

# How to assess sustainability of ocean multi-use?

**THEME: UNITED Assessment Framework**

# Presentations and speakers

- The UNITED Assessment Framework – Annaïk Van Gerven (RBINS)
- Economic Impact Assessment – Manuel Lago (Ecologic Institute)
- Social Impact Assessment – Manon Berge (ACTeon)
- Environmental Impact Assessment – Gerjan Piet (WUR)

# How to assess sustainability of ocean multi-use?

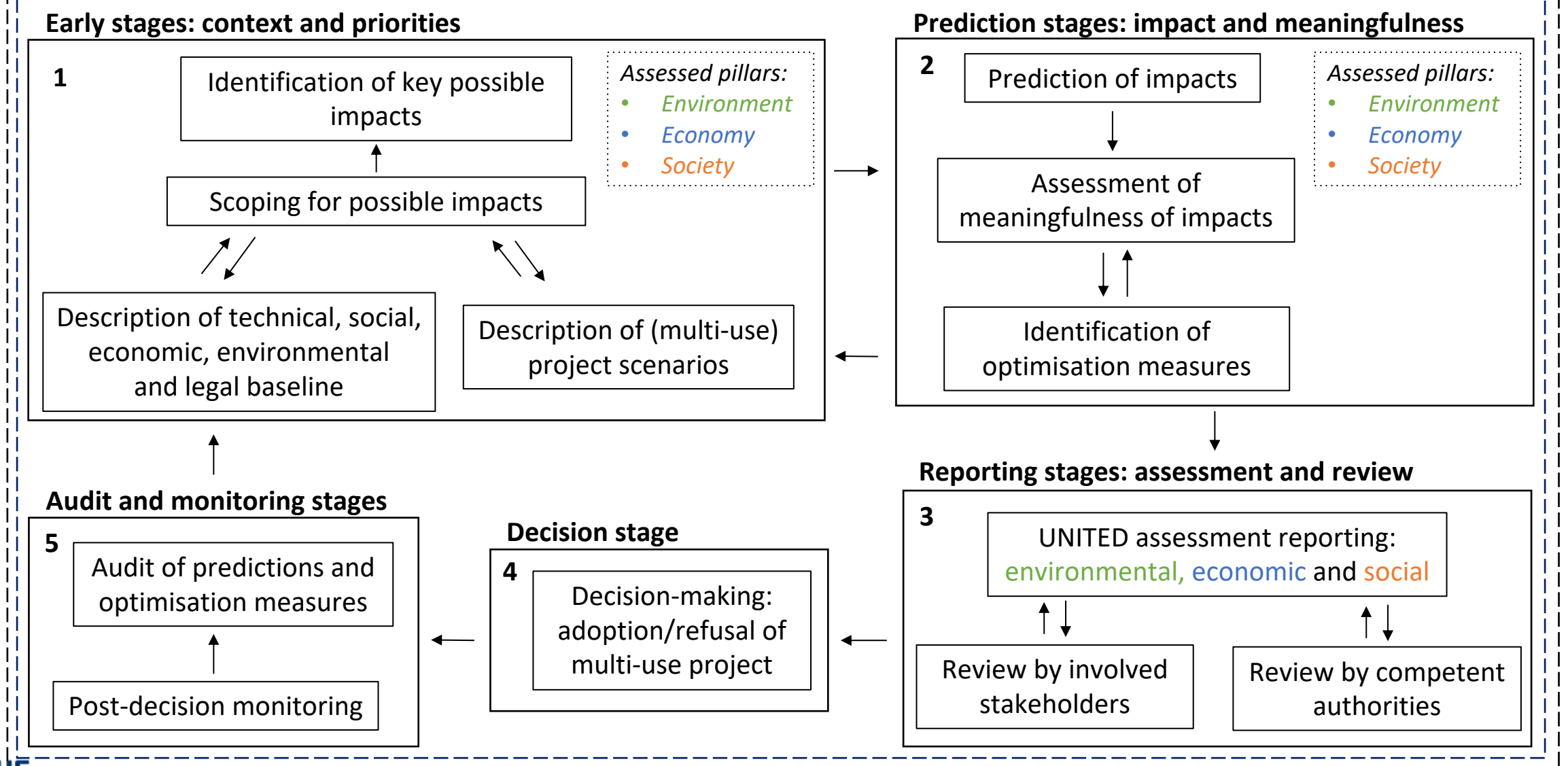
The UNITED Assessment Framework

**THEME: UNITED Assessment Framework**

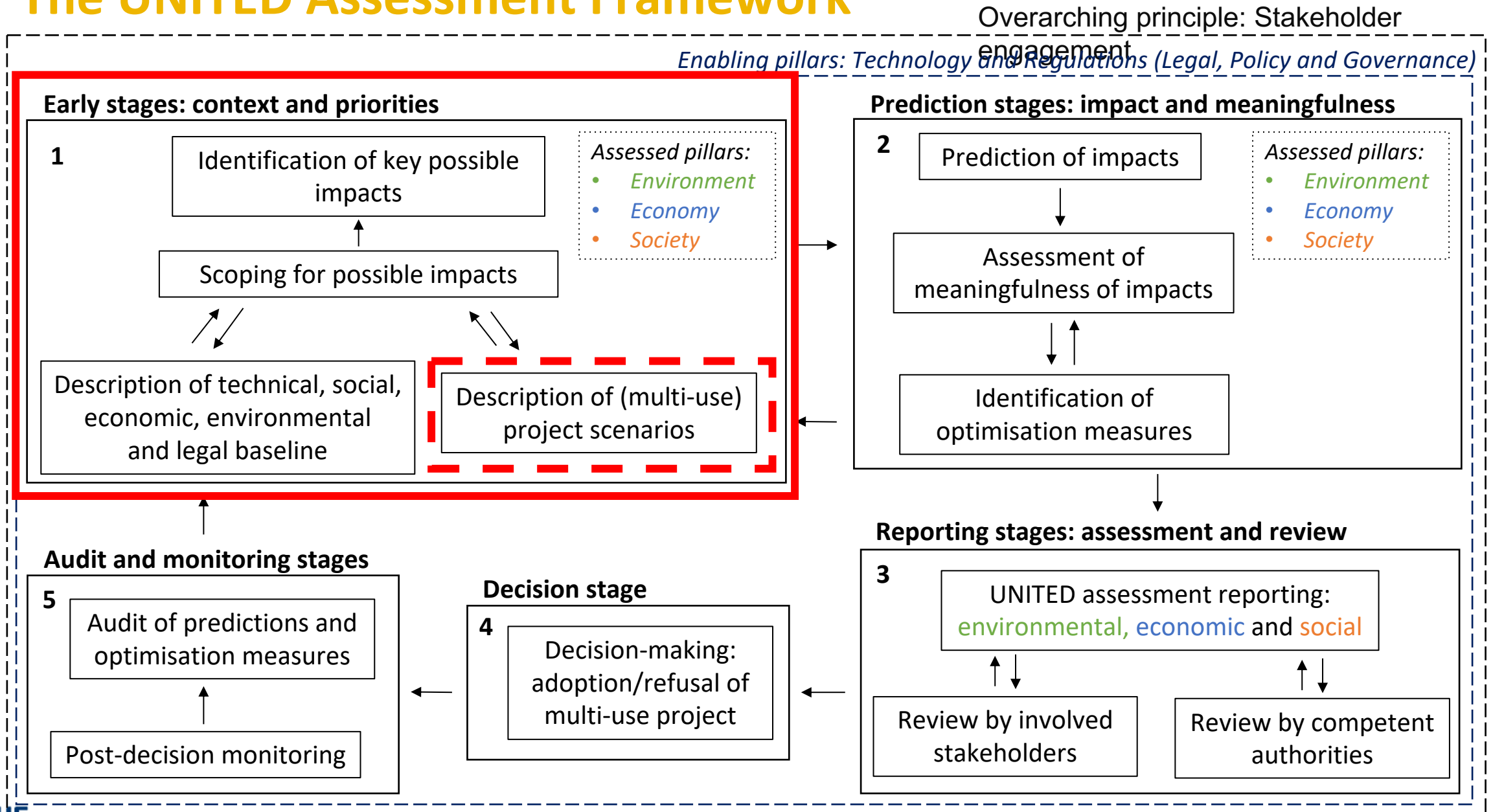
# The UNITED Assessment Framework

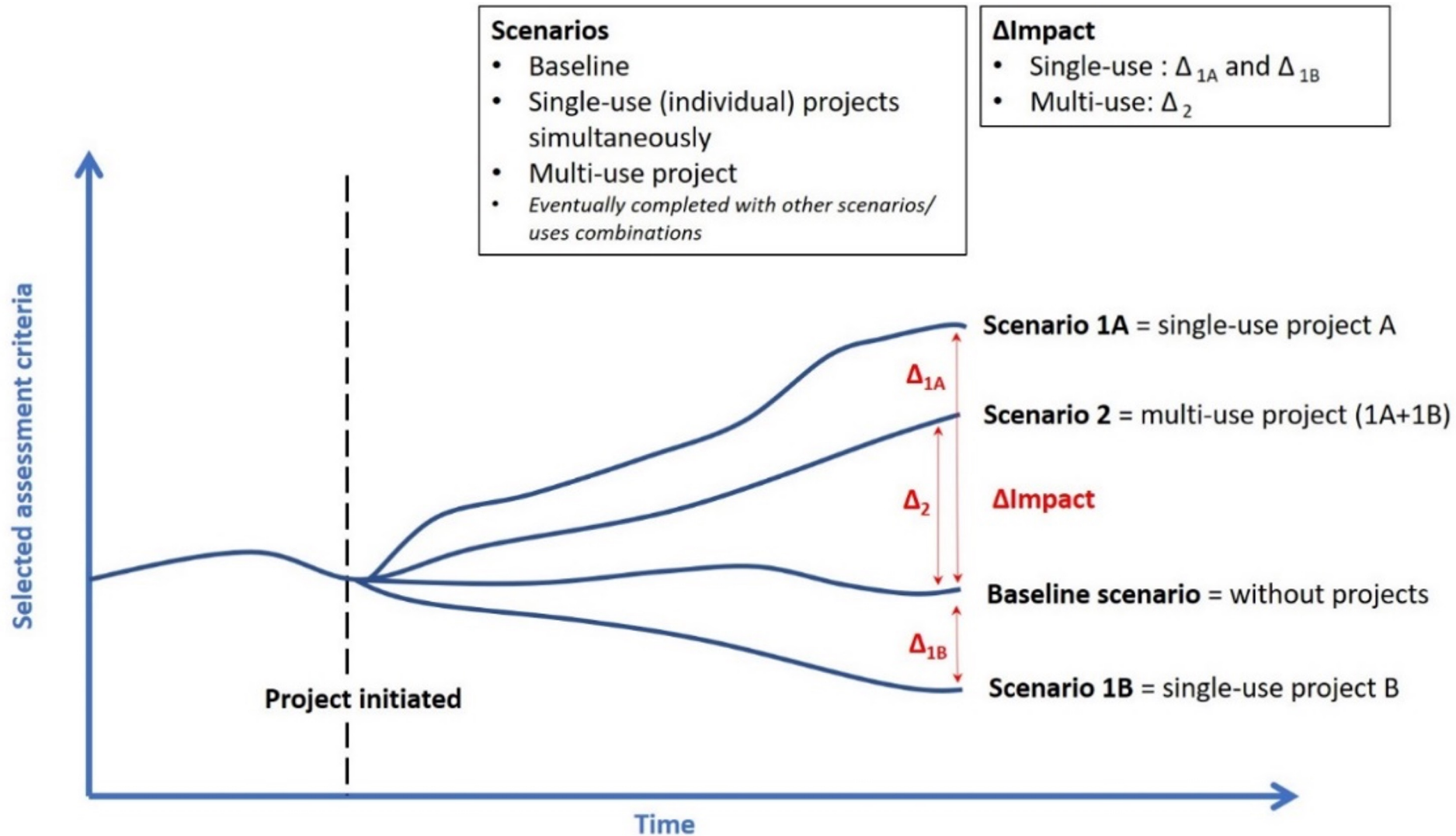
Overarching principle: Stakeholder engagement

Enabling pillars: Technology and Regulations (Legal, Policy and Governance)



