

Deliverable 7.3.

Sustainability Goals of Business Models





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Abstract	In this first version of the deliverable resulting from the activities carried out in Task 7.3, a comprehensive sustainability assessment of the ULTFARMS business models is provided, analysing their alignment with the Sustainable Development Goals (SDGs) and the European Union Taxonomy. Through a detailed examination of circular economy principles, the document assesses the financial eligibility and investment potential of innovative business strategies. By integrating methodological frameworks and preliminary findings, the report offers actionable insights into addressing global challenges such as



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	climate change, clean energy, and water resource protection. Designed as an evolving document, it serves as a strategic tool for understanding the intersection of business innovation and sustainability, highlighting potential opportunities for both private and public sector investment while providing a dynamic perspective on sustainable and circular business model development.
Keywords	Business models, Sustainability Goals, Circular Economy, EU Taxonomy



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Acronyms

BBE	BBE Modaecke GmbH
BMC	Business Model Canvas
BMs	Business Models
CapEx	Capital Expenditures
CSRD	Corporate Sustainability Reporting Directive
DNSH	Do No Significant Harm
DTU Acqua	Denmarks Tekniske Universitet Acqua
ESDR	European Sustainable Report Development Report
ESG	Environmental, Social, Governance
EU	European Union
FuE	Forshungs und Entwicklungszentrum Fachhochschule Kiel GmbH
GSDR	Global Sustainable Development Report
HIDROMOD	HIDROMOD Modelacao EM Engeharia LDA
Hortimare	Hortimare BV
Impactg	Impactg Energy & Marine Limited
KERs	Key Exploitable Results
KMF	Kieler Meersfarm GmbH & CO KG
KPIs	Key Performance Indicators
LTA	Low-trophic aquaculture
MSS	Minimum Social Safeguards
NACE Nomenclature Statistique des Activités Economiques dans la Communauté Européenne	
NFRD	Non-Financial Reporting Directive
NS	Nordic Seafarm AB
ODA	Official Development Assistance
OpEx	Operational Expenditures
PARKWIND	Parkwind Jera Group
RBINS	Institut Royal Des Sciences Naturelles de Belgique
SBMs	Sustainable Business Models
SDGs	Sustainable Development Goals
SDR	Sustainable Development Report
SFDR	Sustainable Finance Disclosure Regulation
SPR	SDG Progress Report
TRL	Technology Readiness Level



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UGent Universiteit Gent
UGOT Goteborgs Universitet
ULTFARMS.....Circular Low Trophic Offshore Aquaculture In Wind Farms And
Restoration of Marine Space
UN United Nations
UNGPs UN Guiding Principles On Business And Human Rights
WP Work Package
WR.....Stichting Wageningen Research



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Executive Summary

This deliverable is the result from the work carried out in Task 7.3 and presents a **comprehensive sustainable and circular assessment of the preliminary Business Models (BMs)** proposed within the ULTFARMS project, focusing on their contribution to the **Sustainable Development Goals (SDGs)** and alignment with the **European Union Taxonomy**. This analysis aims to determine the potential eligibility of these models for financing and funding, with the goal of attracting both private and public investors and enhancing their ability to effectively contribute to a sustainable future.

This is a preliminary analysis of the project results from the first two years, recognising the iterative nature of project exploitation. In agreement with the project coordinators and WP7 lead partners, an initial version is provided in accordance with the grant agreement, with a final comprehensive version planned upon completion of the WP5 deliverables. **The current document provides initial insights, with the understanding that the final assessment of circularity and sustainability will be carried out at the end of the project.**

The methodology used in this document includes a general overview of the ULTFARMS BMs, focusing on their operational strategies, market positioning and innovative practices, which will be developed in detail in the WP5 deliverables. **An analysis was conducted to examine how these BMs are aligned with the SDGs and the EU Taxonomy, including a custom circularity analysis specifically designed for the ULTFARMS project, complemented with the information extracted in a co-creation workshop organised in Delft on 25th November 2024.**

This document will serve as a critical tool to empower ULTFARMS partners by providing actionable insights to improve the sustainability of their business models. It highlights potential funding opportunities and encourages the adoption of sustainable practices that contribute to both individual business success and broader societal goals. **As the first version of the document, it includes preliminary findings, methodologies, templates and examples that provide an overview of the project's circularity, sustainability, impact and relevance.**



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1. Introduction

ULTFARMS is a collaborative project led by a consortium of industry leaders and academic institutions, supported by the European Union's Horizon Europe program. **ULTFARMS aims to develop and promote innovative and sustainable solutions** for low-trophic aquaculture production and nature restoration in offshore wind farms. The project utilizes renewable energy sources and integrates low trophic aquaculture and nature restoration with offshore wind energy production to address the challenges of food security and sustainable production of both food and energy.

This document is a first version containing an analysis of the preliminary results obtained and discussed with the partners during the first two years of the project, considering that the exploitation of this project is an iterative process and that until the end of the project we will not have the final results to be exploited and finally evaluated from the point of view of circularity and sustainability. Due to this problem, it was decided together with the project coordinators and the lead partners of WP7 to deliver a first version on the date included in the GA and a final version after the completion of the WP5 deliverables.

The transition to a sustainable and circular economy requires a concerted effort, and this deliverable aims to promote a deeper understanding of how innovative Business Models (BM)s can play a key role in this transformation. Moreover, circular strategies in marine renewable energy and sustainable aquaculture can reduce ecosystem disturbance, promote biodiversity conservation and create economic value through innovative technologies that restore rather than deplete marine resources.

Circularity and sustainability in BMs represent a transformative approach to economic development that moves beyond traditional linear "take-make-dispose" models. By redesigning processes to minimize waste, maximize resource efficiency, and create regenerative systems, more circular and sustainable business models will address critical environmental challenges while generating economic value.

In the context of multi-use ocean platforms, **sustainable and circular BMs play a crucial role** in aligning marine wind energy, aquaculture and marine ecosystem conservation with the EU Taxonomy and the Sustainable Development Goals (SDGs). By implementing regenerative approaches that minimise environmental impacts and maximise resource efficiency, these models directly support some SDGs, as number 14 (Life Below Water).



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This deliverable presents a comprehensive assessment of the sustainability of the preliminary ULTFARMS BMs articulated in Task 5.3, focusing on their contributions to the SDGs and their alignment with the EU Taxonomy. **The assessment of these BMs aims to determine their potential eligibility for financing and funding**, and to attract potential private and public investors, thereby enhancing their capacity to contribute effectively to the transition to a sustainable future.

The **SDGs set by the United Nations have been integrated into our methodology** and serve as a universal blueprint for achieving a better and more sustainable future for all, encompassing a wide range of social, environmental and economic goals. By aligning ULTFARMS BMs with these goals, we provide a holistic view of their contribution to sustainable development and identify how these BMs can address pressing global challenges such as climate change, affordable and clean energy, and the protection of water resources.

On the other hand, **the EU Taxonomy is a key framework to guide and stimulate investment in sustainable activities across the EU**. It provides a classification system that identifies environmentally sustainable economic activities, thereby facilitating transparency and accountability in the financial sector. This framework not only supports the EU's commitment to achieve climate neutrality by 2050, but also encourages companies to adopt practices that are in line with sustainability principles. In this context, **this deliverable examines how proposed BMs meet the criteria set out in the EU Taxonomy** to ensure that they are not only viable, but also able to attract the financial resources necessary to thrive.

In summary, **this document provides an overview about the circularity and sustainability of the ULTFARMS BMs developed from the preliminary Key Exploitable Results**, which in its final version will include, as a result, a collection of Business Briefs that will be used for decision makers in finance and funding organisations. An example and template of how to develop such Business Briefs has been included in this version of the document for clarification (Appendix 4. Business Brief , page 106).



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2. Sustainability Goals and EU Taxonomy

Sustainability and sustainable development are interrelated concepts often used as synonyms. Although they share goals and principles, they differ in scope and application. Sustainability refers to the ability to maintain a certain state or condition indefinitely. In the context of environmental and social issues, it represents a balance between economic growth, environmental protection and social well-being¹. On the other hand, sustainable development is a process that can be continued either indefinitely or for a given period. In summary, the sustainability term means to meet the needs of the present without compromising the ability of future generations to meet their own needs^{2,3}

The United Nations Sustainable Development Goals (SDGs)⁴ and EU Taxonomy⁵ are two closely related frameworks aimed at advancing sustainability and fostering responsible environmental and social practices. Both initiatives have different purposes and approaches to be taken into account for the development of future Sustainable Business Models (SBMs)⁶.

The **SDGs** provide a comprehensive global framework addressing several aspects of sustainable development such as poverty, inequality, climate change and environmental protection. They serve as a reference point for countries, organizations and companies to guide their policies and strategies.

The **EU Taxonomy** is a classification system specifically designed to identify environmentally sustainable economic activities within the European Union. It sets out detailed criteria for environmental objectives, helping stakeholders, particularly investors and companies, to ensure that their activities are aligned with environmental sustainability standards.

Overall, **the EU Taxonomy could be seen as a practical tool to achieve the SDGs**. In this sense, the EU Taxonomy is based on the principles of the SDGs and supports their implementation by providing actionable guidance for environmentally sustainable practices. Additionally, while the SDGs offer a stable overarching framework, the EU Taxonomy is an evolving instrument that adapts to scientific and technical advancements.



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2.1 Sustainable Development Goals



Figure 1. Sustainable Development Goals panel.

The 2030 Agenda for Sustainable Development is ambitious in scope and significance, hoping ***“to end poverty and hunger everywhere; to combat inequalities within and among countries; build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the***

***lasting protection of the planet and its natural resources*”**⁴. The 2030 Agenda was established by the Heads of States and Government and High Representatives in the United Nations (UN) in 2015⁴.

The General Assembly of the UN adopted this action plan setting 17 SDGs (Figure 1), 169 targets and over 220 unique indicators, **committing to the States** the mobilisation of the necessary means for its implementation in a period of 15 years (Appendix 1. SDGs targets and indicators, page 65.)

Therefore, SDG are structured as follows:

- **SDG 1: “No Poverty”**, which aims to end poverty in all its forms everywhere, achieving the end of extreme property globally by 2030. It comprises 7 targets and 13 indicators to measure the state of implementation of this particular SDG.
- **SDG2: “Zero Hunger”**, which aims to end hunger, achieving food security and improved nutrition and promote sustainable agriculture. It includes 8 targets and 14 indicators.
- **SDG3: “Good Health and Well-Being”**, which aims to ensure healthy lives and promote well-being for all at all ages, achieving a universal health coverage and equitable access of healthcare services to all men and women. This goal has 13 Targets and 28 indicators.
- **SDG4: “Quality Education”**, which aims to provide an inclusive and high-quality education that will improve the learner's standard of living and the community's future. In total, it consists of 10 targets measured by 11 indicators.



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- **SDG5: “Gender Equality”**, which aims to grant women and girls equal rights and opportunities to live free of violence and discrimination, including the workplace. The SDG has 9 targets that are measured by a total of 14 indicators.
- **SDG6: “Clean Water and Sanitation”**, which aims to ensure availability and sustainable management of water and sanitation for all. It has 8 targets with its corresponding 11 indicators.
- **SDG7: “Affordable and Clean Energy”**, which aims to ensure access to affordable, reliable, sustainable and modern energy for all. The goal includes 5 targets and 5 indicators.
- **SDG8: “Decent Work and Economic Growth”**, which aims to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. In this sense, the goal has 12 targets with 17 indicators to measure completion.
- **SDG9: “Industry, Innovation and Infrastructure”**, which aims to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. In addition, the goal has 8 targets to be conducted by 2030, and progress is measured by 10 indicators.
- **SDG10: “Reduced Inequality”**, which aims to reduce inequality within and among countries. In this sense, the UN defined 10 targets and 11 indicators to evaluate the progress.
- **SDG11: “Sustainable Cities and Communities”**, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable. It includes 10 targets and 15 indicators to monitor progress toward achieving these objectives.
- **SDG12: “Responsible Consumption and Production”**, which aims to ensure sustainable consumption and production patterns. This goal has 11 targets and 13 indicators to track advancements in areas such as waste reduction and efficient use of resources.
- **SDG13: “Climate Action”**, which focuses on taking urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy. It includes 5 targets and 8 indicators that assess efforts in climate resilience, adaptation, and mitigation strategies.
- **SDG14: “Life Below Water”**, which aims to conserve and sustainably use the oceans, seas, and marine resources for sustainable development. There are 10 targets, and 10 indicators to measure progress in preserving marine ecosystems and reducing ocean pollution.

- **SDG15: "Life on Land"**, which seeks to protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests, combat desertification, halt and reverse land degradation, and biodiversity loss. This goal comprises 12 targets and 14 indicators to assess implementation.
- **SDG16: "Peace, Justice, and Strong Institutions"**, which aims to promote peaceful and inclusive societies, provide access to justice for all, and build effective, accountable institutions at all levels. It has 12 targets and 23 indicators to monitor achievements in governance, justice, and peacebuilding.
- **SDG17: "Partnerships for the Goals"**, which aims to strengthen the means of implementation and revitalize the global partnership for a sustainable development. It includes 19 targets and 25 indicators that measure international cooperation, resource mobilization, and capacity-building efforts to achieve the SDGs.

SDGs are closely related to sustainability and its three pillars: environment, society and economics dimensions. It is essential to understand these goals as a cohesive, integrated system instead of discrete, unrelated parts⁷ (Figure 2).

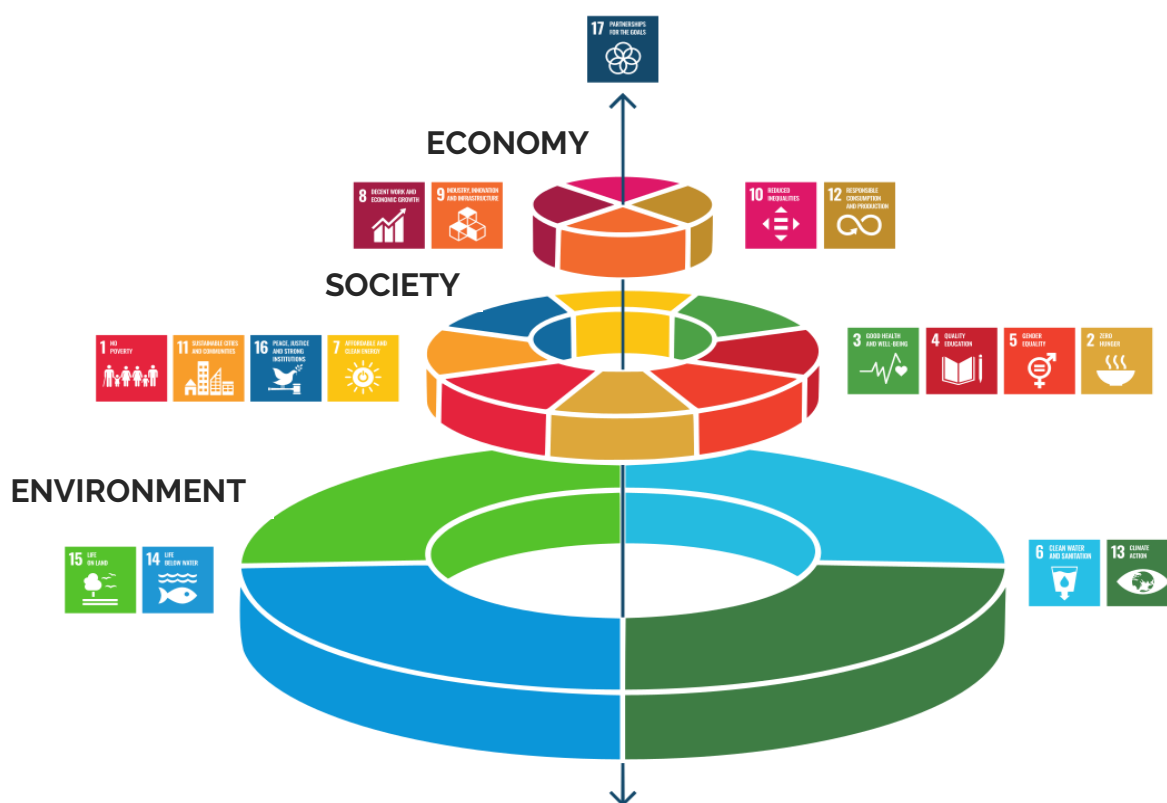


Figure 2. Adapted SDGs wedding cake proposed by Stockholm University



As noted earlier, each goal is linked to several targets, and each target is supported by a minimum of one indicator (Appendix 1. SDGs targets and indicators, page 65). These indicators were developed to facilitate the monitoring and review progress in the implementation of the SDGs and targets⁴. Since 2016, the UN has published every year a SDG Progress Report (SPR) and a Global Sustainable Development Report (GSDR) every four years. In addition, there are other independent experts publishing their own analysis, such as the Sustainable Development Report (SDR) published yearly. The scopes, depths and focuses of each publication are also different. In this sense, SPR is focused on the overall progress towards the SDGs, with a scope that could be considered global and regional, being the data treated in a moderate depth in the metrics analysed. On the other hand, GSPD tries to emphasize on the global trends in SDGs progress detected between the last and the new report, with an in-depth view in metrics. In addition, SDR scope is more specific to aspects of sustainable development, with also an in-depth view in metrics. The last reports published are: SPR 2024⁸, GSDR 2023⁹ and SDR 2024¹⁰, where the UN indicated that only a 17% of the targets are progressing as expected to be achieved by 2030, and worryingly, most targets are showing a moderate or marginal progress (48%), while a significant number of targets are stagnating or even regressing (35%). Overall, the metrics are indicating Zero Poverty (Goal 1); Clean Water and Sanitation (Goal 6); Climate Action (Goal 13); and Peace, Justice and Strong Institution (Goal 16) are the ones which more active action should be performed (Figure 3).

