailed assessment of all positive and negative impacts the alternative scenario (the Hydrogen Valley project) might cause
a. Direct impacts	Description of all effects that might immediately result from the alternative scenario
b. Indirect impacts	Description of all up- and downstream effects that might result from the alternative scenario
c. Induced impacts	Description of income effects that might result from the alternative scenario
5. Mitigation strategies for unintended or negative impacts	Description of the strategy, approach and measures to reduce and/or mitigate any negative impacts of the alternative scenario that have been identified via the SEIA
6. Conclusion	Summary of the main findings of the SEIA, incl. on the total overall effect of the project
7. Annexes	Details about data used, underlying assumptions, additional information and other relevant insights

> Comments

- Depending on the defined objectives and scope of a SEIA, this **report structure can vary**
- The **core part** of the SEIA report consists of **chapter 4**, where all identified direct, indirect and induced effects are analyzed in detail
- In the **Annexes, further details and information**, including case studies of comparable project and benchmarks, can be added

An isometric illustration of a hydrogen economy. It features a network of blue pipes connecting various industrial and residential buildings. Wind turbines are scattered across the landscape, and solar panels are installed on a rooftop. A large ship is docked at a port, and a train is visible in the foreground. Several buildings are labeled with 'H₂', indicating hydrogen production or storage. A sign in the bottom right corner reads 'www.h2v.eu'.

C. Methodology and data collection for a socio-economic impact assessment

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The SEIA methodology should address direct, indirect and induced impacts both from a qualitative and a quantitative angle

Definition and examples for quantitative and qualitative impacts

The quantitative and qualitative impacts are always assessed against the baseline scenario

1 Quantitative impacts
... are measurable effects of a project on the society and the economy that can be expressed in numerical, statistical, or monetary terms

2 Qualitative impacts
... are non-numerical effects of a project on the society and the economy that cannot be measured in numbers but strongly influence outcomes

	Exemplary indicators	Exemplary indicators
Direct impacts	• Change in the # of jobs • Change in revenue generated • Change in tax contributions	• Changes in the industry acceleration potential • Changes in working conditions • Changes in the quality of skills among workforce
Indirect impacts	• Change in material purchases in affected upstream sectors • Change in upstream production and supply revenues • Change in the # of jobs in affected downstream sectors	• Changes in the intensity of regional supplier networks • Changes in the knowledge transfer in supply chain • Changes in new businesses to enter in local supply chain
Induced impacts	• Change in household spending from wages • Change in # of jobs in service-oriented sectors) • Change in tax revenues from consumer spending	• Changes in the quality of living standard in the area • Changes in the overall community well-being • Change in the economic vibrancy

 **There is no standard methodology for a SEIA as its assumptions, methodology and indicators are highly context-dependent and project-specific**

A SEIA ideally combines qualitative and quantitative data collection and analysis methods – Ideally, mitigation strategies are in place to address challenges

Data collection approach

	 Data collection for quantitative data	+ Data collection for qualitative data 
Primary data sources	Surveys, statistical analysis, economic modelling inputs	Stakeholder / expert interviews, focus groups, workshops, community meetings / hearings, etc.
Secondary data sources	Statistics, labour market data, economic accounts, etc.	Document review, media analysis, case studies
Data analysis techniques	Input-output analysis, social accounting matrices, cost-benefit analysis, risk and sensitivity modelling, etc.	Participatory mapping, data triangulation, content analysis
Common challenges in collection and analysis	• Insufficient data granularity regarding the indicators • Separating project effects from broader trends • Assumptions required for modelling may not hold	• Bias in participation: Higher participation of vocal groups • Subjectivity of testimonials • Stakeholder resistance
Mitigation strategies 	• Ensure quality with triangulation by cross-checking sources • Use multiples from comparable development projects • Perform scenario/sensitivity analysis	• Ensure quality by triangulating, also with quantitative data • Use a well-prepared stakeholder consultation strategy • Apply systematic interview guides, coding, and thematic analysis to reduce bias
 A thorough socio-economic impact assessment is ideally based on a combination of quantitative and qualitative data		

Direct impacts are typically assessed along four key KPIs – Total investment attracted, economic output, employment, and tax contribution