# The UNITED Assessment Framework

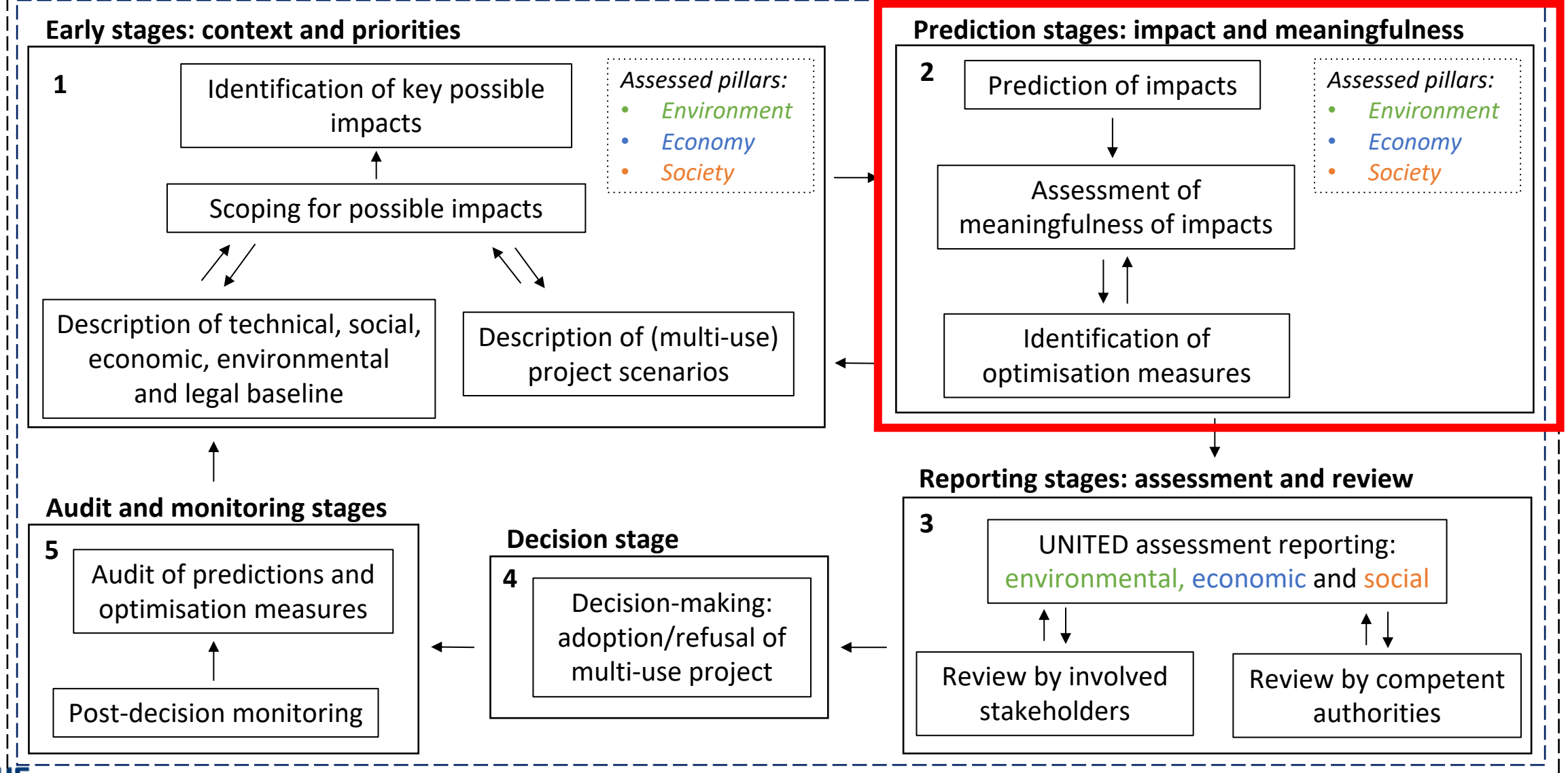




# The UNITED Assessment Framework

Overarching principle: Stakeholder engagement

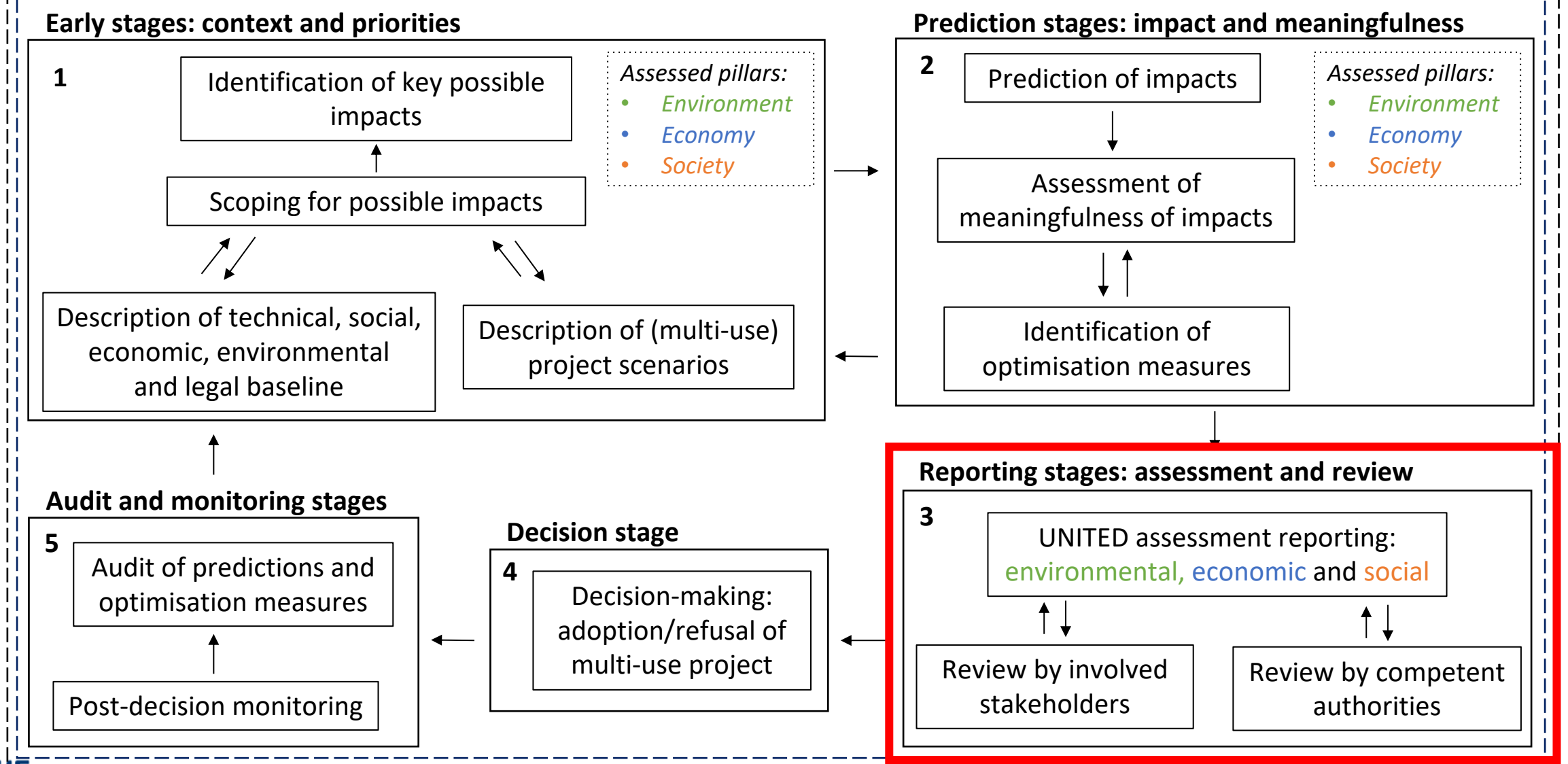
Enabling pillars: Technology and Regulations (Legal, Policy and Governance)



# The UNITED Assessment Framework

Overarching principle: Stakeholder engagement