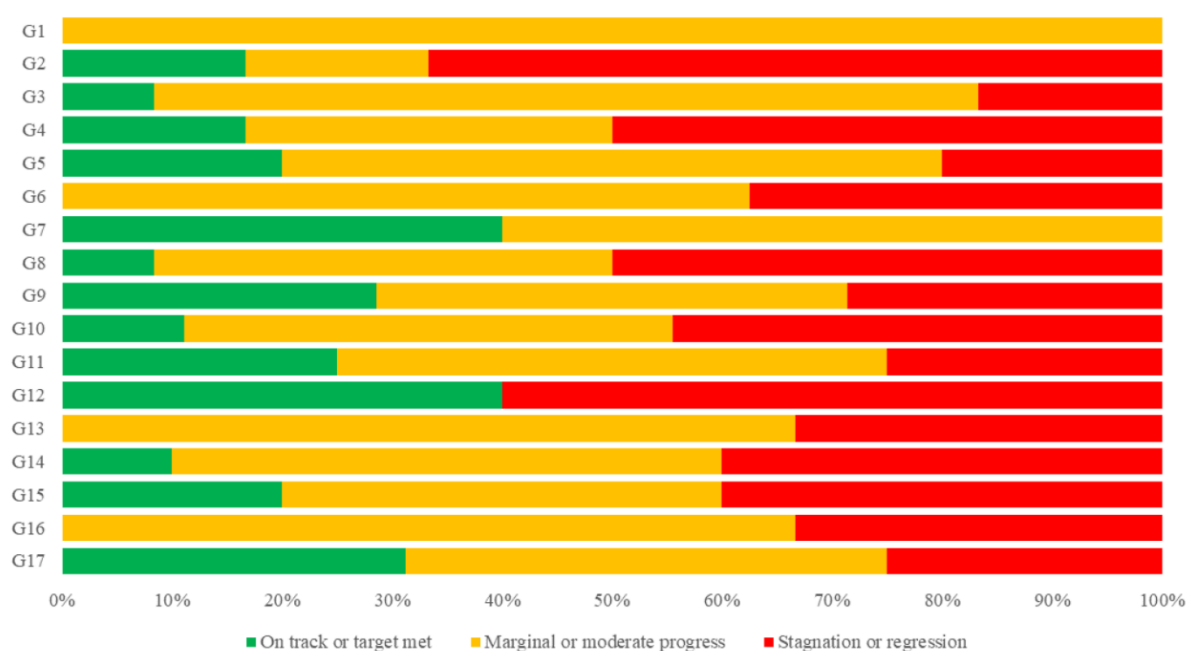


Figure 3. Progress assessment for the 17 Goals based on assessed targets with trend data by goal published in the SPR from 2024.



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However, it is crucial to examine the unique contexts of EU members in contrast to global conditions. On one hand, EU has integrated the SDGs into its core policy, legislation and funding frameworks¹¹, on the other, EU is the leading donor of Official Development Assistance (ODA)¹². In the last European Sustainable Development Report 2023/2024 (ESDR¹³), the progress made towards achieving the different targets is that at least two-thirds of the SDG targets are either already achieved or on track to be achieved by 2030 (Figure 4).

Nonetheless, the current state falls significantly short of what is desirable. In terms of progress, there is a clear stagnation in four of them: Zero Hungry (Goal 2); Responsible Consumption and Production (Goal 12), Climate Action (Goal 13); Life below water (Goal 14); and Life on Land (Goal 15, Figure 4). Additionally, the implementation process reveals marked differences when examined through the North-South and West-East geographical perspectives.



Figure 4. SDGs trends in the EU by ESDR 2023/2024.

It is therefore necessary to focus on the specific locations of ULTFARMS pilots (Figure 5). As short summary, there are six pilots distributed in the North and Baltic Sea basins. Three are in North Sea: Belwind (Belgium), Borssele (The Netherlands) and Fino 3 (Germany); while the other three are in Baltic Sea: Anholt (Denmark), Samsø (Denmark) and Fino 2 (Germany)⁹.



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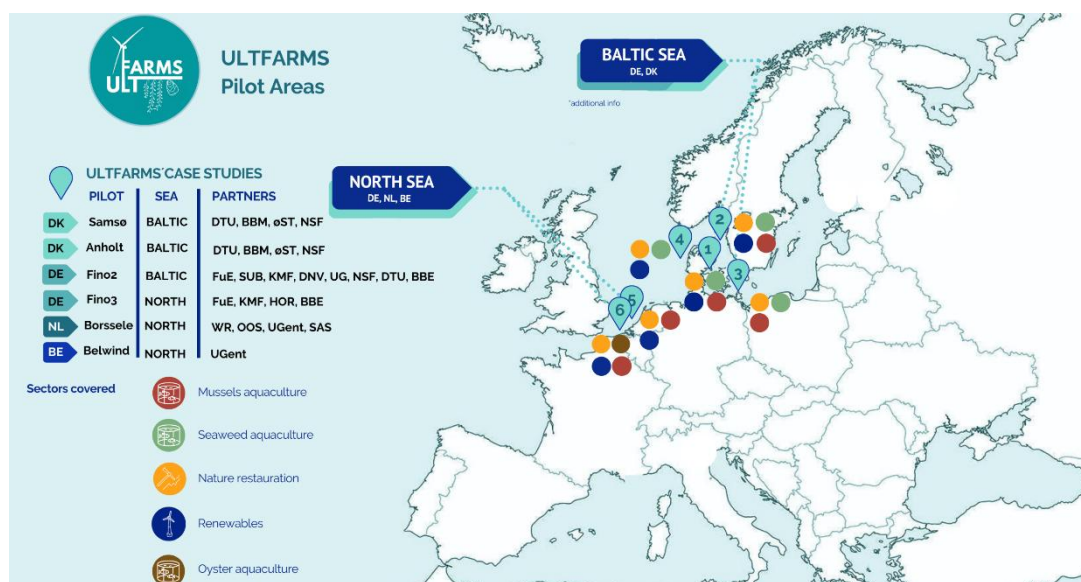


Figure 5. ULTFARMS pilots' distribution, partners involved, and sectors developed. Pilots are located with numbers Samso (1), Anholt (2), Fino 2 (3), Fino 3 (4), Borssele (5) and Belwind (6).

A detailed overview per pilot is included below (Figure 6):

- **Belgium** has achieved about 12% of the SDGs (2 out of 17): No Poverty (Goal 1) and Reduce Inequalities (Goal 10). In contrast, 35% of the goals has remain challenging with a moderate improvement (6 out of 17), 6% of the goals remain challenging with stagnation (1 out of 17) and 24% of the goals remain challenging with a stagnant score (2 out of 17) or moderate improvement (2 out of 17). In addition, 24% of the goals have major challenges remaining with scores stagnating (4 out of 17), including: Responsible Consumption and Production (Goal 12), Climate Action (Goal 13), Life Below Water (Goal 14), and Partnerships for the Goals (Goal 17).
- **Denmark** is one of the best-performing countries in Europe (rank 3rd out of 34 countries), having already achieved 23% of the SDGs (4 out of 17): No Poverty (Goal 1); Industry, Innovation and Infrastructure (Goal 9), Reduced Inequalities (Goal 10) and Partnerships for the Goals (Goal 17). For 35% of Goals, challenges remain but the score is moderately improving or on track (6 out of 17), for 12% challenges remain with a stagnated score (2 out of 17) and for 12% significant challenges remain with a score that is stagnating or moderately improving (2 out of 17). Unfortunately, there are still 18% of the SDGs where major challenges remain with stagnated scores (3 out of 17),



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including: Responsible Consumption and Production (Goal 12), Climate Action (Goal 13), Life Below Water (Goal 14).

- **Germany** has only achieved 6% of the SDGs (1 out of 17), which is Partnerships for the Goals (Goal 17). Challenges remain for 41% of Goals, where the score is moderately improving or is on track (7 out of 17). There are still 18% of Goals where challenges remain but the score is stagnating (3 out of 17) and 18% where the score is moderately improving (3 out of 17). For 18%, there are still major challenges remain with scores stagnating or moderately improving (3 out of 17), including: Zero Hunger (Goal 2), Responsible Consumption and Production (Goal 12), and Climate Action (Goal 13).
- **The Netherlands** has achieved 12% (2 out of 17), being No Poverty (Goal 1); and Industry, Innovation and Infrastructure (Goal 9). For 29% of the SDGs, there are remaining challenges with moderate improvement or stagnation (5 out of 17). For 24% challenges remain with stagnation or improved scope (4 out of 17). However, for 35% (6 out of 17) major challenges remain with scores improving (Goal 12 and 17), stagnated (Goal 13, 14 and 15) or decreasing scores (Goal 2).



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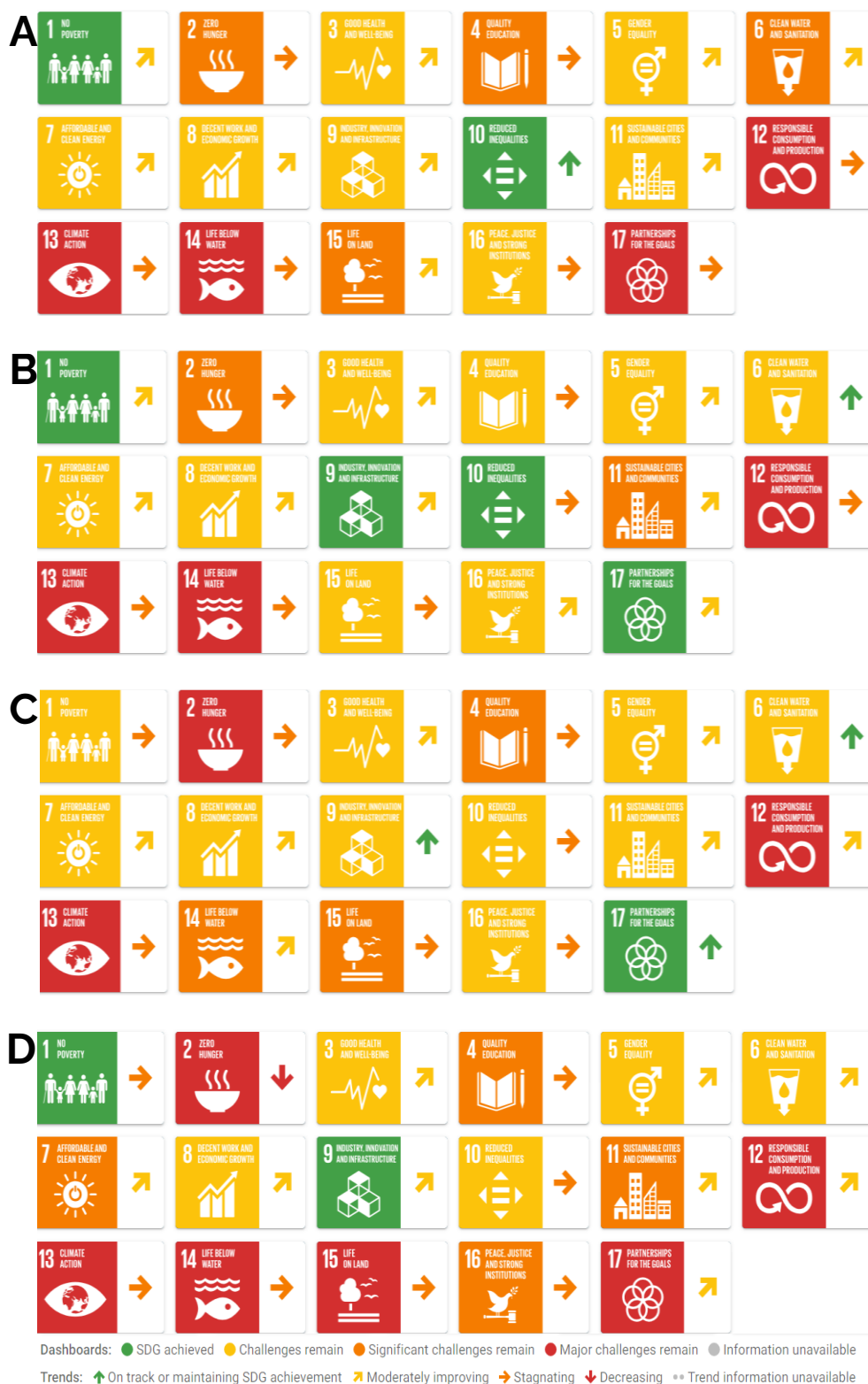


Figure 6. Performance of the SDGs by country reported in the last ESDR 2023/2024. Belgium (A), Denmark (B), Germany (C) and The Netherlands (D).



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2.2 EU Taxonomy

The EU Taxonomy represents a pivotal mechanism within the EU's comprehensive plan to address climate and energy challenges by 2030. It establishes a uniform classification system for environmentally sustainable activities, guided by three primary objectives:

- **Encourage sustainable investments** through the establishment of environmentally friendly economic activities. The Taxonomy guides towards sustainable options, driving funding for green initiatives.
- **Enhance transparency** by the creation of a common framework that qualifies as “sustainable”, reducing greenwashing and building trust in sustainable finance.
- **Support economic transition** by aiding companies and investors in adopting sustainable practices and technologies, helping them align with environmental goals.

Overall, **the EU Taxonomy aims to empower investors with the tools to make informed decisions, assist companies in transitioning to sustainable activities, and influence policymaking within the European Green Deal¹⁵.**

The EU Taxonomy qualifies an activity as environmentally sustainable when meets the following conditions:

- Contribute to one of the six environmental objectives: Climate Change Mitigation, Climate Change Adaptation, Sustainable use of Water and Marine Resources, Transition to a Circular Economy, Pollution Prevention and Control and Protection and restoration of biodiversity and ecosystems
- Do No Significant Harm (DNSH) to the other five objectives
- Meet minimum social safeguard such as Human Rights or Labour standards
- Complying with the Technical Screening Criteria

Technical Screening Criteria are a group of rules and metrics used to evaluate whether an economic activity might be considered environmentally sustainable. The criteria are therefore designed to ensure that activities considered 'green' are those that contribute to the EU's climate and environmental objectives without causing significant harm to other environmental or social objectives.

When examining economic activities, it is crucial to understand their classification into three key segments: activities with direct environmental impact, transitional



activities currently dependent on high-carbon approaches, and supportive activities that create pathways for substantial environmental progress¹⁶.