Methodology the calculation of direct impacts

KPIs	Direct impacts	Calculation
	Production Storage Transportation End use	
Investments [EUR m]	Initial CAPEX for establishment of assets	Provided by engineering studies
Economic output [EUR m]	Sales/revenue from plant operations output per year and cumulative over Hydrogen Valley lifetime	H ₂ volume p.a. * expected sales price (EUR) * operational years
Job creation [#]	Job creation from construction (temporary) and operations (permanent)	Permanent: x jobs * operational years Temporary: x jobs * construction years
Tax contrib. [EUR m]	Taxes paid by the Hydrogen valley project per year and cumulative over the project lifetime	(Income before taxes * tax rate) * lifetime years

1) Incl. related infrastructure

The direct impact of the Hydrogen Valley on jobs can be estimated based on a detailed analysis of employment created and local working conditions

Example of direct impacts: Differentiated job creation along project lifecycle

Direct impacts

Job groups	Production	Storage	Transportation	End use
	Operations: Long-term FTE			
Standard worker	xx	xx	xx	xx
Specialized worker	xx	xx	xx	xx
Technicians	xx	xx	xx	xx
Engineer	xx	xx	xx	xx
Director	xx	xx	xx	xx
Support functions	xx	xx	xx	xx
Total	xx FTE	xx FTE	xx FTE	xx FTE

EPC: Temporary FTE

Standard worker	xx
Specialized worker	xx
Technicians	xx
Total	xx FTE

> Overall assumptions

Plant operations FTE salary & distribution:

Average salary	EUR p.a.	share ¹⁾
Standard worker	xx	xx%
Specialized worker	xx	xx%
Technician	xx	xx%
Engineer	xx	xx%
Director	xx	xx%
Support functions	xx	xx%
Average	xx	

• Workforce profile distribution according to provided technical studies

• Checked against other project benchmarks

Construction FTE salary & distribution:

Average salary	EUR p.a.	share
Standard worker	xx	xx%
Specialized worker	xx	xx%
Engineer	xx	xx%
Average	xx	

■ Highest potential for job localization
 1) Experienced-based workforce profile distribution
 Source: Roland Berger

The quantitative perspective is being complemented by a qualitative impact assessment to provide context and reflect also non-numerical impacts

Rationale, examples and methods for qualitative impact assessment

Rationale for qualitative assessment



The qualitative assessment of socio-economic impacts **complements the quantitative assessment** to cover also non-quantifiable effects of the project, in particular

- Quality, strength and type of quantitative effects
- Context information and description of causal relations of effects
- Assessment of social and cultural dimensions

Exemplary qualitative impacts

Employment impacts

- Quality of work
- Working conditions
- Skill level among workforce
- Labour market mobility

Supply chain impacts

- Regional supplier networks effects
- Change in business establishments
- Knowledge transfer along supply chain

Institutional and governance impacts

- Contribution to regional/national decarbonization goals
- Effect on public-private partnerships

Methods for qualitative assessment

Data triangulation

Combination and cross-checking of information from different sources to enhance quality

Thematic analysis

Identification of thematic patterns in qualitative data such as interview transcripts

Grounded theory

Development of theories based on patterns observed

Matrix scoring

Organization of qualitative information in a matrix and score different themes to evaluate them

Significance scale

Evaluation of the importance of different impacts that have been identified

Besides desk research, stakeholder involvement is a main source to assess qualitative impacts as part of a SEIA

Approach for stakeholder involvement

Objectives and key elements of consultation strategy

- Definition of the **scope and objectives** of the consultation activities
- Definition of the **target stakeholder groups**
- Definition of **consultation activities** and a **stakeholder consultation plan**

Stakeholder identification and mapping

- **Identification** of relevant stakeholders
- **Mapping** of stakeholders **into groups** (e.g., from general public, businesses, social partners, research, local and national authorities)

Stakeholder consultation and involvement

- **Contacting** of stakeholders
- **Consultation and involvement** of stakeholders with tailored formats

Typical objectives of stakeholder involvement



- Gathering primary data
- Involvement of local people
- Expert knowledge integration
- Transparency and legitimacy
- Conflict prevention

Typical questions for stakeholder identification



1. Who is **directly** impacted?
2. Who is **indirectly** impacted?
3. Who is **potentially** impacted?
4. Whose **help** is needed?
5. Who **knows** the project?
6. Who will show an **interest**?

Typical consultation formats



- **Exploratory consultations:** interviews with local stakeholders or experts
- **Public consultations:** use of formats such as community meetings or hearings to gather input from a broad range of stakeholders
- **Targeted consultations:** involvement of specific stakeholders via interviews, focus groups, workshops, surveys