Enabling pillars: Technology and Regulations (Legal, Policy and Governance)

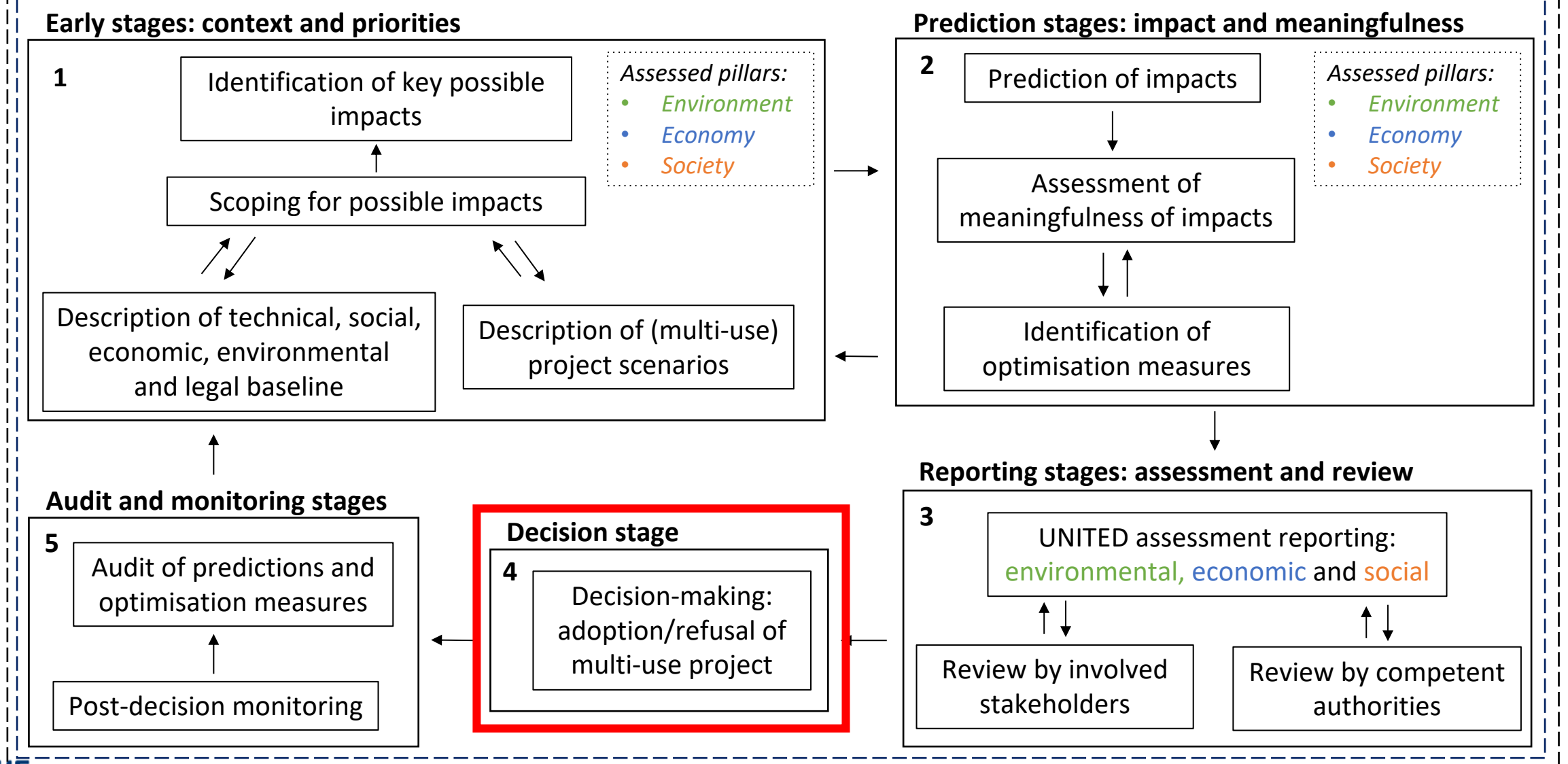




# The UNITED Assessment Framework

Overarching principle: Stakeholder engagement

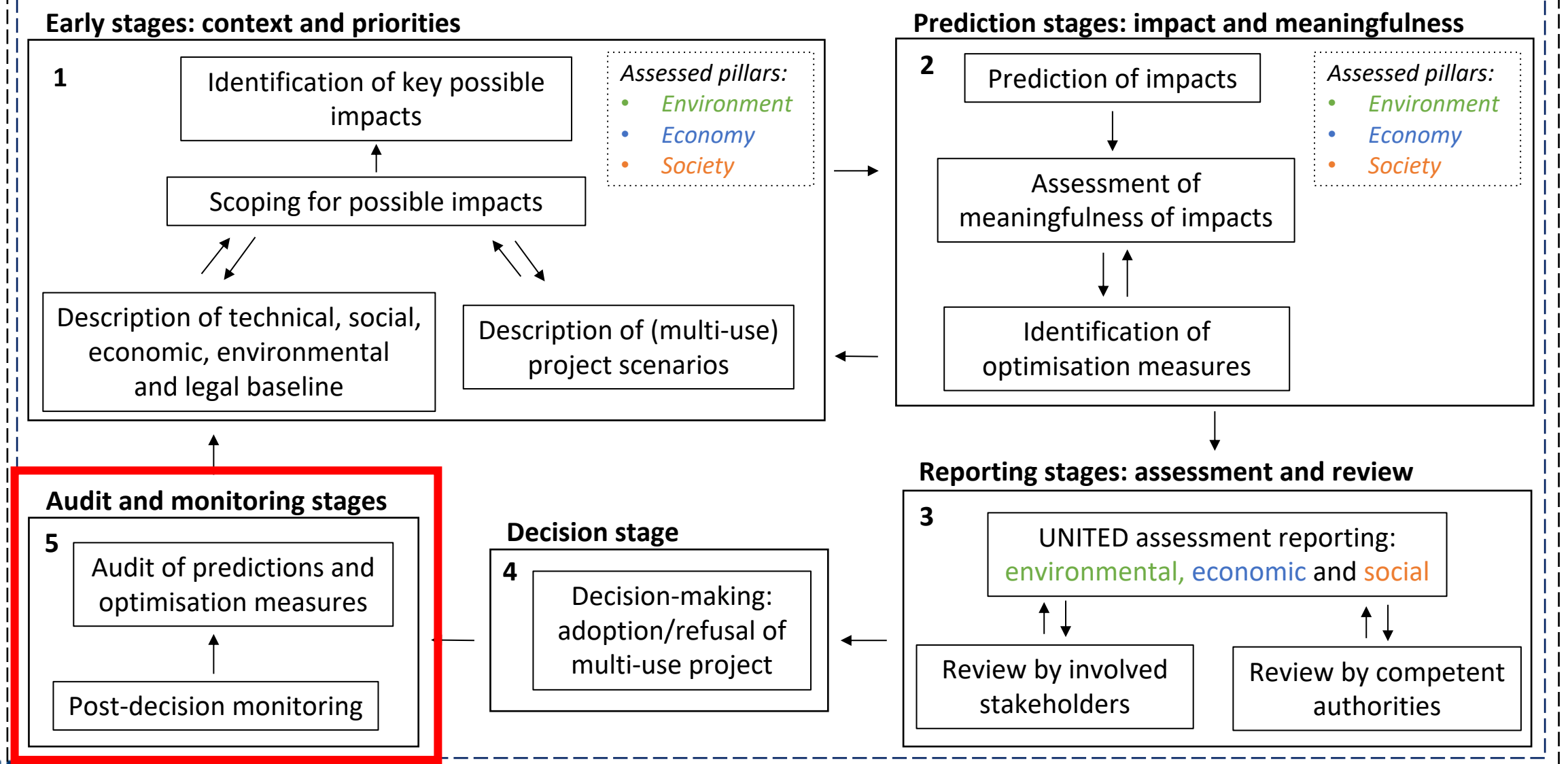
Enabling pillars: Technology and Regulations (Legal, Policy and Governance)