The EU Taxonomy reporting is a regulatory requirement for both non-financial and financial entities that wish to promote sustainable finance. In order to achieve this objective, the EU has introduced a series of regulations that require entities to provide comparable information. These regulatory requirements are **the Non-Financial Reporting Directive (NFRD)**, **the Corporate Sustainability Reporting Directive (CSRD)**, and **the Sustainable Finance Disclosure Regulation (SFDR)**. Table 1 shows the scope, key requirements, timeline, and goals of the different directives discussed above and their relationship with the EU Taxonomy:

Table 1. EU Taxonomy-related Directives^{16, 17}

	NFRD	CSRD	SFDR	EU Taxonomy
Scope	Large public-interest entities with more than 500 employees	Large companies, regardless of legal form	Financial market participants offering investment products, and financial advisers	Financial market participants. All companies subject to CSRD
Key Requirements	Report on policies, risks, outcomes, and key performance indicators related to Environmental, Social or Governance (ESG) issues	Mandatory sustainability reporting, digital reporting system	Disclosure of ESG integration in investment decisions, information about the sustainability impact of investments	Turnover, capital, and operational expenses from items or activities related with Taxonomy
Timeline	In January 2024, the NFRD was officially replaced by the CSRD.	Applicable since January 1, 2023	Applicable since March 10, 2021	Applies from January 2022
Goals	Increase Transparency Comparability of data in sustainability report Qualitative and quantitative information	Improve quality, scope, and consistency in sustainability reports	Improve and foster sustainability in the financial sector Comprehensive reporting framework for financial products and entities.	Classification system for sustainable economic activities
Reporting Period	The first CSRD report of companies within the scope of NFRD is due in 2025 for the financial year 2024.	Starting from reporting period 2024	Starting from reporting period 2022	Starting from reporting period 2021



Another perspective on the EU Taxonomy highlights its potential as a multifaceted instrument: enabling access to sustainable financial resources, aligning with investor requirements, achieving green product recognition, minimizing reputational vulnerabilities, and supporting comprehensive green economic transition. The Taxonomy Regulation sets out three groups of Taxonomy users¹⁸:

- Financial Market Participants, offering financial products in the EU
- Large Companies who are already required to provide a non-financial statement under the Non-Financial Reporting Directive
- The EU and Member States when setting public measures, standards or labels for green financial products or green corporate bonds

Related to the EU Taxonomy is the EU Sustainable Finance Framework. Figure 7 shows its foundations, including the EU Taxonomy, and the Environmental, Social and Governance (ESG) factors into investment decisions within the financial sector; ensuring that private financial flows are channelled to relevant economic activities²¹, and it is organised as follows:

1. EU Taxonomy. A classification system of sustainable activities
2. Disclosures. A disclosure framework for non-financial and financial entities
3. Tools for investments

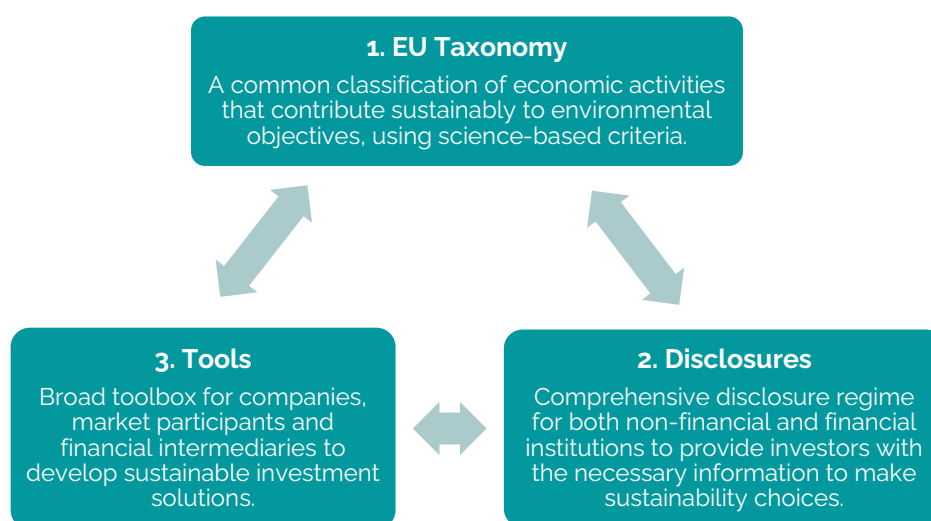


Figure 7. EU Taxonomy, tools and disclosures

The implementation of the EU Taxonomy may require financial actors or delegate to data providers to carry out a five-step verification process.

The **five steps** of the verification process are described as follows¹⁸:

- **STEP 1:** Identify the key operations carried out by the firm, issuer, or those covered by the financial product.
- **STEP 2:** Examine each potentially aligned activity to see if the firm or issuer passes the appropriate screening requirements.
- **STEP 3:** Verify that the issuer meets the DNSH requirements.
- **STEP 4:** Conduct due diligence to avoid any infringement of the social minimum protections outlined in Article 13 of the Taxonomy Regulation.
- **STEP 5:** Calculate investment alignment with the Taxonomy and create investment product-specific disclosures.

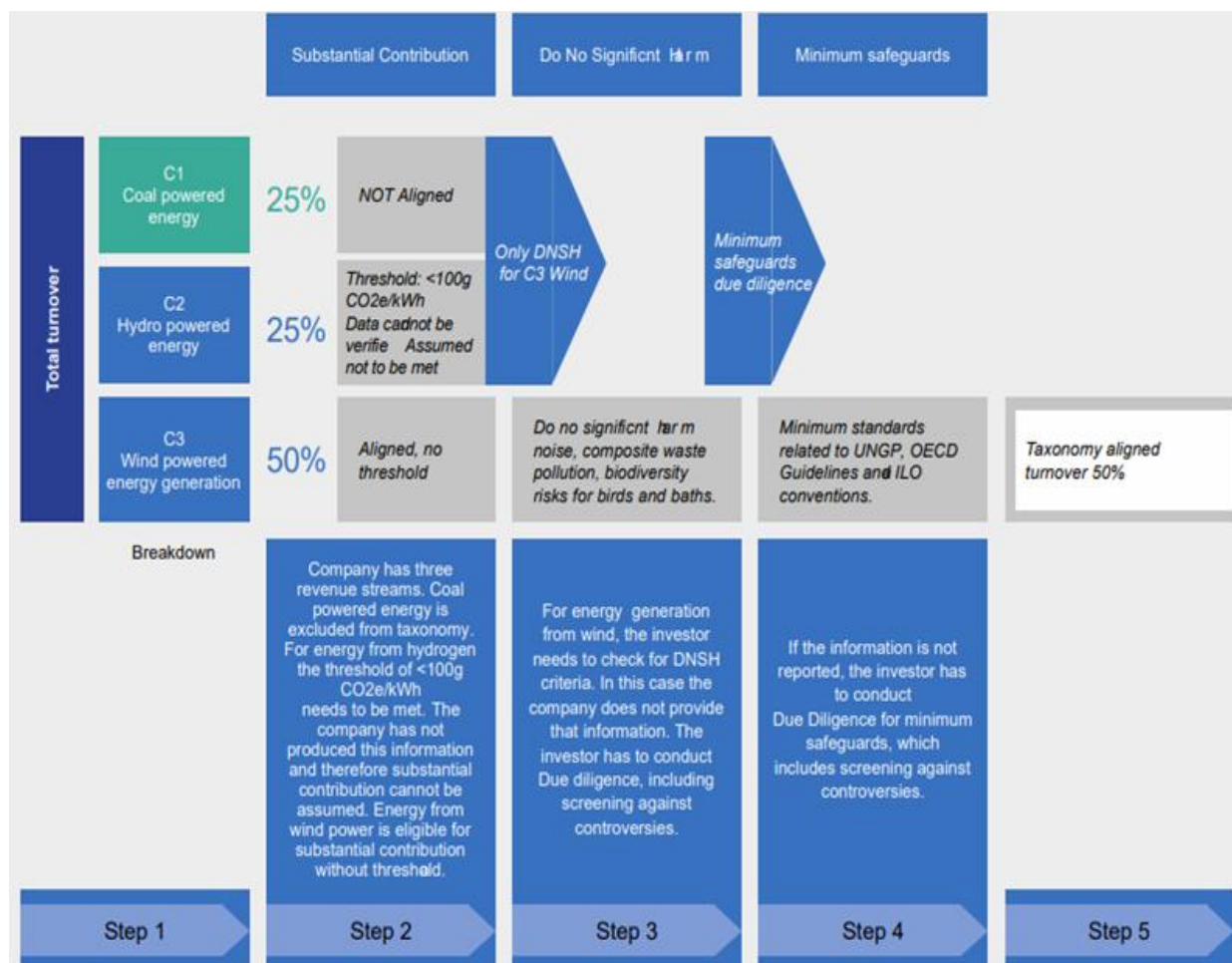


Figure 8. Process for applying the EU Taxonomy. Final Report of the Technical Expert Group on Sustainable Finance¹⁹.



Figure 8 shows how EU Taxonomy applies to investment in companies. This example represents the total turnover of a company that engages in three types of activities. These activities generate: Coal Energy, Hydro Energy and Wind Energy. In this case, Coal is not in the scope of the EU Taxonomy (not eligible), but hydropower and wind energy are in scope of the EU Taxonomy (eligible). The eligible activities are classified by their sustainability and, subsequently, the company must verify that the activities meet the requirements of the DNSH (related to waste biodiversity risk for example) and analyse the social safeguards to comply with basic social policy requirements.

In a nutshell, the Table 2 summarizes the steps and key points to be considered in the EU Taxonomy, including **Eligibility Screening, Alignment Screening and Minimum Social Safeguards**. In addition, it sets out the requirements, potential issues that may arise during the analysis and possible solutions that may be helpful in addressing them.

Table 2. EU Taxonomy key concepts¹⁹

	Eligibility Screening	Alignment Screening	Minimum Social Safeguards
Requirements	- To Identify eligible activities from the predefined list²⁰ - To calculate the turnover, Capital and Operational Expenditures (Respectively, CapEx and OpEx , WP5).	- To perform technical screening of eligible activities - To calculate necessary KPIs.	A Final report on Minimum Safeguards should be defined. These are: - Human Rights - Bribery/Corruption - Taxation - Fair competition
Problems	- Names of processes are different from the activities predefined - Definitions of turnover, CapEx and OpEx are diffuse - Lack of financial data	- Lack of data available to be collected by companies - Unclear definition of some criteria and calculation requirements.	Lack of data on Minimum Social Safeguards (MSS). The lack of data on MSS is therefore not a sign of a lack of data, but of a low level of implementation of the UN Guiding Principles On Business And Human Rights (UNGPs), and thus of alignment with MSS²¹.
Solutions	- Activities based on "Nomenclature Statistique des Activités Economiques dans la Communauté Européenne" (NACE) codes²⁰ - Collect financial data base on the requirements established by EU Taxonomy	- Taxonomy Experts. - Regularly monitor updates in regulations - Automatic screening.	The solution is not to ask for more data, but to engage with companies to implement the six steps of the UNGP.



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EU Taxonomy screening offers a multifaceted approach to organizational decision-making. It serves as a crucial tool for meeting regulatory obligations, managing reputation risks, and discovering potential improvement areas. The accompanying EU Green Bond Standard, a voluntary framework introduced by the EU Commission as part of its sustainable economic transition strategy, provides an additional financial benefit. These green bonds frequently attract more favourable market pricing, effectively rewarding organizations for their detailed Taxonomy screening processes²².



3. ULTFARMS Business Models Assessment

3.1 Methodology

Task 7.3 consists of assessing the contribution of business models to broader sustainable goals. It is therefore closely linked to **Work Package 5-Commercialisation: Exploitation and Business Planning** (WP5) and the activities carried out such as the definition of **exploitable results and market analysis** (Task 5.1), **business modelling and commercialisation planning** (Task 5.2), and **economic analysis and financial viability** (Task 5.3)²³.

As the activities of WP5 are still ongoing during M24 and are expected to be completed by the end of the project. The current methodology shall be succinctly outlined (Figure 9):

- **Identification of expected Key Exploitable Results (KERs).** A structured survey was developed using Microsoft Forms® and distributed to the consortium partners. The aim of the survey was to assess, evaluate and analyse the expected project results with high potential for exploitation in scientific, societal or political applications²⁴. It is therefore essential to prioritise those KERs with higher commercialisation potential. This prioritisation has not yet been done for several reasons: firstly, some of them are still being tested or even not yet considered; secondly, not all of them will reach a Technology Readiness Level (TRL) suitable for commercialisation. However, it is important to note that commercialisation should not be the only eligibility criterion. Without prioritization, a total of 19 outcomes were identified some of which were restructured or even eliminated after discussion with partners in face-to-face meetings and processing of the information. In the end, the total number of preliminary KERs is 16. A more detailed overview of the process will be given in D5.2 and a summary in section 3.2.
- **Co-creation of potential Business Models (BMs).** A real BM simplifies complex business concepts but requires considerable effort to define and structure multiple elements to ensure long-term success. One of the aims of this deliverable is to provide information and highlight the importance of including sustainability in the equation. Therefore, it was decided to co-create Business Models Canvas (BMC) between consortium partners and CTA and continue with the task instead with formal BMs. In short, a BMC allows for an understandable approach with less effort, allowing to have a theoretical approximation of the BMs. In addition, these meetings provided



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an opportunity to clarify issues and go deeper into the 16 potential BMs (section 3.2)

- **ULTFARMS Business Models' contribution to sustainability.** A second survey was designed to understand were considering not only the use of their results, but also their alignment with SDGs and EU Taxonomy (sections 4 and 5).
- **ULTFARMS business models alignment to SDGs and EU Taxonomy.** As final step, the information was analysed, and key conclusions were developed.

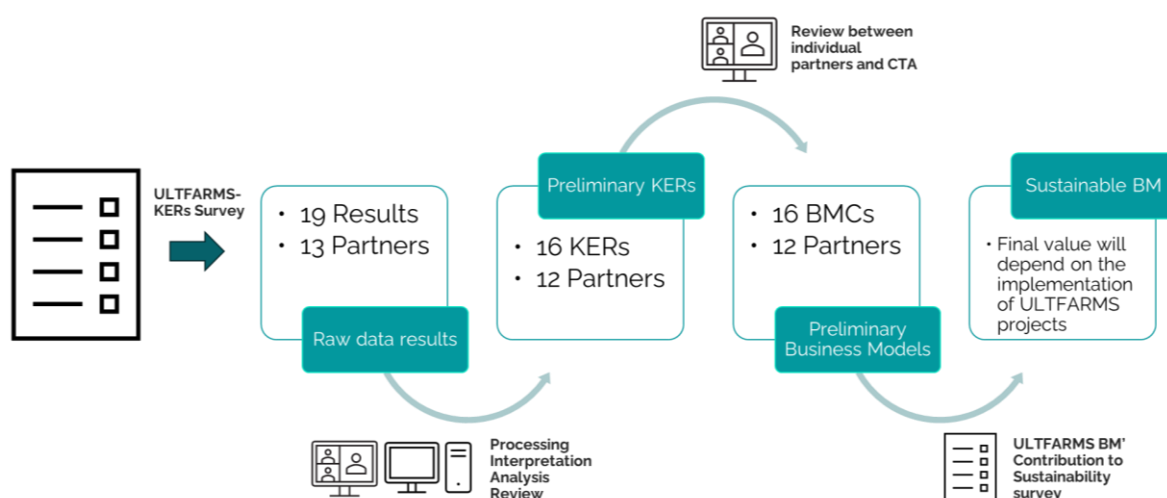


Figure 9. Methodology implemented for the identification of preliminary KERs, BMs and SBMs.

3.2 Preliminary Business Model Definition

BMs are powerful tools that describe the way a business operates²⁵, presenting complex concepts to highlight how value is offered, created, delivered, and captured in a chosen market or industry⁶. Therefore, BMs help managers and organisations to analyse, develop and communicate their business effectively from a value-based perspective²⁶.

A BM is a complex document that considers many aspects. In order to simplify the understanding of the business and to show the essential aspects, business models are traditionally presented in a Canvas where nine elements are showed together "at a glance" (BMC).



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These elements are defined and shown as follows (Figure 10):

1. **Customer Segments:** Identification of the most important customers, or target clients, to ensure the success of the business.
2. **Customer Relationships:** Describe the manner of customer interaction with the business throughout the sales process, including post-sales interactions.
3. **Communication, Distribution & Sales Channels ("Channels"):** The strategies employed to facilitate effective engagement with customers, encouraging the provision of services, the completion of purchases, and the enhancement of brand awareness.
4. **Value Propositions:** The objective is to elucidate the advantages offered by the product to the client, the issues resolved for them, and how the product distinguishes itself from the competition. This can be achieved through the formulation of a concise and compelling message that encapsulates the unique value proposition of the product and justifies its purchase.
5. **Key Resources:** It is concerned with the strategic assets that are required to enhance the product.
6. **Key Activities:** To provide a value proposition to clients, it is essential to identify the tasks that must be completed. These tasks should be prioritized to determine which processes and actions are most crucial for delivering the value proposition and for generating revenue. In addition, it is vital to consider the key resources that are required to complete these tasks. These can include human, financial, physical, or intellectual resources.
7. **Key Partnerships:** Determine which vendors and strategic partners, both current and prospective, can assist clients most efficiently.
8. **Cost Structure:** To gain an accurate picture of a company's expenditure, it is necessary to identify all expenses related to the organization and consider methods to reduce them. It is essential to ensure that the costs in question are relevant and directly connected to the company's core operations.
9. **Revenue Streams:** In defining revenue streams, it is essential to establish clear links between these and the customer segments, value propositions, and channels involved. The use of specific and quantitative language is therefore vital to ensure the accuracy and transparency of the process.

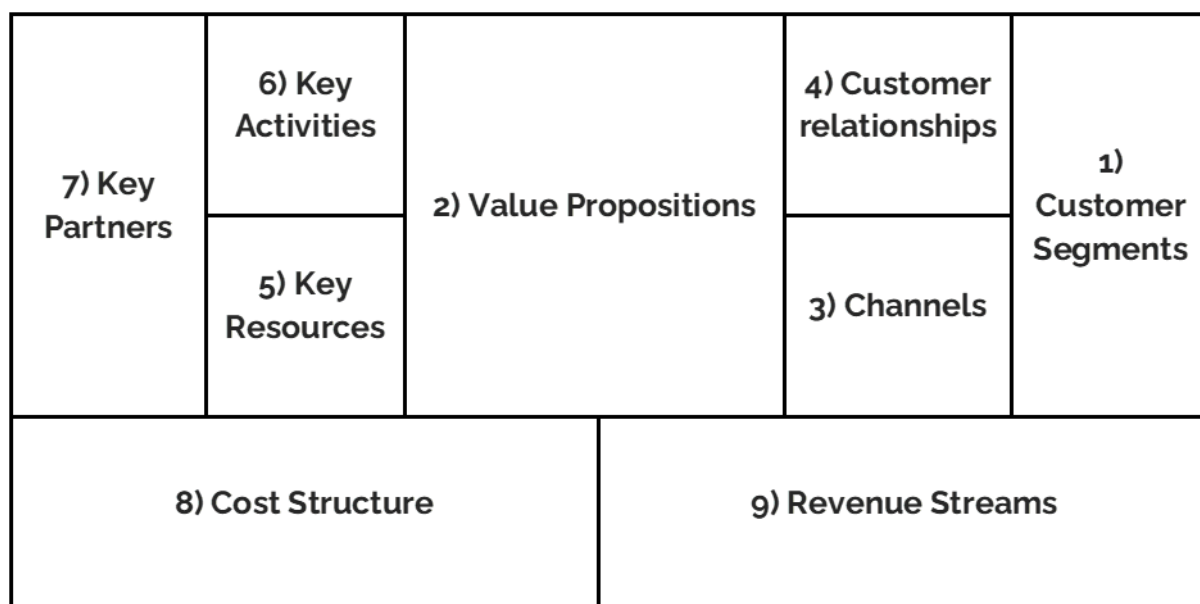


Figure 10. Structure of a Business Model Canvas

Considering that not all the results of a project are potentially marketable and therefore suitable for the generation of BMs, the identification of KERs is a cornerstone and requires prioritization and collaboration between all consortium partners. With a total of 16 KERs identified, it is neither practical nor efficient to fully develop BMs for all of them at this stage.

In this way, to have some preliminary BMs for Task 7.3, BMCs were developed for each selected KERs, described in Table 3. Using BMC, require less effort and provide a simplified framework to explore potential market opportunities, ensure alignment between technical and business efforts, and, to some extent, advance the integration of sustainability considerations in the early stages of business model design.

These preliminary Business Model Canvases (BMCs) are foundational drafts intended to guide subsequent strategic discussions and modifications and are not included in this document. Instead, Table 3 gives a detailed description of the products or services that support each BMC, providing more reliable information at this stage. By concentrating on the product's potential and its alignment with sustainability, this approach sets a strong basis for refining and prioritizing business models as the products and services develop further.



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Table 3. Main description of preliminary BMs associated with products and services under development during ULTFARMS implementation.

ID	BM	Description	Partner	Area
1	SeaStrut-SW	SeaStrut-SW is an adaptation of a variable buoyancy device previously developed by Impact-9. The new system provides flotation support for seaweed farming. It is compatible with both submersible and semi-submersible farm structures.	Impact9	Structure
2	AQUASAFE/HISEA ICT platform	HISEA is a fully customisable, open-source ICT platform designed to deliver user-friendly services. It integrates data from multiple sources, including real-time and near real-time data, and features high-resolution models for hydrodynamics, wave activity, transport and dispersion processes.	HIDROMOD	Consultancy services
3	Submersible tube and net systems for growing blue mussels	The new system is designed for growing blue mussels consisting of a complete arrangement of nets and tubes that can be submerged to fixed depths in a user-controlled manner. This design aims to protect the mussel from damage due to adverse weather conditions.	DTU Acqua	Structure
4	Cultivation of seaweed/oyster/mussels at offshore windfarms	Cultivation in marine farms at offshore wind farms requires skilled coordination, strict safety protocols and resource sharing. This approach focuses on several critical aspects, including the safety of personnel, the management of vessels, and the protection of assets. Ensuring that these factors are addressed for successful integration of aquaculture practices within wind farm operations.	PARKWIND	Consultancy services
5	Empirical coefficients of seaweed net and mussel dropper	Understanding the behaviour of seaweed nets and mussel droppers under high-energy conditions, both unloaded and loaded, is crucial for designing efficient and resilient aquaculture systems. The expected results are forces, motions and empirical coefficients integrated in a numerical model.	UGent	Software
6	Delivery of seed material and discussion of ideal farming structures	Breeding and use of endogenous seaweed species, supplying high-quality seed material. Therefore, it is required to develop methodologies for seaweed scale-up, cultivation and ideal aquaculture structures that ensure an optimal production.	Hortimare	Biomass
7	Adapted-MoorDyn simulation	Computer simulation to assess the behaviour of an offshore aquaculture mooring system subjected to waves and current loads. The results are simulated forces and motions of the aquaculture systems to be installed in the Belgian pilot.	UGent	Software



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8	Screw anchor	The screw anchor design, installation and decommission represent a step toward improving aquaculture infrastructure in a highly energetic offshore environment. The screw anchors are drilled into the seafloor which reduces the risk of movements of the whole aquaculture system and provides a greater level of structural integrity. In addition, the relatively small surface area required can contribute to mitigate impacts to the benthic environment.	UGent	Structure
9	Offshore LTA consulting services	The experience gained from various projects implemented constitutes valuable and intangible knowledge. This knowledge base can be leveraged through consulting services offered by the Belgian Pilot partners. Among others, the services can be focused on longline infrastructure design and installation; screw anchor design, installation and decommission; optimized vessel layout; environmental impact assessment; nature inclusive design; environment restoration; and permitting, insurance, and legal aspects.	UGent	Consultancy services
10	German consulting services	German pilot partners have accumulated knowledge in planning, operating and analysing offshore aquaculture projects that includes technological logistics and infrastructures. Due to the experience in the implementation of offshore aquaculture projects, they have access to a catalogue of major blueprints for planning and implementing of related projects.	FuE	Consultancy services
11	Nearshore infrastructure for testing platform.	A dedicated nearshore test facility for equipment and material trials is available. Prototypes could be tested before using flexible aquaculture system adaptable for different offshore structures.	KMF	Structure
12	BBE FluoroProbe. Remote monitoring for offshore mussel aquaculture compliance	A new approach is in development to design a remote monitoring method to fulfil the legal EU requirements to produce mussels applicable for offshore locations. The monitoring method will enable the mussel harvesting based on food safety assessments, improving operational efficiency and cost effectiveness.	BBE	Sensor
13	Biodiversity enhancement through establishing an artificial reef; with BESE-products;	The artificial reef is a zero carbon, circular and slowly biodegradable reef restoration system which can be placed underneath aquaculture sites, to locally stimulate formation of biogenic reefs by polychaete species, mussels or oysters. Therefore, it is expected that also become an initial point for the recovering of biodiversity for North Sea. The experience gained during the implementation of ULTFARMS project allows for the best settings and the installation to maximise performance.	WR-BESE	Consultancy services



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14	Automated image recognition system	An automated image recognition system is under developing to monitor mussel density and recognise other species growing on aquaculture systems and artificial reefs. It is based on deep learning through convolution neural networks, a specific type of neural network designed for processing structured data such as images or video.	WR	Sensor
15	Seaweed strain and seedling development for Baltic conditions	Biological and technical methods are being developed to cultivate endogenous seaweed strains and seedlings sourced from the Baltic Sea, enhancing compatibility with the local ecosystem and minimizing risks to biodiversity.	UGOT & NS	Biomass
16	Habitat restoration in a multi-use context	Expertise in how to conduct habitat restoration in an ocean multi-use context.	RBINS	Consultancy service



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3.3 ULTFARMS BMs categorization

The list of KERs and BMs was discussed in the **First Capitalization Workshop**, held in Delft (The Netherlands) on 25th of November 2024 (Table 3). In general, the BMs typology can be categorised in five areas based on the outputs:

- **Structure:** this category includes any device, framework, or systems designed to support the aquaculture installation.
- **Consultancy services:** Given the project's complexity and its intersections with governance, environmental regulation, and legal frameworks, this area emerged as potential BMs.
- **Software:** this category includes any digital solution or computer programs developed to support data processing and/or decision-making.
- **Biomass:** this category includes methodologies that allows the seeding of endogenous seaweeds from Baltic and North Sea.
- **Sensors:** this category includes devices designed to detect specific environmental or biological changes and generate signals that facilitate monitoring or actions.

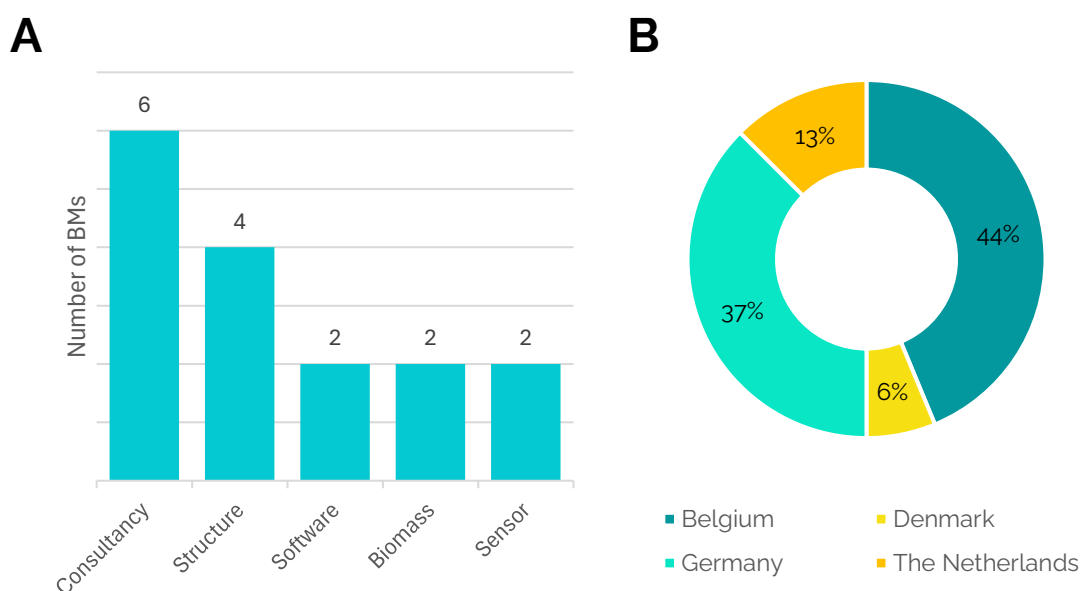


Figure 11. Preliminary BMs categorisation by area of application (A) and country distribution (B).

In summary, we have identified a total of **6 BMs involving consultancy services** ranging from the integration of multi-use areas (such as aquaculture and wind farms) to real-time weather management and exploitation of the knowledge development during ULTFARMS implementation. Additionally, **4 BMs involved in**



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structures, including innovative net systems (2), an anchor (1), an adapted nearshore structure for testing (1). The Software category includes **3 BMs focused on data modelling** (2) and automated image recognition (1). Moreover, there are 2 BMs related to seaweed biomass production. Finally, there are **2 BMs related to sensor development**, specifically for remote compliance and monitoring (Figure 11).

3.4 Sustainability assessment

Sustainability is an important aspect in the ULTFARMS project. According to the consortium, aspects such as environmental, social, and economic sustainability should be included in order to generate SBMs. To this end, a survey was prepared and distributed between ULTFARMS partners.

The sustainability survey was designed in six sections (Appendix 3. ULTFARMS BMs' Contribution to Sustainability page 100):

- **Business Model Review and Analysis Questionnaire**, which identifies the main aspects of the BM such as name, objective, service offered, target customers or users.
- **Sustainability aspects** related to the developed business model. General concepts such as social, economic, and environmental sustainability were requested.
- **Alignment with the EU Taxonomy** was evaluated, focusing on identifying activities that align with the EU Taxonomy's objectives and addressing important questions related to social sustainability.
- **R&I funding streams** were examined, with questions about the alignment of the business models with the primary funding streams in sustainable innovation.
- **Alignment with SDGs** was assessed, focusing on how the business models align with the 17 SDGs.

The results of the survey have been analysed to propose specific actions for those with weaknesses. The goal is to make the transition from traditional BMs to SBMs more in line with the scope and objectives of the ULTFARMS project.



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4. ULTFARMS Business Models alignment to SDGs

ULTFARMS aims to implement circular Low-Trophic aquaculture systems to optimise production in offshore conditions and integration in Offshore Wind Farms. For an activity to be considered aligned to the SDGs, it must contribute directly or indirectly to the achievement of specific targets set by the 2030 Agenda. This alignment does not imply that all SDGs will be met, but that the activity will have measurable, positive and sustainable impacts on the relevant SDGs and targets.

In Figure 12, it has been represented the general results obtained from the sustainability survey. The data have been sorted by dimensions proposed by the Stockholm Resilience Center⁷. Accordingly, the SDGs can be analysed in a more comprehensive way, keeping those related closer.

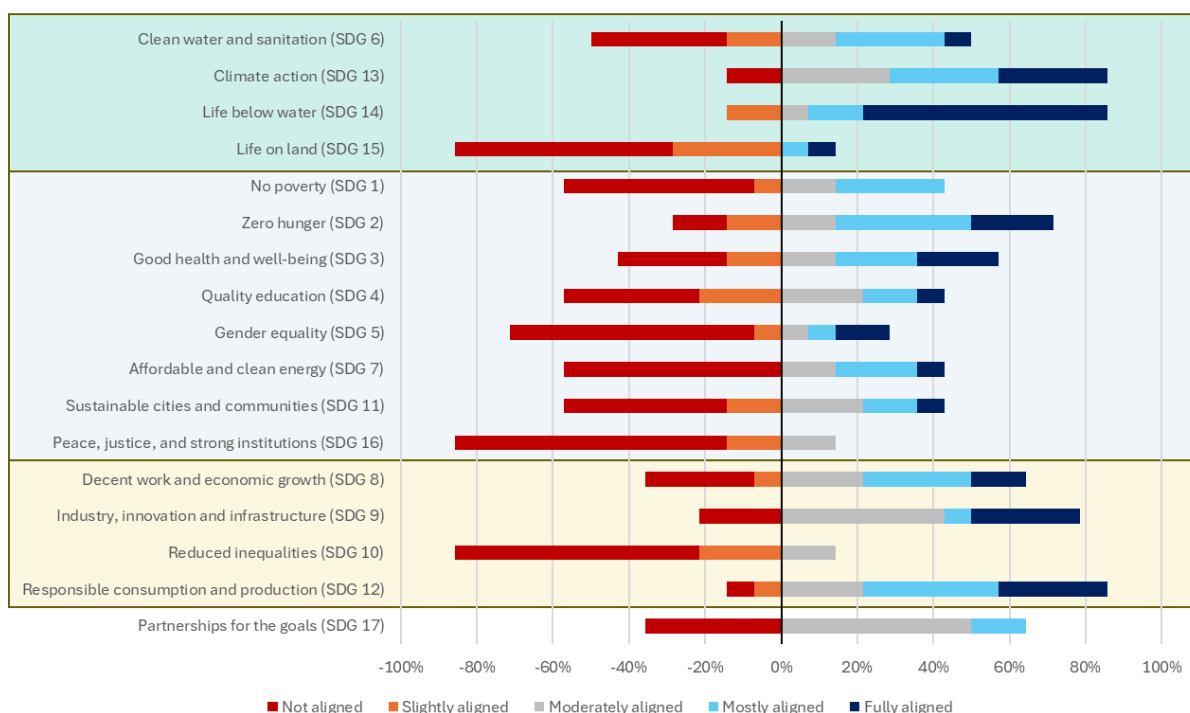


Figure 12. Global alignment of ULTFARMS' BM to SDGs. The three dimensions of sustainability has been represented: environmental sustainability (green panel), social sustainability (blue) and economic sustainability (yellow).

Overall, the analysis shows clear patterns in the alignment of BMs with the SDGs across the three dimensions of sustainability. For the **environmental dimension**, on average, approximately 59% of BMs show moderate to full alignment. Notably, 85% of BMs show a high level of alignment for SDGs 13 and 14. In contrast, **social dimension** exhibits the lowest levels of moderate to full alignment overall, with approximately 43% of the BMs on average. Within this dimension, SDG 2 has the highest alignment, with almost 72% of BMs rated as moderately to fully aligned,



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followed by SDG 3 with almost 60%. In the **economic dimension**, around 60% of BMs are on average moderately to fully aligned. Notably, SDG 8 shows alignment in over 64% of BMs, and over 80% of BMs show alignment with SDGs 9 and 12.