# The UNITED Assessment Framework

Overarching principle: Stakeholder engagement

Enabling pillars: Technology and Regulations (Legal, Policy and Governance)

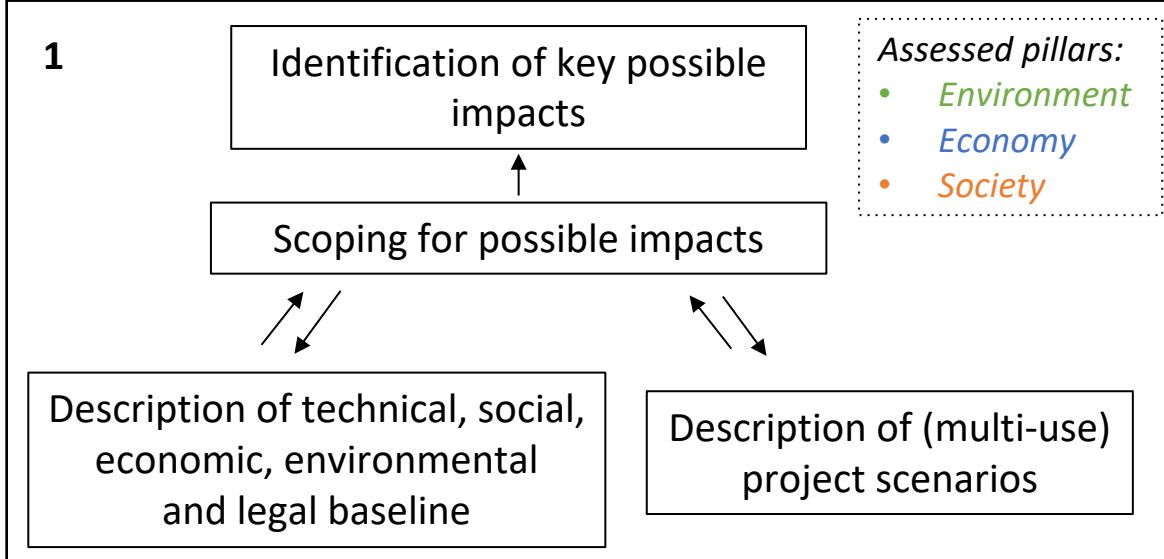


# The UNITED Assessment Framework

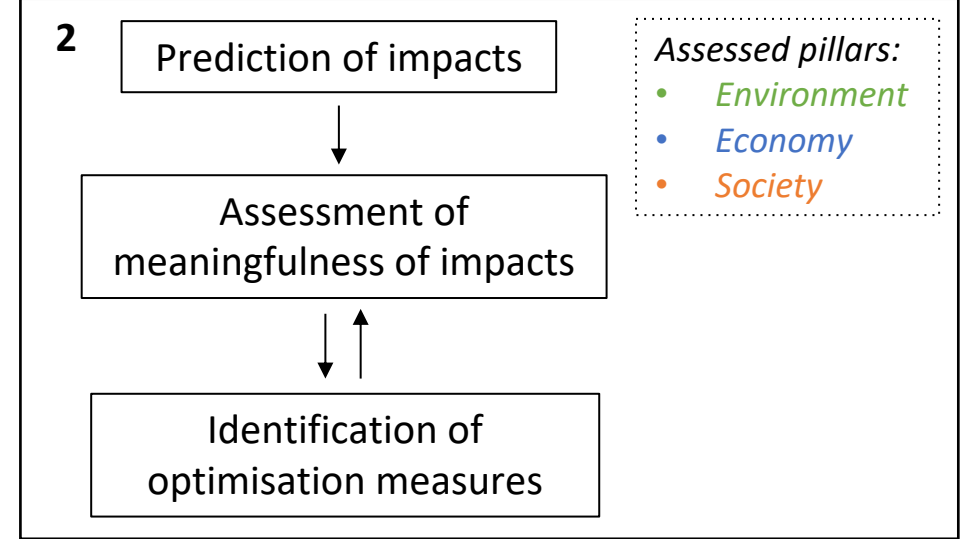
Overarching principle: Stakeholder engagement

Enabling pillars: Technology and Regulations (Legal, Policy and Governance)

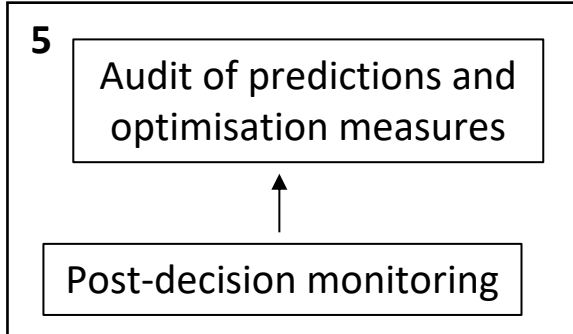
## Early stages: context and priorities



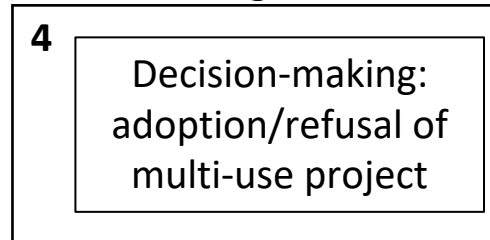
## Prediction stages: impact and meaningfulness



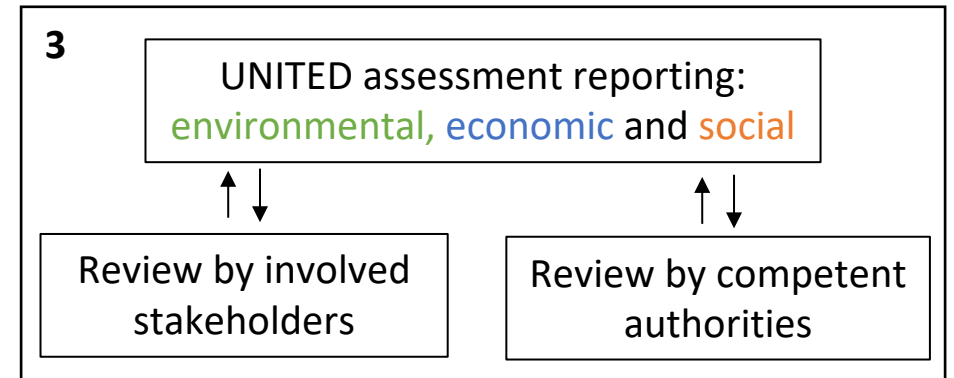
## Audit and monitoring stages



## Decision stage



## Reporting stages: assessment and review



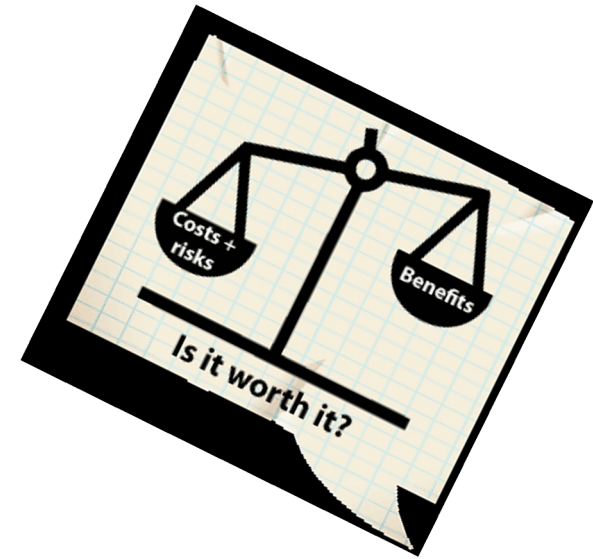
# How to assess sustainability of ocean multi-use?