In summary, ULTFARMS BMs are particularly well aligned with Climate Action (SDG13, ~85% of BMs), Life Below Water (SDG 14, ~85%), Responsible Consumption and Production (SDG12, ~85%), and Industry, Innovation and Infrastructure (SDG 9, ~78% of BMs).

In addition to the global analysis, and to simplify the preliminary results, it is interesting to review the results by pilots and their potential contribution to national goals. Currently, the solutions developed in the framework of the ULTFARMS project are very limited in terms of extension and productivity. However, if scaled up, they could have a significant impact on some targets where the country is stagnating or not performing as well as desired.

It is important to clarify that the SDGs are global objectives designed to be achieved primarily at the level of nations. While individual companies and projects like ULTFARMS can align their activities with the SDGs, they cannot achieve them in isolation. For this reason, **the analysis has been developed by partners operating within the same country and therefore independently to their nationality.** The contribution to the SDGs will ultimately depend on how these solutions are integrated into broader frameworks and collective national and international efforts.



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4.1 Belgian Pilot

The preliminary BMs developed by the Belgian pilot at the time of writing this deliverable are 7. Two structures: a variable buoyancy to support seaweed farming and a screw anchor to avoid movement of the aquaculture system; two data sets to understand the behaviour of nets and droppers and the mooring of aquaculture system in high-energy conditions; and three consultancy services to exploit knowledge in the management of multi-use space, the operation of aquaculture systems and habitat restoration (Table 3, IDs 1, 4, 5, 7, 8, 9 and 16).

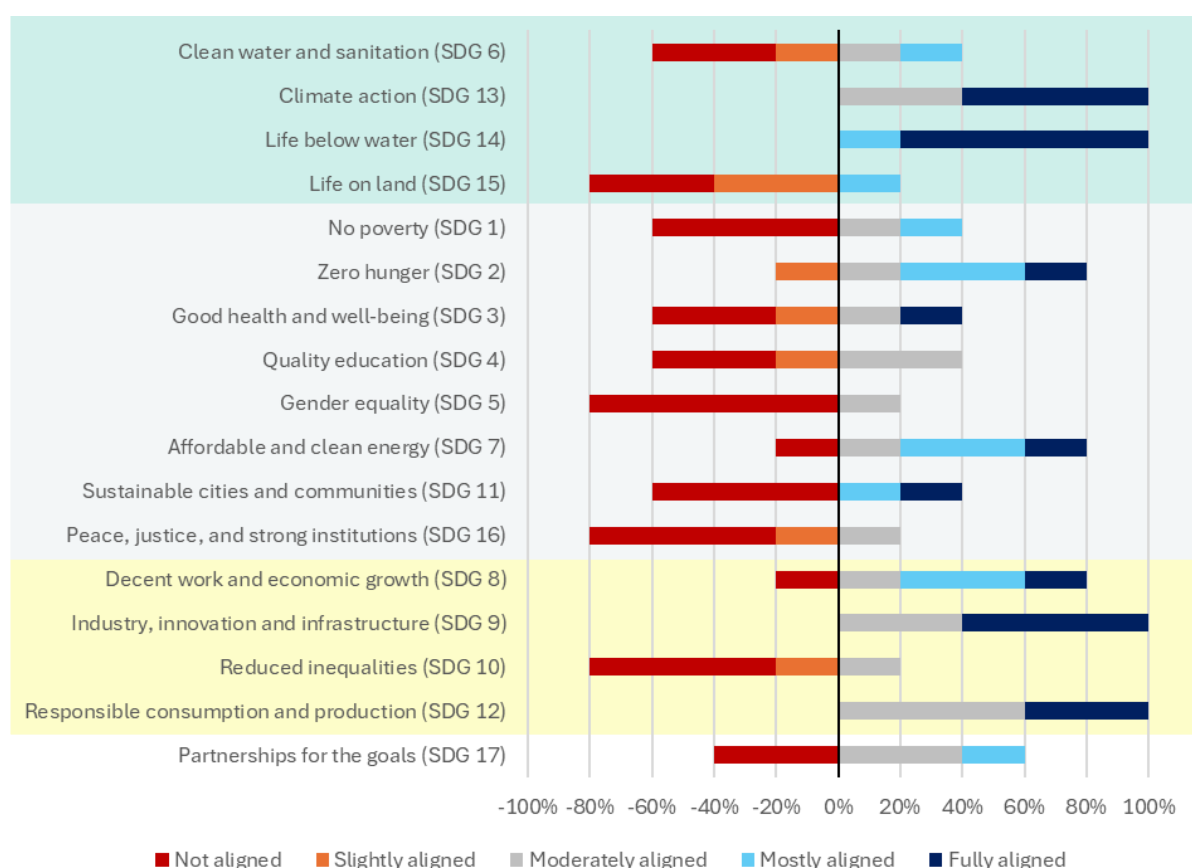


Figure 13. Alignment of preliminary BMs developed in the context of the Belgian pilot.

Overall, the Belgian pilot is testing the possibility of cultivating oysters and seaweed and using the knowledge generated by consultancy activities in a field that is growing in Belgium. The environmental and economic dimensions have on average a high level of alignment (Moderate-full) in more than 65% of the BMs. Interestingly, 100% of the BMs are rated as moderate-full alignment with SDGs 9, 12, 13, and 14 (Figure 13). As mentioned earlier, the solution tested in the pilots is quite limited at this stage of project implementation (extension and amount). If



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solutions work adequately and their use is implemented in multi-use parks, this could have a decisive impact on other SDGs (3 out of 4), where Belgium does not perform as expected (Figure 6).

4.2 Danish Pilots

The Danish pilots have initially proposed a submersible tube and net system for cultivating blue mussels (Table 3, ID 3).

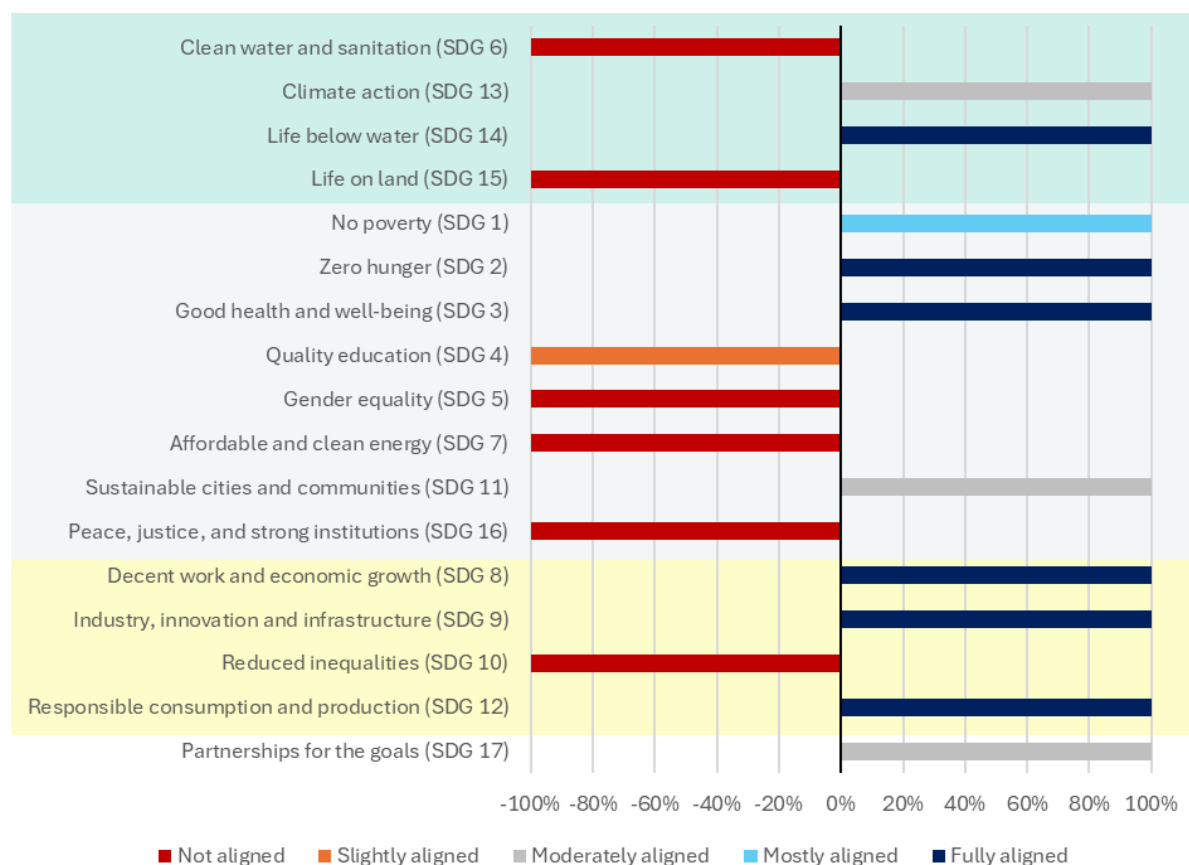


Figure 14. Alignment of preliminary BMs developed in the context of the Danish pilots (Anholt & Samsø).

The BM developed for Danish pilots is based on a submersible structure for blue mussel cultivation. The solution will improve the resilience of aquaculture systems to adverse weather conditions by modulating the depth of it in the water column. This will minimise storm damages and reduce operational costs. The system has a high level of alignment with environmental, social and economic dimensions. Regarding SDGs, the solution is aligned with 1, 2, 3, 8, 9, 11, 12, 13 and 14 (Figure 14).

Although Denmark is one of the countries with better performance and trends respecting SDGs, there is stagnation and major challenges remain in Climate



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Action (SDG 13), Life Below Water (SDG 14) and Responsible Consumption and Production (SDG 12, Figure 6), where the proposed BMs may contribute to improve trends in the middle to long term.

4.3 Dutch Pilot

The preliminary BMs developed by the Dutch pilot are 2, at the moment of writing the current deliverable: an artificial reef and an automated image recognition system (Table 3, IDs 13 and 14).

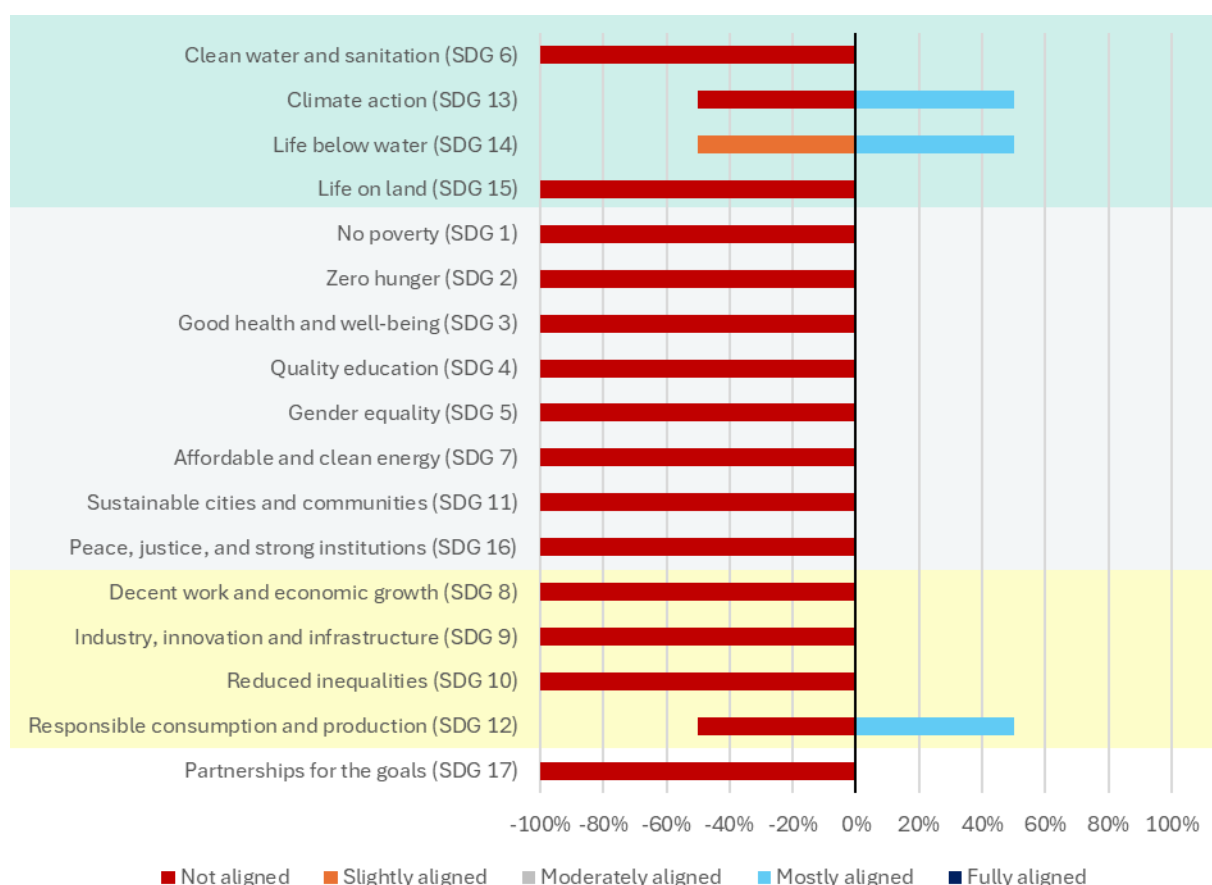


Figure 15. Alignment of preliminary BMs developed in the context of the Dutch pilot (Borssele).

The Dutch pilot is focused on the production of mussels and oysters. As part of the ULTFARMS project, new approaches to seabed restoration are being evaluated by installing biodegradable structures that will act as artificial reef underneath of the aquaculture system tested in Borssele. It is expected that the structure will facilitate the colonisation of the seabed by not only mussels and oysters, but also by other species. In fact, the detection of indicator species can show that the marine ecosystem is recovering, and the impact on biodiversity can be assessed based on scientific data. The pilot is therefore developing an automated system to



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identify mussels and other species living in and at the aquaculture site. This is expected to reduce operational cost by reducing the number of visits to the pilot site and to directly measure the improvement in biodiversity.

It is important to emphasise that both solutions are difficult to align with the SDGs in a direct way. However, it is clear that at least SDG 12, 13, and 14 are aligned (Figure 15). Extended use of both solutions could, in the medium to long term, contribute to improving the trends of the Dutch SDGs in at least 3 out of the 6 goals with the worst prospects (Figure 6).

4.4 German pilots

The German pilots focus on the production of endogenous seaweed and mussels. Fino 2 is using a specie of algae isolated from Baltic Sea, which is adapted to low salinity. Fino 3 is growing seaweed, mussels and oysters from the North Sea. Therefore, this requires the development of propagation and deployment methodologies currently under study. Additionally, a novel sensor is being developed to detect the potential presence of harmful algae species, enabling

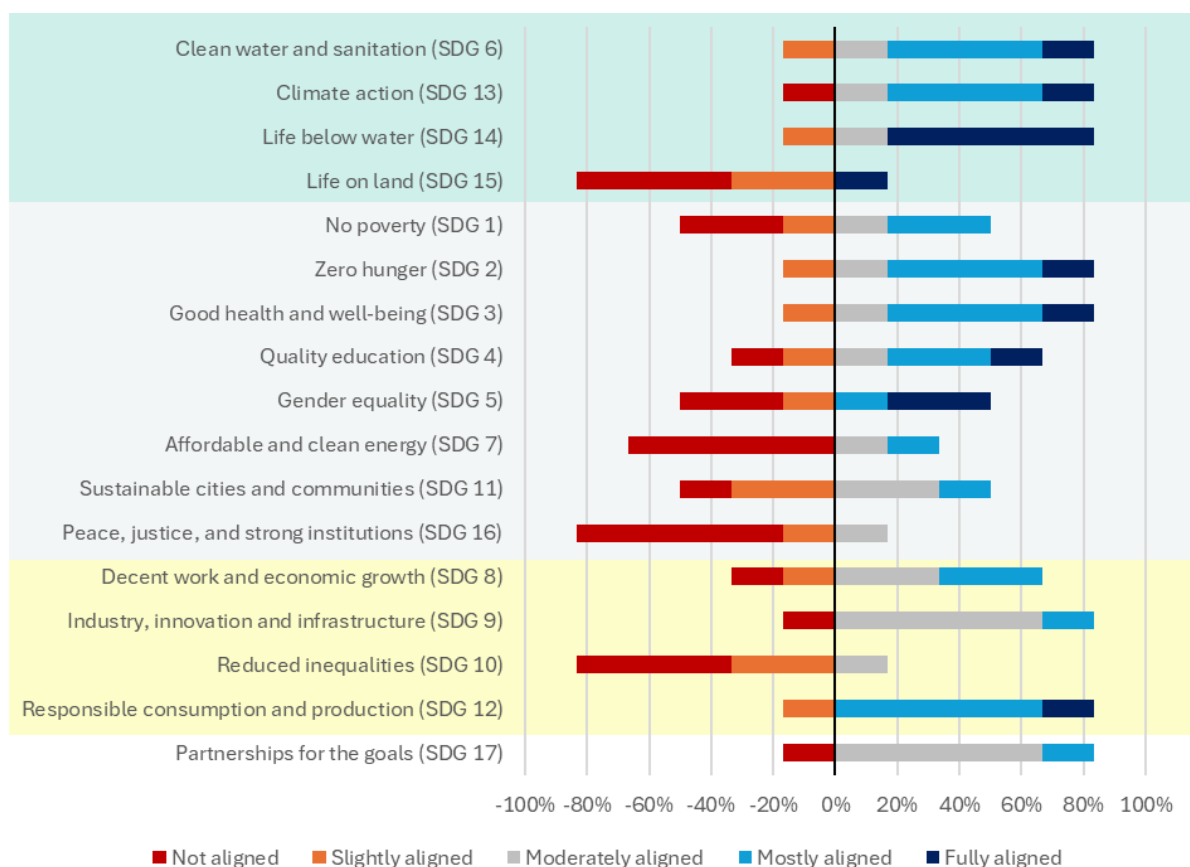


Figure 16. Alignment of preliminary BMs developed in the context of the German pilots (FINO 2 & 3).



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delays in mussel harvesting when necessary. Alongside this, the HISEA-ICT platform provides near-real-time data on weather conditions, facilitating data-driven decision-making. The expertise gained from implementing various offshore multi-use projects will also be leveraged to improve the efficiency and sustainability of the proposed business models. (Table 3, IDs 2, 6, 10, 11, 12 and 15).

In general, the German pilots are aligned with the environmental and economic sustainability dimensions, having on average more than 62% of the BMs with a high level of alignment (moderate-full). Interestingly, 83% of the BMs are rated as moderate-full alignment with SDGs 2, 3, 6, 8, 9, 12, 13, and 14 (Figure 16). Extended use of solutions could, in the medium to long term, contribute to improving the trends of the German SDGs in at least 3 goals with the worst prospects (Zero Hunger, Responsible Consumption and Production, and Climate Action, Figure 6).

4.5 BMs alignment to SDGs discussion

As described above, **ULTFARMS BMs have a clear alignment with SDGs 9, 12, 13 and 14** that it is expected to impact national goals as soon as scale up takes place (Table 4 and Appendix 1. SDGs targets and indicators, page 65).

The manufacturing of innovative nets, anchors and/or artificial reefs will have an impact on Industry, Innovation and Infrastructure goal (SDG 9). As soon as those structures start to produce in higher numbers, it will impact targets such as 9.2 or 9.3 and more specifically indicators 9.2.1 (Manufacturing value added as a proportion of GDP and per capita) and 9.2.2 (Manufacturing employment as a proportion of total employment), coordinated most probably by small-scale industries (indicator 9.3.2). In addition, some of the BMs could also impact target 9.b and more specifically indicator 9.b.1 due to the added value this type of medium and high-tech industry might bring.

The production of seaweed, mussels and oysters is in line with Responsible Consumption and Production (SDG 12) and more specifically with target 12.2 focused on sustainable management and efficient use of natural resources and its indicators 12.2.1 and 12.2.2. ULTFARMS consultancy services can have an impact on target 12.8 providing relevant information and awareness for sustainable development and lifestyles in harmony with nature.

The automatization of several process such as possible identification of blooming of hazardous algae in the farm, bad weather predictions, automated identification of mussel density and submersible nets will allow the operation and management of aquaculture systems remotely. Therefore, greenhouse emission can be reduced by preventing unnecessary traveling (target 13.2, indicator 13.2.2). Again,



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ULTFARMS consultancy services may have impact target 13.3 by awareness-raising on climate change mitigation, adaptation and impact reduction.

ULTFARMS has a high impact on Life Below Water (SDG 14), it should be considered that not all the mussels will stay in nets, or most larvae will be attached to them. Recently, it has been shown that the ability of mussels to drive habitat construction and to control the availability of resources to other organisms has been underevaluated²⁷. Mussels filter large amount of water reducing the presence of organic material and therefore improving its quality. A recovery of ecosystems might have an impact on the amount of biomass available and benefits on better-balanced conditions (Targets 14.1 and 14.2).

Table 4. Main targets of SDGs 9, 12, 13 and 14, and alignment with ULTFARMS BMs

Name	Targets	ULTFARMS
SDG 9.- Industry, Innovation and Infrastructures	9.1 Develop sustainable, resilient and inclusive infrastructures	YES
	9.2 Promote inclusive and sustainable industrialisation	YES
	9.3 Increase access to financial services and markets	NO
	9.4 Upgrade all industries and infrastructures for sustainability	NO
	9.5 Enhance research and upgrade industrial technologies	YES
	9.a Facilitate sustainable infrastructure development for developing countries	NO
	9.b Support domestic technology development and industrial diversification	NO
	9.c Universal access to information and communications technology	YES
SDG 12- Responsible consumption and production	12.1 Implement the 10-year sustainable consumption and production framework	NO
	12.2 Sustainable management and use of natural resources	YES
	12.3 Halve global per capita food waste	NO
	12.4 Responsible management of chemicals and waste	NO
	12.5 Substantially reduce waste generation	NO
	12.6 Encourage companies to adopt sustainable practices and sustainability reporting	NO
	12.7 Promote sustainable public procurement practices	NO
	12.8 Promote universal understanding of sustainable lifestyles	YES
	12.a Support developing countries' scientific and technological capacity for sustainable consumption and production	NO
	12.b Develop and implement tools to monitor sustainable tourism	NO



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Name	Targets	ULTFARMS
	12.c Remove market distortions that encourage wasteful consumption	NO
SDG 13- Climate Action	13.1 Strengthen resilience and adaptative capacity to climate-related disasters	NO
	13.2 Integrate climate change measures into policy and planning	YES
	13.3 Build knowledge and capacity to meet climate change	YES
	13.a Implement the UN Framework Convention on Climate Change	NO
	13.b Promote mechanisms to raise capacity for planning and management	YES
SDG 14- Life below water	14.1 Reduce marine pollution	YES
	14.2 Protect and restore ecosystems	YES
	14.3 Reduce Ocean Acidification	YES/NO
	14.4. Sustainable fishing	YES
	14.5 Conserve coastal and marine areas	YES
	14.6 End subsidies contributing to overfishing	NO
	14.7 Increase the economic benefits from sustainable use of marine resources	YES
	14.a Increase scientific knowledge, research and technology for ocean health	YES
	14.b Support small scale fishers	NO
	14.c Implement and enforce international sea law	NO

The interlinkage between SDGs can also indirectly improve other goals such as water quality (Target 6.3, indicator 6.3.2), an improvement on ecosystem balance and food availability can have an impact in terrestrial fauna (Target 15.5, indicator 15.5.1). Small fisher communities are often associated with risk poverty conditions and an improvement in captures will have an impact on SDG 1 (Targets 1.1 and 1.2, indicators: C010101 and C020201); Targets 1.2), on SDG 2 (Target 2.3, indicator C020301 and C020302), on SDG 8 (Targets 8.2 and 8.5; indicators C080201, C080501 and C080502), and on SDG 10 (Target 10.1, indicator C100101).



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5. ULTFARMS Business Models alignment to EU Taxonomy

5.1 ULTFARMS EU Taxonomy

There are several aspects of the EU Taxonomy for sustainable activities that align with the ULTFARMS project's objectives. In particular, those related to climate change mitigation, sustainable use of marine resources, and the transition to a circular economy.

The **ULTFARMS project addresses at least three of the six environmental objectives established by the EU Taxonomy Regulation:**

1. Climate Change Mitigation.

- Integrating low-trophic aquaculture (LTA) systems within offshore wind farms, combining sustainable food production with clean energy generation.
- Reducing the carbon footprint of aquaculture production by optimising processes in challenging offshore conditions.

2. Sustainable Use of Marine Resources.

- ULTFARMS will create a profitable, sustainable, and ecological production chain for low-trophic species (seaweed and bivalves) in offshore environments.
- Establishing six pilots in offshore wind farms across multiple European countries located in the North Sea and Baltic Sea to optimize marine species production.
- Promoting optimal production of LTA systems in harsh offshore conditions and low salinity environments through the integration of innovative engineering, technical, ecological, and biological processes.

3. Transition to a Circular Economy.

- Focusing on circular low-trophic offshore aquaculture.
- Promoting the sharing of marine space in multi-use settings and maximising resource efficiency.

The alignment of BMs with the EU Taxonomy has been assessed with the previously mentioned survey (Appendix 3. ULTFARMS BMs' Contribution to Sustainability, page 99). **To ensure the connection with the EU Taxonomy, specific questions related to the environmental and social sustainability of the BMs have been formulated in the questionnaire.**



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Figure 17 shows the general alignment of the BMs with the different EU Taxonomy environmental objectives. The ULTFARMS BMs are more aligned with: **“Use of Natural Resources”** and **“Biodiversity Conservation”**. It is noticed that while certain BMs have successfully integrated climate change considerations, others may face challenges to address critical environmental issues. This divergence highlights the complexity of aligning BMs with climate change objectives and indicates potential areas for improvement.

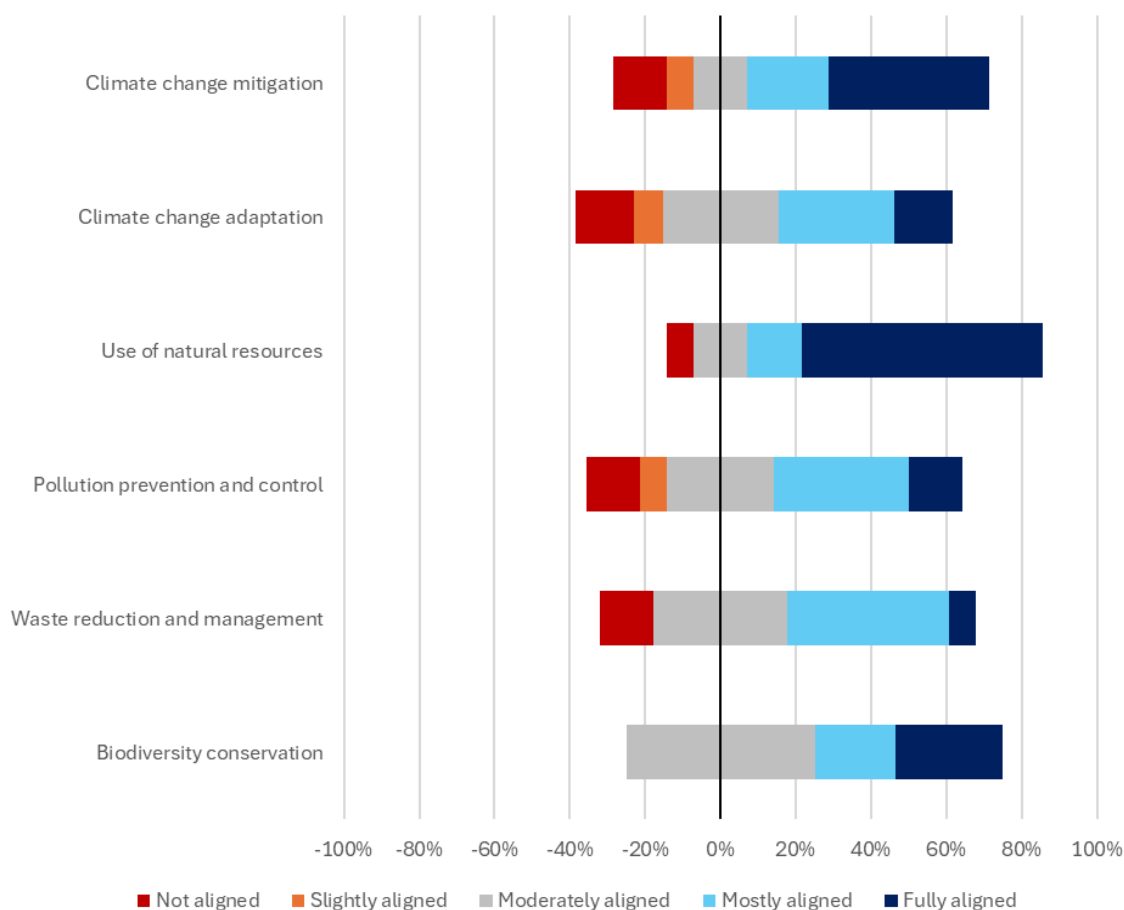


Figure 17. How is the BMs contributing to environmental sustainability on a scale from 1 to 5 in the following topics.

The EU Taxonomy sets specific criteria for classifying economic activities as environmentally sustainable or 'eligible'. One crucial requirement for an activity to be considered eligible is that it must demonstrate compliance with minimum social safeguards. These safeguards include adherence to fundamental principles such as respect for human rights and compliance with labour standards. Figure 18 shows whether BMs adopt a socially responsible approach: **‘Community**



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engagement' and **'Social responsibility'** are the most widely covered and rated as strongly aligned with almost 60% of the total. While this represents a positive trend, there is still room for growth in aligning BMs with social responsibility issues. The data suggests opportunities for improvement in addressing human rights, equality, and non-discrimination topics, areas that are crucial for comprehensive social responsibility and alignment with the EU Taxonomy's minimum safeguards. By focusing on these aspects, businesses can enhance their overall social impact and better meet the sustainability standards expected in today's socially conscious marketplace.

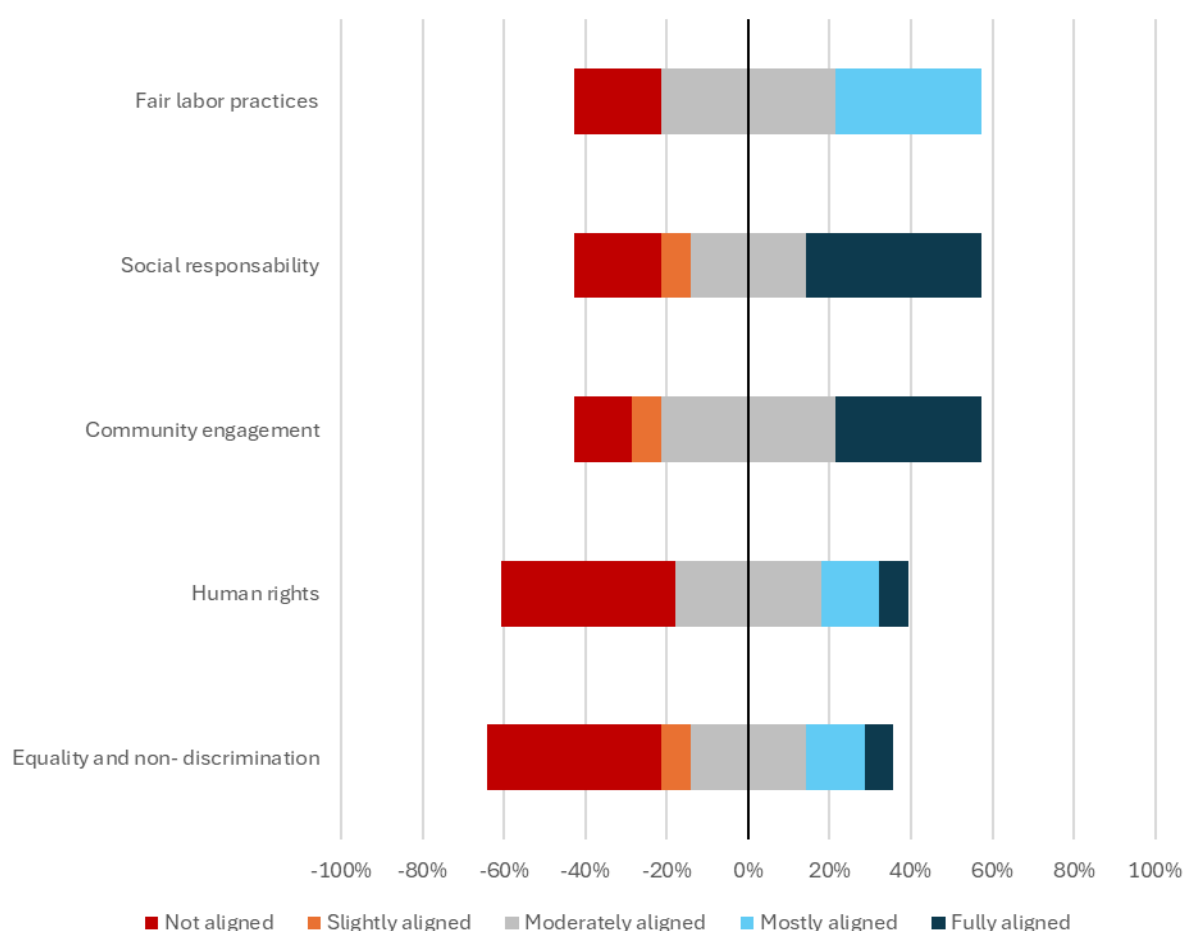


Figure 18. How is the BMs contributing to social sustainability on a scale from 1 to 5 in the following topics

The following analysis will examine **which of these preliminary BMs will be eligible under the EU Taxonomy** (particularised to each BM).