Economic impact assessment

**THEME: UNITED Assessment Framework**

# Objectives of the economic work in the UNITED project

- ❓ Define an appropriate multi-methods approach to assess costs and benefits at the implementation level and pilot level, taking into account the impacts of MU on ecosystem functions and services and socio-economics.



- ❓ Develop generic business models for the commercial rollout of Multi-Use to promote their uptake, upscaling and lessons learned from practice.

# Developing an impact assessment framework to determine economic feasibility of MU

Key is the distinction between **Public** and **Private Sector decision-making practices**. If we focus on multiuse objectives and their promotion, UNITED explored the answer to the following research questions.

- 1) Is multiuse more socially desirable than single use?
- 2) Does multiuse, rather than single use, make business sense?

**Novelty:** our framework has two distinct, yet compatible, blocks:

- Economic Assessment Framework
- Business Assessment Framework

# MU: relevant uses of marine space in Europe

	Compatible	Generally incompatible
Transitory	<ul style="list-style-type: none"> <li>Maritime tourism (boat tours, scuba diving, visiting underwater cultural heritage)</li> </ul>	<ul style="list-style-type: none"> <li>Mineral exploration</li> </ul>
	<ul style="list-style-type: none"> <li>Oil &amp; gas exploration</li> </ul>	<ul style="list-style-type: none"> <li>Commercial fisheries (demersible otter trawls, midwater trawls)</li> <li>Sand &amp; clay extraction</li> </ul>
Permanent	<ul style="list-style-type: none"> <li>Aquaculture (fish, shellfish and seaweed)</li> </ul>	<ul style="list-style-type: none"> <li>Off-shore wind energy (fixed/floating)</li> </ul>
	<ul style="list-style-type: none"> <li>MPA (Active management sites with economic activity)</li> </ul>	<ul style="list-style-type: none"> <li>Shipping (short sea shipping)</li> <li>Submarine cables (telecommunications and electricity)</li> </ul>
	<ul style="list-style-type: none"> <li>Other Renewables (floating solar, tidal, wave)</li> </ul>	<ul style="list-style-type: none"> <li>MPA (No-take/no-go areas, Active management with small-scale economic activity)</li> <li>Maritime defence (military training areas and other uses)</li> </ul>

Activities potentially suitable for multi-use  
**Activities unsuitable for multi-use**

# Financial vs. Economic evaluations

Evaluation type	Financial	Economic
Decision maker	Project developer	Public authority
Evaluation question	Which option will maximise the expected returns on investment?	Which option will deliver the highest net benefit to society?
Costs and benefits concerned	Private	Social (including private costs and benefits)
Examples of costs and benefits covered	<ul style="list-style-type: none"> <li>- Benefits include the expected revenue over the lifetime of each option</li> <li>- Upfront costs (e.g. capital expenditure to cover construction) and the costs of financing this capital expenditure</li> <li>- Lifetime operating costs of each option (e.g. maintenance costs and costs for decommissioning at end-of-life)</li> <li>- Taxes and subsidies</li> <li>- Does not include externalities (e.g. climate impact) unless these can be profited from (e.g. through carbon credits)</li> </ul>	<ul style="list-style-type: none"> <li>- Net financial profit from differing options (i.e. result of financial evaluation)</li> <li>- Externalities (including relative environmental impacts)</li> <li>- Administration, enforcement and other transaction costs</li> <li>- Broader social impacts (e.g. jobs, etc.)</li> </ul>
Example of costs and benefits excluded	<ul style="list-style-type: none"> <li>- Externalities (i.e. costs and benefits that are not borne by the developer, e.g. environmental impacts, broader social impacts)</li> </ul>	<ul style="list-style-type: none"> <li>- Taxes and subsidies that are just transfers from government to recipients (as these have a net-zero effect)</li> </ul>
Metric	Money	Money, quantitative, qualitative



# The UNITED business analysis framework

- Six steps approach and step by step guidance
- Information collected:
  - Past deliverables
  - Interviews with project partners
- Challenges in carrying out financial feasibility analysis; reasons:
  - Research nature of the pilots (data not readily available);
  - Some sectors (e.g. algae, mussels) still new and no readily available information;
  - Confidentiality of information.

STEP 1: What are the combined activities and their current/target TRL levels?

STEP 2: What are external factors influencing the pilot?

STEP 3: How does the MUCL platform create, deliver and capture value?

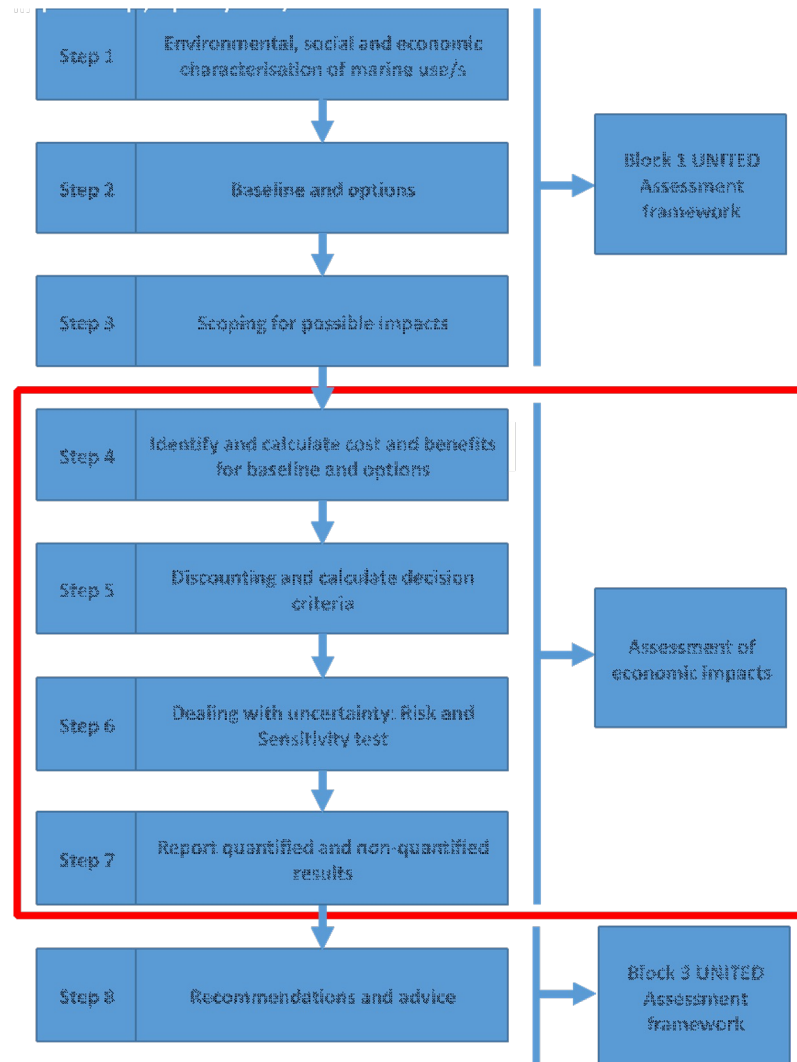
STEP 4: What are internal factors influencing the pilot?

STEP 5: Is the MUCL platform financially feasible?

STEP 6: Evaluation and control?



# The UNITED economic Framework



- Partial cost benefit analysis
- Revised version applied
- Step by step guidance.
- Difficult to quantify impacts for several reasons
- Pilot partners input for the financial analysis
- Stakeholder input for the identification of significant impacts in the project

# Bringing it all together....

- From Benefits to Business: Strategizing Commercialization of Ocean Multi-Use with UNITED
- 11.05 –11.25 Socio-economic benefits and business plans
  - Manuel Lago, Ecologic Institut gemeinnützige GmbH;
  - Youssef Zaiter, Acteon Environment
- **COME! We will share some results!**

# How to assess sustainability of ocean multi-use?

Social impact assessment – Manon Berge, ACTeon  
Environment

**THEME: UNITED Assessment Framework**

# What are social impacts?

Social impacts are **changes** to one or more of the following:

- environment
- health and wellbeing

- personal and property rights

- people's way of life
- culture
- fears and aspirations

- community – its cohesion, stability, character, services and facilities;
- political systems – ability to participate in decisions that affect their lives

Positive impacts (benefits)

Negative impacts (risks)

# Why and how to assess the social impacts of a multiuse project?

*Multiuse → wide range of stakeholders*

→ necessity of **building a common ground**

→ social impact assessment creates an opportunity to discuss « key questions »

→ a bigger added-value to the SIA if it is **participative**

2 goals of the assessment:  
the **actual results + the process**

Awareness  
raising  
among the  
participants

Strategic  
discussion  
throughout  
the process

Building trust  
and mutual  
understanding

# A quick look at the results in UNITED

*From the pilot to the upscaled scenario(s)*

## ***Modification of the local economic fabric***

Job creation directly or indirectly

Alternative to other economic activities (or limitation),  
new markets

Potential improvement of the energy and/or food  
security

## ***Working conditions:***

New hazards, risks

Need for training, reskilling, upskilling

New opportunities/potential exclusion

## ***Awareness raising about ocean and sustainability***

A role in ocean literacy

Increased transparency

Creating more sustainable habits

## ***Development of a sustainable tourism***

Could help mitigate the negative effects of a  
single use site

# How to assess sustainability of ocean multi-use?

Environmental Impact Assessment

**THEME: UNITED Assessment Framework**

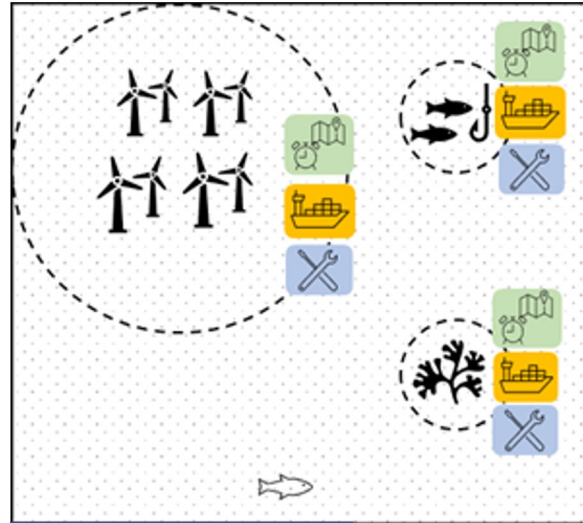


# Environmental Impact Risk Assessment

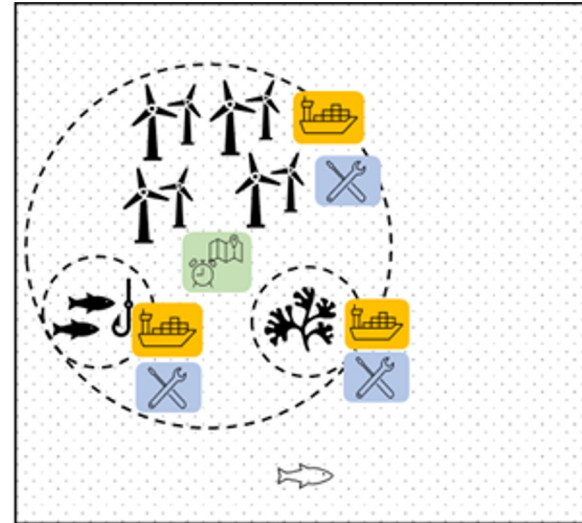
- Based on the North Sea SCAIRM (Spatial Cumulative Assessment of Impact Risk for Management) methodology
- Specific for assessment of Multi-Use platforms and/or Co-Location at platforms (MUCL)
  - 5 pilots (i.e. Belgian, Danish, Dutch, German, Greek)
- Specified (hypothetical) area in a larger marine ecosystem
  - Fish
  - Birds
  - Mammals
  - Seabed habitats (benthos)
  - Water column habitats (plankton)
- Occurs in the context of other activities represented by the Baseline
- Assessment of Multi-Use project compared to Single-Use involving sectoral activities and actions:
  - Offshore wind
  - Aquaculture (mussels, oysters and/or seaweed)
  - Nature restoration (oyster reef)
  - Tourism
- Examples of further use of the methodology

# Configurations of Single-Use and Multi-Use

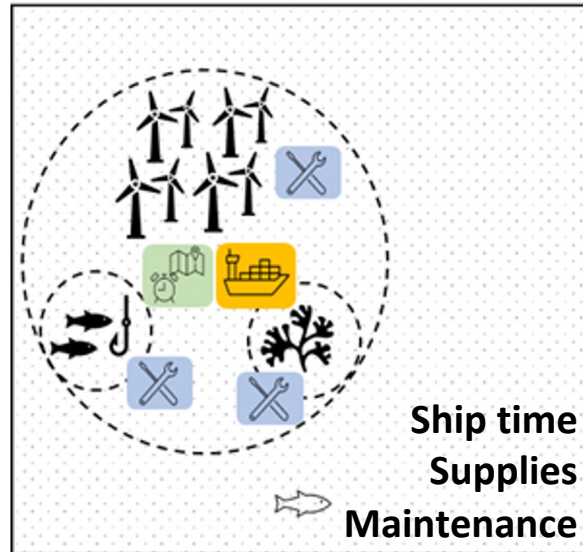
- Goal:**  
Reduction of **Footprint**
- **Spatial**
  - **Environmental**



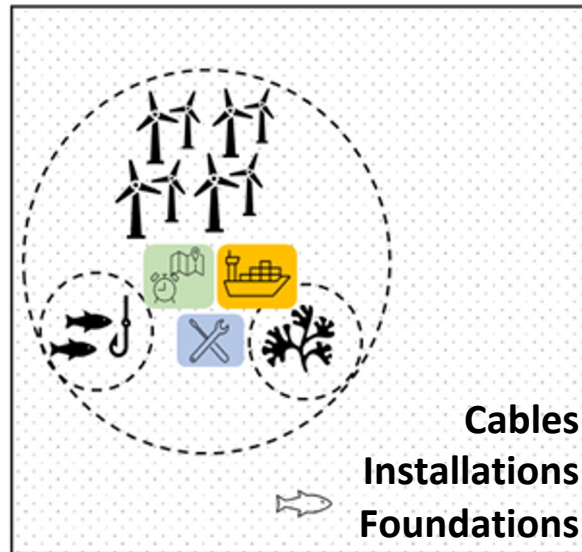
Single-Use



B. Co-existence/Co-location



Multi-Use



Optimal

## Legend

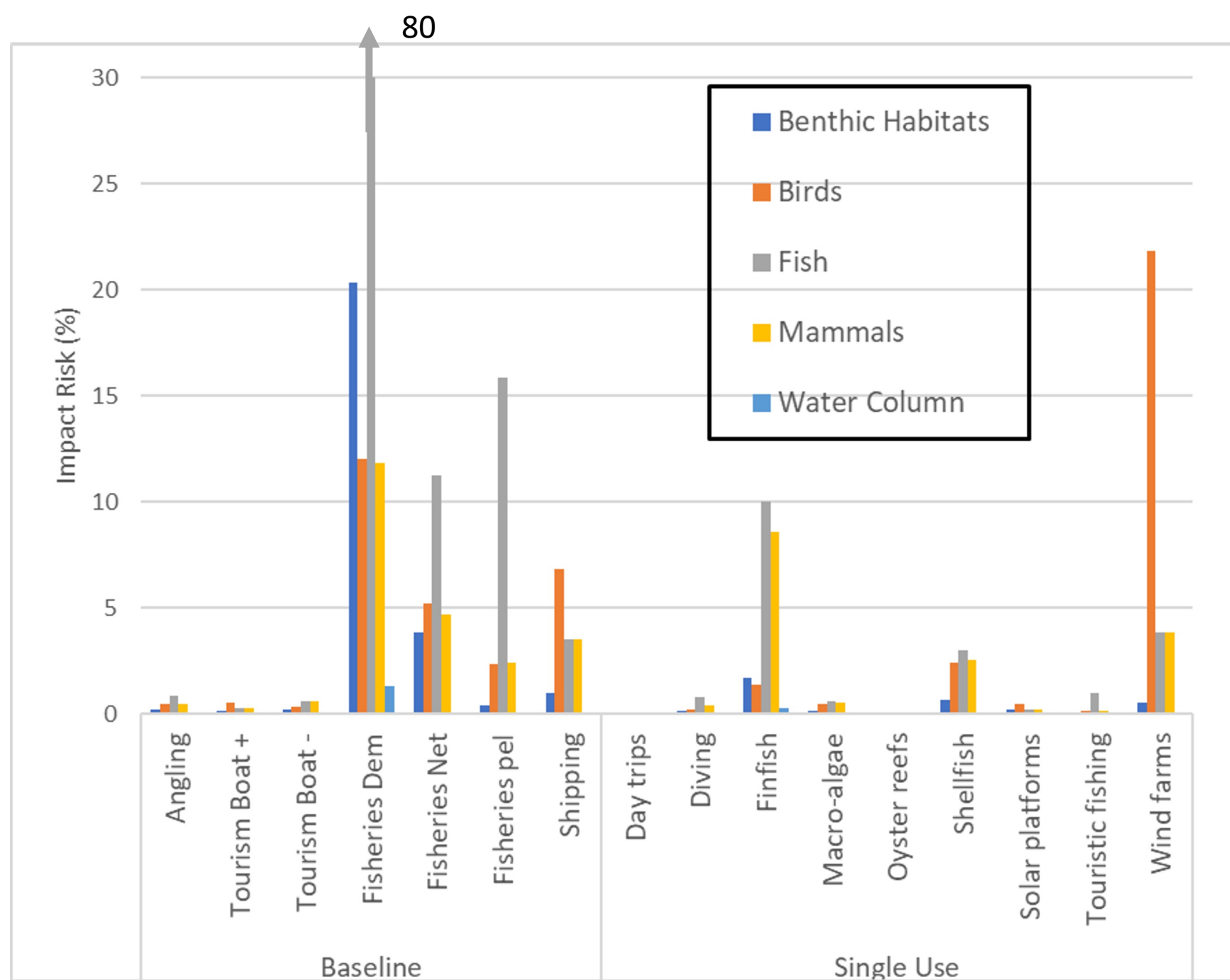
- Distribution Ecosystem Component
- Space & Time
- Provisioning services
- Infrastructure / main functions
- Sector activity Offshore Wind Farm
- Sector activity Tourism
- Sector activity Aquaculture