Currently, 16 BMs have been identified within the ULTFARMS project (see Table 3). The different figures shown in this section represent an analysis of 15 out of the 16



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preliminary BMs. The data for one partner's circularity questionnaire is currently pending. This deliverable serves as an initial assessment, with comprehensive results to be developed and presented in a final deliverable at the project's conclusion. This analysis will examine the preliminary findings, focusing on the BMs and the responses obtained.

For an activity to be considered environmentally sustainable, it must meet the conditions indicated in 2.2 EU Taxonomy (page 20): Contribute to one of the six environmental objectives (1), DNSH (2), meet MSS (3) and complying with the Technical Screening Criteria (4).

As part of the preliminary study to determine whether BMs align with the EU Taxonomy criteria, one of the key criteria is that they must be aligned with one of the six environmental objectives (1). This criterion was addressed in the questionnaire (Appendix 3. ULTFARMS BMs' Contribution to Sustainability, page 100). Based on the results, we have established the following evaluation: those BMs which have been assessed with a rating of 4 or 5 out of 5, are considered as aligned with the objective; those which have been assessed with a rating of 1 or 2 out of 5, are considered as being not aligned with the objective.

Figure 20 represents two radar charts. A radar chart is a two-dimensional visualization tool that uses radial axes to represent multiple quantitative variables. This type of graph is particularly useful for comparing and measuring data with several variables simultaneously. In the context of the EU Taxonomy's environmental objectives, the radar chart can be an excellent option to visualize the alignment of BMs with the six environmental objectives: climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems.

The figure is divided into two panels for easy visualisation: **Panel A** represents the climate change mitigation, climate change adaptation, and use of natural resources, and **Panel B** shows pollution prevention and control, waste reduction and management, and biodiversity conservation. Moreover, each axis represents one of the BMs. The distance from the centre of the graph to the perimeter indicates the degree of BM alignment with that specific objective: points closer to the centre (ratings 1 or 2 out of 5) indicate that the BM is not sufficiently aligned with the objective, while points closer to the perimeter (ratings 4 or 5 out of 5) indicate that the BM is aligned with the objective. By connecting the points in the graph, a polygonal shape is formed that allows a quick visualisation.

This representation facilitates the identification of strengths and weaknesses in terms of sustainability, as well as comparison between different BMs. **The data**

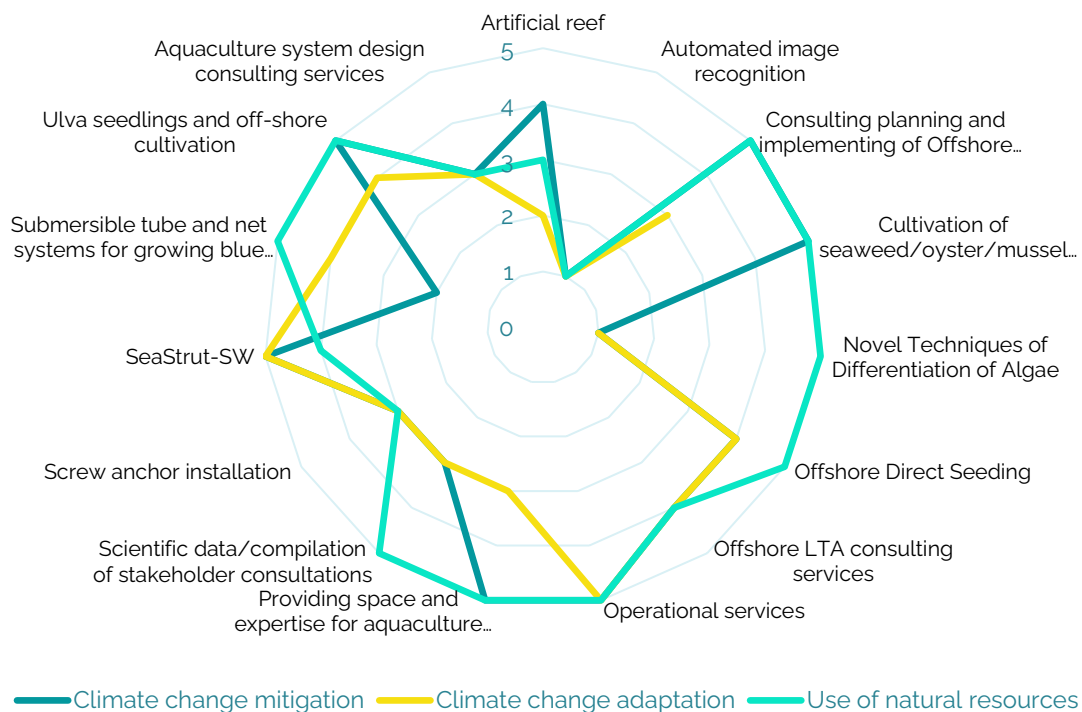


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reveals that 14% of BMs are not aligned or sufficiently aligned with at least one of the six environmental objectives. On the other hand, most of the BMs (50%) contribute to at least 4 environmental objectives.

A



B

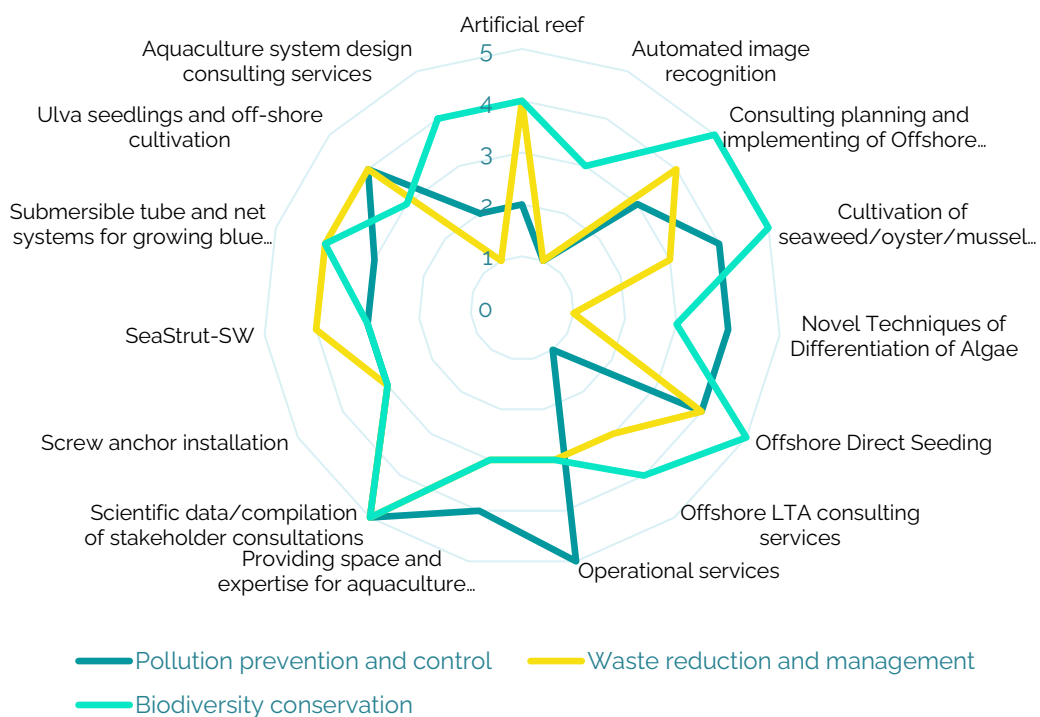


Figure 19. BMs Alignment with environmental objectives of the EU Taxonomy



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'Automated image recognition' and 'Screw anchor' have no clear alignment with one of the six environmental objectives. To address this, the following recommendations can be made:

1. Conduct a Detailed Activity Analysis

- Identify all the key processes and activities involved in the business model.
- Document the resources used, energy consumption, and any potential environmental impacts associated with these activities.
- Use tools like life cycle assessments or environmental impact assessments to identify the effects.

2. Assess Indirect Contributions

Evaluate whether the automated image recognition or screw anchor installation and decommission processes can indirectly support any of the EU Taxonomy's environmental objectives.

Once the respective BMs have been considered 'aligned' with the environmental objectives of the EU Taxonomy, other further elements must be ensured: 2) it does not negatively impact other environmental objectives ('no significant harm' or 'DNSH'), 3) it maintains minimum safeguards, and 4) 'meet the technical screening criteria' is also required. Due to the available information, a general analysis is conducted, focusing on criteria 1 and 3. The remaining criteria require a more in-depth analysis, which will be suggested to the pilots for their implementation.

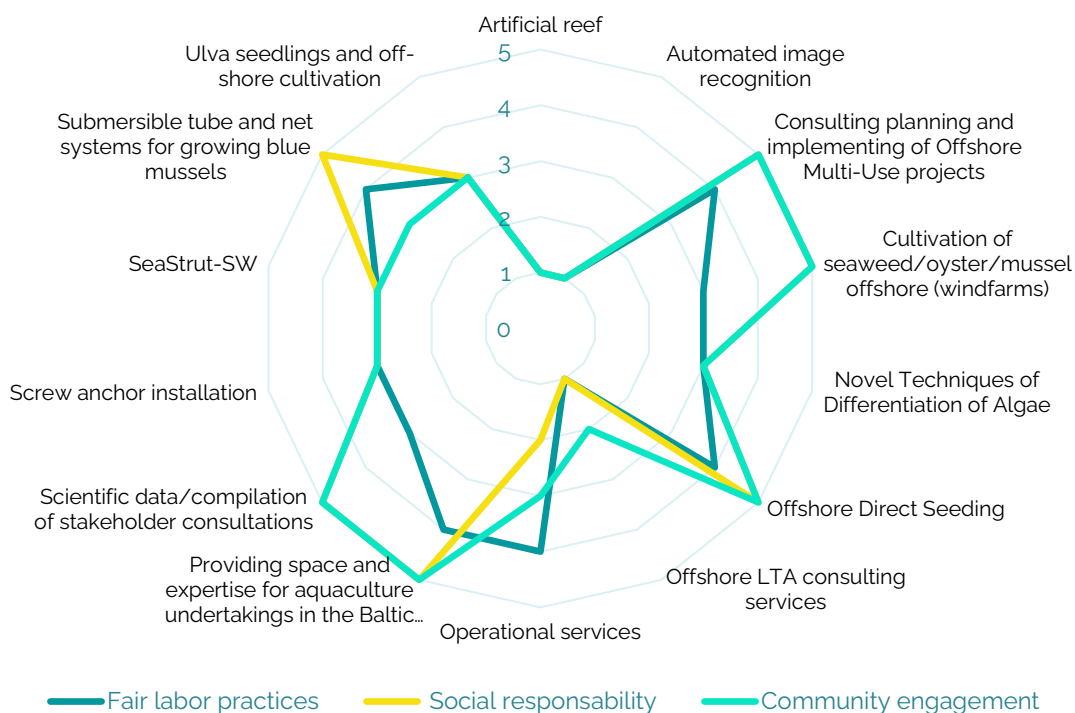
The minimum safeguards have been asked in the questionnaire. The results are represented in Figure 20. The visualization is divided into two panels. **Panel A** represents Fair labour practices, social responsibility and Community engagement. **Panel B** shows Human rights and Equality and non-discrimination topics.



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A



B

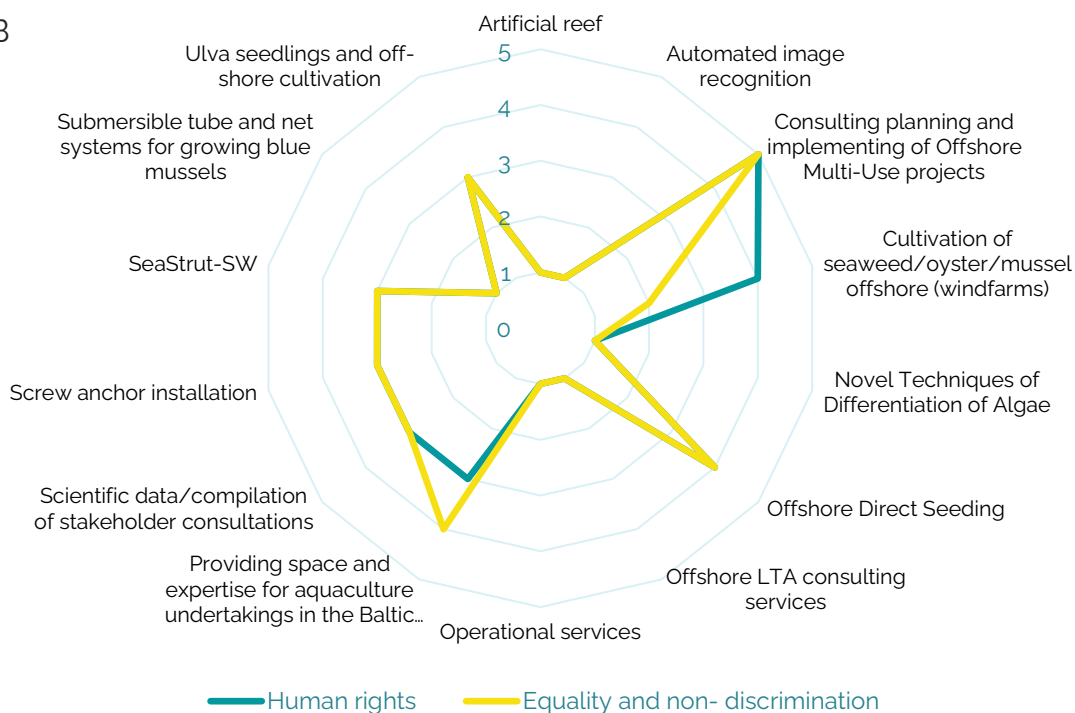


Figure 20. BMs Social Safeguards

Some of the BMs are not aligned (or not slightly aligned) with any of the social safeguard's topics, including: 'Artificial reef', 'Automated Image Recognition' or



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'Offshore LTA Consulting Services'. Some recommendations to reach the MSS to be aligned are:

1. Due diligence procedures: Develop and implement comprehensive due diligence procedures covering various issues such as human rights or fair competition.
2. Human rights impact assessment: Conduct comprehensive assessments to identify the potential human rights impacts of each BMs, with a particular focus on local communities and workers involved in its implementation.
3. Training and capacity building: Provide training programmes for employees and contractors involved in BMs activities to ensure understanding and compliance with minimum safeguards.

5.2 Theoretical EU Taxonomy example

To illustrate the complex process of testing the alignment of BMs with the EU Taxonomy, particularly in biological contexts, we present a theoretical example **"Seaweed, Mussel, and Oyster Offshore Farm in a Wind Energy Generation Area"**. This hypothetical scenario demonstrates how such alignment might be approached, **though it is not an actual application**. The theoretical objective would be to cultivate a comprehensive understanding and develop a speculative implementation strategy of the EU Taxonomy, focusing on the project's BMs. A conceptual guide has been created to elucidate the intricacies of the EU Taxonomy and propose how its application might be adapted to the specific biological contexts.

Example: Seaweed, Mussel, and Oyster Offshore Farm in a Wind Energy Generation Area

Activity Description

An offshore multi-use facility integrates **seaweed farming, bivalve aquaculture (mussels and oysters)**, and **wind energy generation** in a marine area. The facility is designed to:

- Enhance biodiversity by creating artificial habitats.
- Restore water quality through the filtration abilities of shellfish and nutrient uptake by seaweed.
- Support marine ecosystems while contributing to renewable energy production.

Substantial Contribution to EU Objectives



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1. Conservation and Restoration of Marine Habitats

- **Seaweed Farming:** Seaweed absorbs excess nutrients (e.g., nitrogen and phosphorus) from surrounding waters, mitigating eutrophication and restoring the water's ecological balance.
- **Mussels and Oysters:** Bivalves act as natural biofilters, improving water clarity and quality, which benefits nearby marine ecosystems.
- **Biodiversity:** The farm structures create artificial habitats, promoting the recovery of marine species such as fishes, crustaceans, and other invertebrates.