# Single-use project compared to Baseline

Two perspectives:

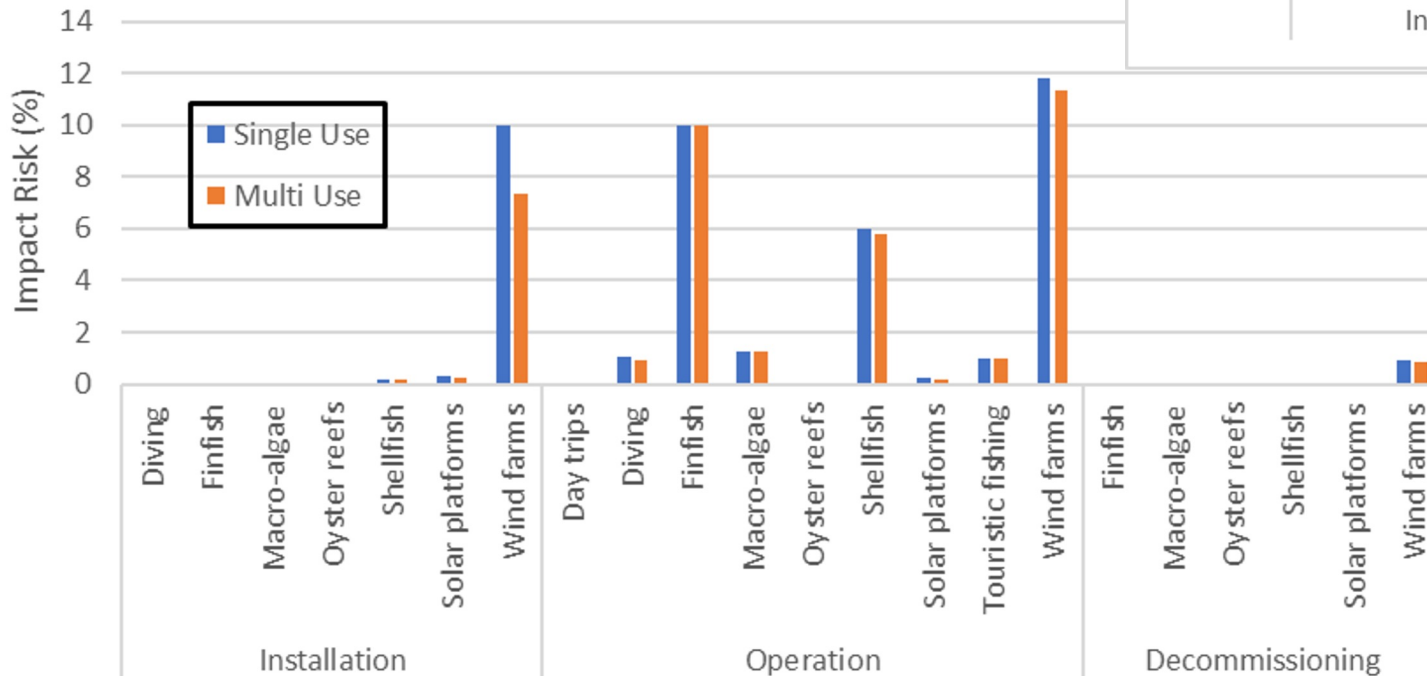
- A. On top: The total Impact Risk increases to 135% of the Baseline and SU contributes **26%** of total
- B. Replace: The Impact Risk caused by the SU project is **35%** of the Baseline

	A	B
Benthic Habitats	11	13
Birds	49	97
Fish	15	17
Mammals	41	69
Water Column	30	43
<b>Total</b>	<b>26</b>	<b>35</b>

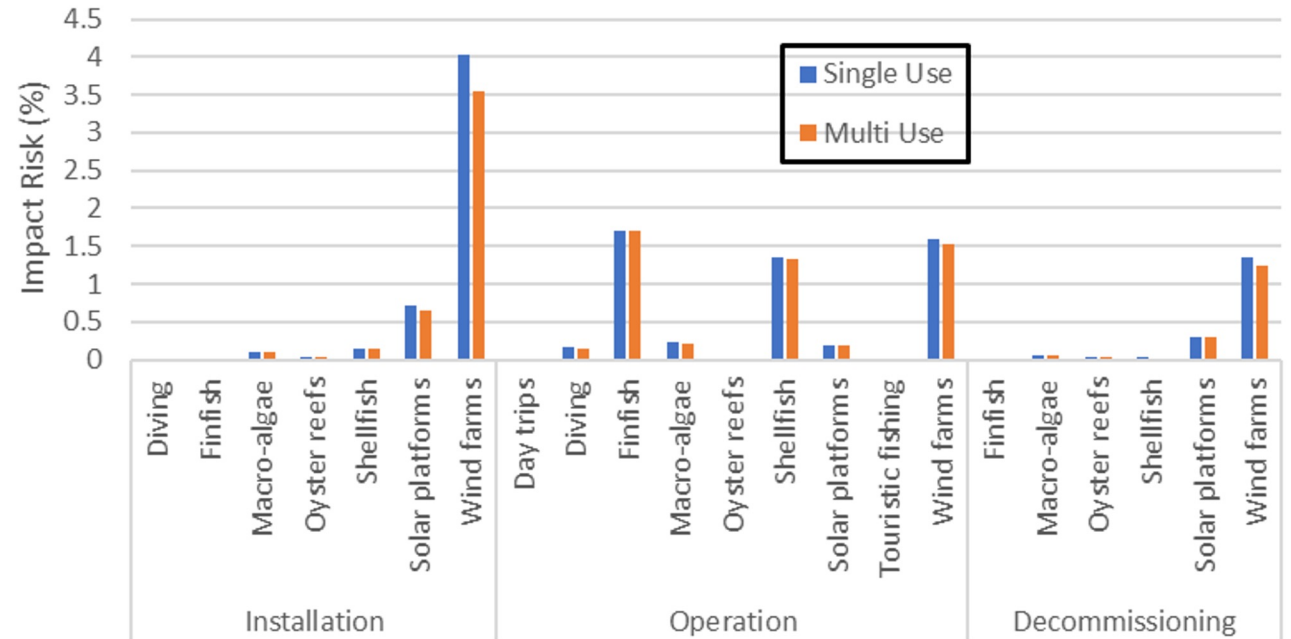


# Multi-Use compared to Single-Use

Fish & Cephalopods



Sublittoral sediment

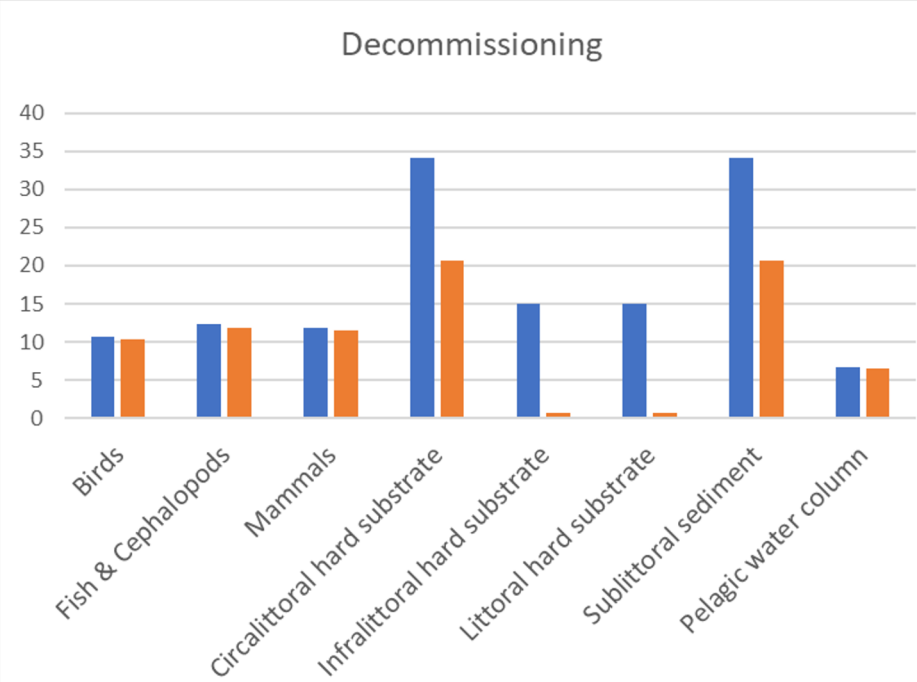
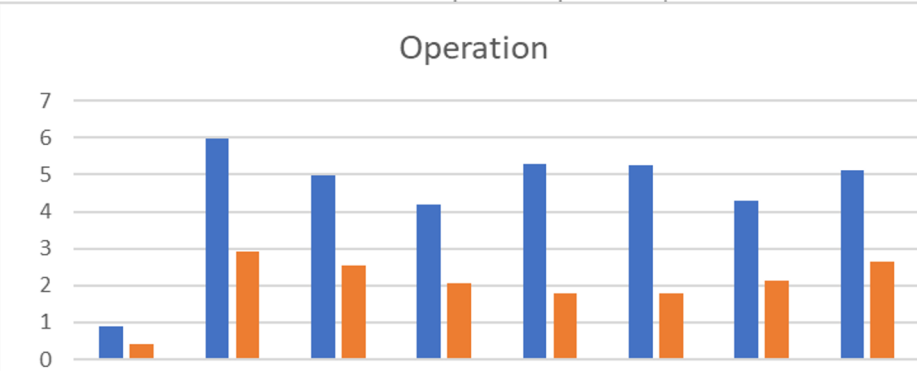
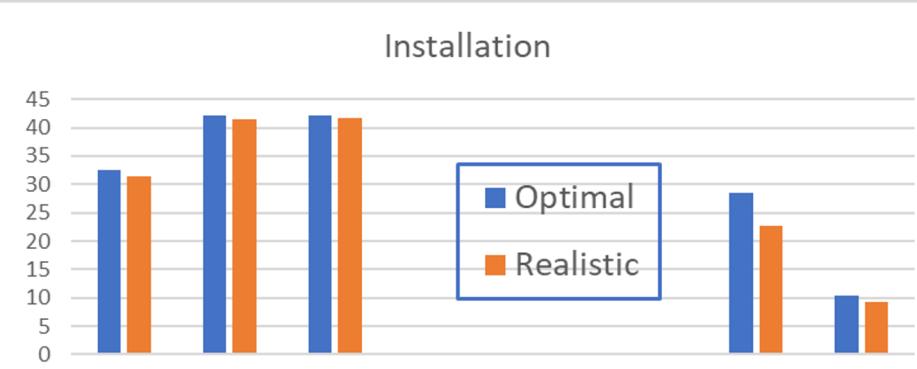


## Reduction in Impact Risk

	%
Fish & Cephalopods	8.3
Sublittoral sediment	6.2
Mammals	8.8
Birds	1.4
Water column	2.0

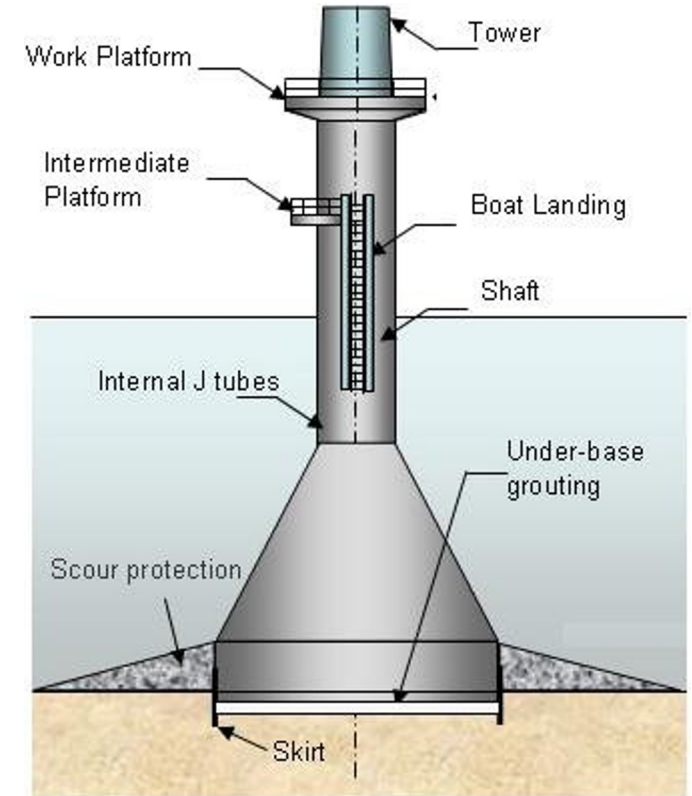
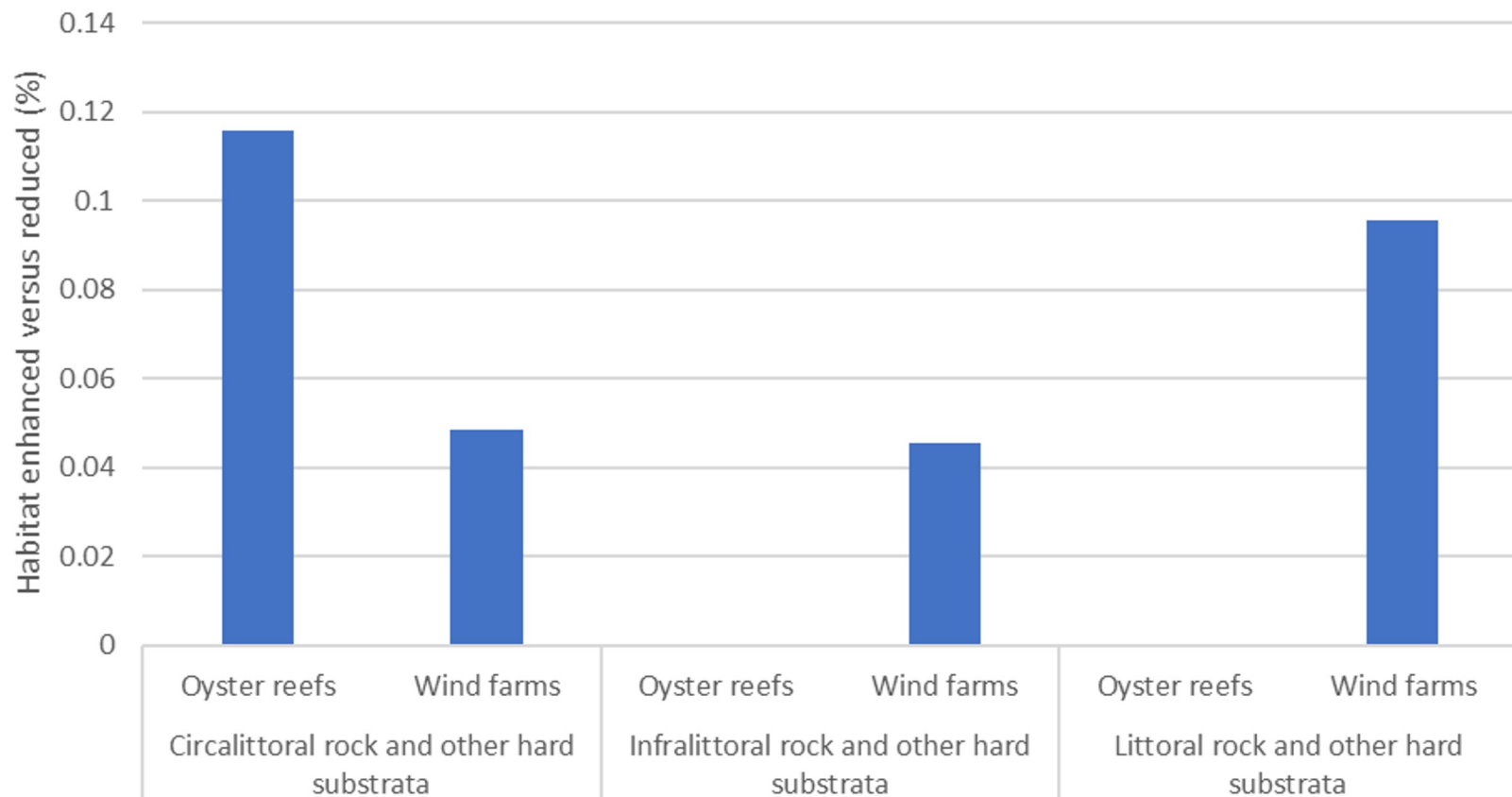
# Scope for Optimal MU design

- Impact Risk (IR) reduction is highest in the Installation phase with relatively little scope for MU improvement
- The relatively small reduction in IR during the Operation phase can potentially be doubled
- There is scope for a considerable further reduction of IR on all the seabed habitats through improvements in MU design



# Assessing Nature restoration relative to wider ecosystem

Contribution of pilot to North Sea hard substrate habitats



# Environmental Impact Risk Assessment: conclusions

- Can be applied to any MUCL project consisting of multiple (sectoral) activities but heavily dependent on **location-specific data** (or strong assumptions)
- Requires a **Baseline** assessment (i.e. before/without the project) for **Multi-Use** configurations to be assessed against **Single-Use**
- The assessment methodology facilitates **optimization in MU design**
- The method allows an assessment of potential **environmental gains** (e.g. from nature restoration) to balance negative impacts