2. Support for Ecosystem Services

- **Carbon Sequestration:** Seaweed captures CO₂, contributing to a zero-emission process or capture depending on later uses.
- **Water Purification:** The filtration capacity of mussels and oysters reduces suspended particles and organic matter, improving marine water quality.
- **Habitat Enhancement:** The farm attracts marine life, restoring ecosystems degraded by overfishing or habitat loss.

3. Alignment with EU Biodiversity and Climate Goals

- **EU Biodiversity Strategy for 2030:** Supports marine biodiversity protection by restoring degraded marine areas and creating synergies with protected areas such as **Natura 2000** sites.
- **Climate Change Mitigation and Adaptation:** Complements wind energy generation, supporting low-carbon energy goals while reducing oceanic nutrient imbalances.

Technical Screening Criteria for EU Taxonomy Alignment

Substantial Contribution

- **Seaweed, mussels, and oysters:** The farm provides measurable ecosystem benefits, such as improved water quality (e.g., reduced nutrient concentrations) and biodiversity restoration (e.g., increased fish and invertebrate populations).
- **Marine co-location with wind farms:** Minimizes competition for marine space and maximizes synergies between renewable energy and sustainable aquaculture.

Do No Significant Harm (DNSH)



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- **Impact Assessments:** Regular monitoring ensures that farm structures do not negatively affect surrounding ecosystems, such as sensitive seafloor habitats or migratory routes.
- **Sustainable Practices:** Avoids overextraction of natural resources, uses biodegradable materials where possible, and ensures waste is managed effectively.
- **Compatibility with Wind Turbines:** The placement of aquaculture infrastructure ensures no interference with wind turbine operation or marine navigation.

Minimum Social Safeguards

- Promotes fair labour practices and supports local communities by creating employment opportunities in sustainable aquaculture and marine conservation.
- Engages stakeholders, including fishers and environmental groups, to ensure equitable use of marine resources.

Monitoring and Reporting

The farm employs key indicators to measure its contribution:

- **Water Quality Improvements:** Reduction in nitrogen, phosphorus, and suspended solids.
- **Biodiversity Metrics:** Increase in species richness and abundance around farm structures.
- **Carbon Impact:** Quantification of carbon sequestration by seaweed and reductions in eutrophication.

Relevance to Stakeholders

- **Investors:** Aligns with the EU Taxonomy, qualifying for green financing such as **sustainability-linked loans** or **blue bonds**.
- **Policymakers:** Demonstrates a scalable, multi-use marine model that supports the EU's renewable energy and biodiversity targets.
- **Local Communities:** Enhances sustainable livelihoods and promotes marine ecosystem health.

Figure 21 illustrates the previous example and is a way of understanding how the integration of **offshore aquaculture** with **renewable energy generation** contributes to both biodiversity restoration and climate mitigation, aligning with the EU Taxonomy's objectives.



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Total Turnover	Wind powered energy generation	50 %	Aligned, no threshold	DNHS noise, composite waste pollution, biodiversity risks for birds and baths	Minimum standards related to UNGP, OECD guidelines and ILO conventions	Taxonomy aligned, turnover 65%
	Conservation, including restoration of habitats, ecosystems and species	15 %	a.maintaining good condition of ecosystems, species, habitats or of habitats of species; b.re-establishing or restoring ecosystems, habitats or habitats of species towards or to good condition, including through increasing their area or range.	DNHS climate mitigation, climate adaptation, water, Pollution prevention		
	Engineering activities and related technical consultancy dedicated to adaptation to climate change	15 %	a.it uses state-of-the-art modelling techniques that: a. properly reflect climate change risks; b. do not rely only on historical trends; c. integrate forward-looking scenarios; b.it develops climate models and projections, services and assessment of impacts, the best available science for vulnerability and risk analysis and related methodologies line with the most recent Intergovernmental Panel on Climate Change reports and scientific peer-reviewed publications.	In case the company don't provide that information. The investor has to conduct Due to diligence, including screening against controversies		
			Substantial contribution	Do No Significant Harm	Minimum safeguards	

Figure 21. EU Taxonomy Alignment Example: Seaweed, Mussel, and Oyster Offshore Farm in a Wind Energy Generation Area.

On the European Commission's portal, there is an interactive tool called **EU Taxonomy Calculator**²⁸ (Figure 22). This tool is intended to assist users in their application of the information requirements set out in Delegated Regulation (EU) 2021/2178) under Article 8 of the **EU Taxonomy Regulation (Regulation (EU) 2020/852)**.

EU Taxonomy Calculator

[Selection](#)
[Your activities](#)
[Objectives](#)
[Substantial contribution](#)
[DNSH](#)
[Minimum safeguards](#)
[Overview](#)

Select the figures you want to look at

☐ Turnover
 ☐ Capex
 ☐ Opex

* mandatory field

> Next

Figure 22. EU Taxonomy Calculator Overview²⁹

The tool gives an example of the many procedures that enterprises would have to take to determine their Taxonomy-alignment and Taxonomy-eligibility, complete the Disclosures Delegated Act templates, and determine their Key Performance Indicators (KPIs). As the tool is intended for instructive purposes only, it shows the steps necessary only for non -financial undertakings.

The ULTFARMS project, by aligning with the EU Taxonomy, could bring several synergies and boost the attraction about sustainable investment, contribute to the EU's climate and energy objectives for 2030 and the European Green Deal.



6. Recommendations for additional benefits and opportunities based on ULTFARMS Business Model

In this section, some recommendations are included to improve the current BMs, aligning them more closely with SDGs, circularity and EU Taxonomy principles. These recommendations address key aspects such as how to attract investors, redesigning value chains, and exploring alternative financing mechanisms that facilitate the transition towards more responsible and resilient BMs. Some of the reasons for aligning the BMs are:

- **Attracting new investors:**
 - Responsible impact assessment for **sustainable investment**.
 - Investment decision making that **prioritises ESG** (Environmental, Social and Governance) criteria.
 - Targeted investors and **investment funds aligned with ULTFARMS sectors**.
- **Reputation and brand enhancement**
- **Process and product innovation:** operational efficiency and cost reduction

6.1 Recommendations and strategies to improve sustainability and maximize the funding opportunities

- The objective is to conduct a comprehensive mapping of the SDGs across BMs, developing specific, measurable objectives that directly contribute to the SDGs and creating KPIs to track progress and embed the SDGs into strategic planning.
- Establish collaborative innovation ecosystems with start-ups, research institutions, and academic partners and develop platforms for crowdsourcing sustainable innovations.
- Implement comprehensive sustainability training programs. Create incentive systems that reward sustainable innovations.
- It is essential to maintain a continuous monitoring of emerging environmental regulations. To anticipate future sustainability requirements, it is necessary to develop flexible strategies. Furthermore, it is crucial to invest in technologies that proactively exceed current environmental standards.
- Design products with modular components and extended lifecycles. Provide repair services and spare parts. Create design guidelines that prioritize product longevity and easy maintenance.
- It is recommended that supply chain audits be conducted to prioritise the use of recycled and renewable materials. Establish connections with



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suppliers who adhere to sustainable practices. Establish ambitious targets for the use of sustainable materials.

- It is recommended that a system of traceability and transparency be implemented to ensure accountability and transparency in the processes and origins of materials.
- It is recommended that the implementation of zero-waste processes be promoted and that waste-to-resource conversion opportunities be explored. Furthermore, it would be beneficial to set aggressive waste reduction targets.

6.2 Other financing/funding opportunities

To support technological development and stimulate research, development, and innovation (RDI) projects, additional financial resources are essential. This section is focused on European public and private funding opportunities, prioritizing comprehensive and strategic financing mechanisms. Current research has systematically mapped European funding channels, including framework program grants and specialized innovation funds. Regional financing schemes have been initially excluded due to their context-specific nature, requiring detailed analytical assessment. Once the final BMs have been obtained, the possibility of including other sources of funding outside Europe will be assessed, depending on the final market analysis and the potential of the project results.

Updated: December 2024

6.3 Public Funding

6.3.1 EIC ACCELERATOR

Funding entity: EASME - Executive Agency for SMEs

Description: The EIC Accelerator supports high-risk, high-potential small and medium-sized enterprises and innovators to help them develop and bring onto the market new innovative products, services and BMs that could drive economic growth.

Project Budget: € 0.5 and € 2.5 million. investments (direct equity investments) of up to €15 million managed by the EIC Fund for scale up and other relevant costs.

Beneficiaries: Small and medium-sized enterprises (SMES)

Length of the Project: From 12 to 24 months

Funding Approach: Grants

Call: Open

Website: https://eic.ec.europa.eu/eic-funding-opportunities/eic-accelerator_en



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6.3.2 EUROSTARS

Funding entity: National Eureka partner

Description: Eurostars is a funding instrument that supports innovative SMEs and project partners (large companies, universities, research organizations and other types of organizations) by funding international collaborative R&D and innovation projects. By participating, organizations from 37 countries can access public funding for international collaborative R&D projects in all fields.

Project Budget: If the applicants are from a Eurostars country, funding conditions available can be found in the country-specific webpages. Also, the corresponding national or regional funding body can be contacted. Organizations from non-Eurostars countries can participate by self-funding their project costs.

Beneficiaries: Small and medium-sized enterprises (SMES)

Length of the Project: The length of these projects may be from 12 to 36 months.

Funding Approach: The amount of Eurostars funding that might be received is managed by the corresponding national funding body. Funding rules vary from country to country and national funding bodies decide:

- which organisations can receive funding,
- which project activities can be funded, and
- funding rates and thresholds.

Call: Closed now

Website: <https://www.eurekanetwork.org/open-calls>

6.3.3 INNOWWIDE

Funding entity: European Partnership on Innovative SMEs.

Description: SMEs can develop product- (process- or service-) market combinations and partnerships with strategic counterparts to generate business opportunities and compete in new and emerging markets.

Project Budget: Maximum €60 000 lump sum per project

Beneficiaries: Small and medium-sized enterprises (SMES)

Length of the Project: Six-month project duration

Funding Approach: Grants

Call: Open call with cut off dates

Website: <https://www.eurekanetwork.org/programmes/innowwide>

6.3.4 CASCADE FUNDING

Funding entity: European Commission



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Description: Cascade funding, also known as Financial Support for Third Parties (FSTP), is a Commission mechanism to distribute public funding in order to assist beneficiaries, such as start-ups, scale-ups, SME and/or mid-caps, in the uptake or development of digital innovation.

Cascade funding is a European Commission mechanism that distributes smaller amounts of public funds in a more agile way, supporting specific topics such as the incorporation of new technologies, the promotion of start-ups and sector pioneers, etc.

The main objective of this funding method is to simplify administrative procedures for applicant entities, mostly SMEs and start-ups, thus allowing some EU-funded projects to issue, in turn, open calls for further funding. In other words, cascade funding is a simplified public funding opportunity, designed to facilitate a greater capillarity of EC funds and actions, facilitating the participation of SMEs and start-ups, since for them, participating in a European project means dealing with a large amount of bureaucracy.

Project Budget: €50.000 to €150.000

Beneficiaries: SMEs and start-ups

Length of the Project: Variable

Funding Approach: Grants

Call: Several cut off dates

Website: <https://ec.europa.eu/info/fundingtenders/opportunities/portal/screen/opportunities/competitive-calls>

6.3.5 EUROCLUSTER CASCADE FUNDING

Funding entity: European Innovation Council and SMEs Executive Agency (EISMEA)

Description: [Euroclusters](#) are cross-sectoral, interdisciplinary, and trans-European strategic initiatives gathering industry clusters and other economic actors, such as research organisations, companies, etc. to implement the EU Industrial Strategy. They will create new business opportunities for SMEs and integrate them better in European and global strategic value chains.

The Euroclusters build upon European Commission's experience with the 4 strands of "[European Cluster Partnerships](#)", supported under Horizon 2020 (Innovation) and COSME (Internationalization, Excellence and Smart Specialization Investments).

Project Budget: €50.000 to €150.000

Beneficiaries: SMEs and start-ups

Length of the Project: Variable

Funding Approach: Grants



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Call: Several cut off dates

Website: https://eisma.ec.europa.eu/news/euroclusters-are-launching-their-first-cascade-funding-calls-2023-03-29_en



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7. Conclusions

This document provides a first analysis of the sustainability and circularity of the preliminary BMs of the ULTFARMS project, created from the first list of KERs collected by the partners, as a first result of Task 7.3 and the WP5 Tasks.

The ULTFARMS BMs demonstrate alignment with multiple SDGs, including **SDG 9 (Industry, Innovation, and Infrastructure)**, **SDG 12 (Responsible Consumption and Production)**, **SDG 13 (Climate Action)**, and **SDG 14 (Life Below Water)**. ULTFARMS contributes to sustainable aquaculture, ecosystem restoration, and the broader blue economy. As these models scale, they are poised to impact national and regional sustainability goals significantly.

In terms of **SDG 9**, ULTFARMS drives industrial innovation through the production of cutting-edge aquaculture systems like submersible nets, artificial reefs, and advanced monitoring tools. This aligns with targets related to inclusive and sustainable industrialization, fostering small-scale industries, and enhancing R&D intensity. Therefore, it is expected to increase manufacturing added value and employment, providing economic benefits to local communities.

The focus on sustainable production aligns strongly with **SDG 12**, promoting efficient resource use (Target 12.2) and raising awareness about sustainable practices (Target 12.8). ULTFARMS' consultancy services play a role in educating stakeholders and fostering responsible consumption.

By integrating remote management systems and predictive tools, ULTFARMS contributes to **SDG 13** through reduced greenhouse gas emissions (Target 13.2) and enhanced climate resilience (Target 13.3). Automation minimizes travel and supports decision-making under changing environmental conditions, reducing the carbon footprint of aquaculture operations.

Finally, **SDG 14** sees the most direct impact, as mussels and seaweed farming enhance biodiversity, improve water quality, and restore marine ecosystems. By driving habitat construction and nutrient cycling, ULTFARMS contributes to sustainable ocean ecosystems and marine resource management.

Regarding to the EU Taxonomy environmental objectives, the integration LTA systems within offshore wind farms represents an alternative of sustainable food production and clean energy generation, addressing critical challenges in marine resource management and climate change mitigation.

With this holistic approach, the project pursues three main environmental objectives of the EU Taxonomy: **climate change mitigation, sustainable use of**



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marine resources and the transition to a circular economy. By establishing six pilot in offshore wind farms in the North Sea and the Baltic Sea, ULTFARMS aims to optimise the production of marine species while minimising environmental impact.

An analysis of the project's BMs was conducted to determine their alignment with the standards set by the EU Taxonomy. The data collected through the questionnaire included in Appendix 3 shows that the preliminary BMs have strong correlations with the objectives of **"Use of Natural Resources"** and **"Biodiversity Conservation"**. However, the BMs show more diverse alignments with climate change related objectives. It is noteworthy that about 50% of the BMs contribute to at least four environmental objectives.

The social sustainability dimension of the BMs adds another layer of complexity. While **"Community engagement"** and **"Social responsibility"** are relatively well addressed, significant gaps remain in the areas of human rights and non-discrimination. To improve compliance, some of the BMs should implement measures to better analyse the social safeguards to be considered, some of which are suggested below: comprehensive due diligence procedures, conducting thorough human rights impact assessments, and developing robust training programmes to ensure minimum standards of social protection. However, the non-alignment social sustainability dimension such as human rights appears to stem from the perception of these issues as inherently obvious for the partners. This approach suggests that certain human rights considerations have been treated as self-evident, potentially leading to a superficial assessment of alignment in the questionnaire. This approach will be nuanced and taken into account in the WP5 BMs.

In order to fully comply with the requirements, set out in the EU Taxonomy, the project should ensure that the BMs developed in the ULTFARMS project make a substantial contribution to **environmental objectives**, that they **prevent significant harm to other ecological goals**, that verify the **minimum social safeguards**, and that meet the specific **Technical Screening Criteria**. By maintaining this rigorous and holistic perspective, ULTFARMS can serve as a model for sustainable, multi-use marine resource development, demonstrating how innovative technological solutions can be combined with environmental stewardship.

In conclusion, the ULTFARMS project demonstrates the transformative potential of innovative and sustainable solutions, by strategically integrating economic development and environmental protection. If scaled up, these approaches have the potential to make significant contributions to both national and global



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sustainability goals, closely aligned with the European Union's circularity principles and EU Taxonomy for sustainable economic activities.



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Appendix 1. SDGs targets and indicators



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Targets	Indicators	UNSD Indicator Codes
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$2.15 a day	1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	C010101
1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1 Proportion of population living below the national poverty line, by sex and age	C010201
	1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	C010202
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	C010301
1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1 Proportion of population living in households with access to basic services	C010401
	1.4.2 Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by sex and type of tenure	C010402
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	C200303
	1.5.2 Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)	C010502
	1.5.3 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030	C200304
	1.5.4 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	C200305
1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable	1.a.1 Total official development assistance grants from all donors that focus on poverty reduction as a share of the recipient country's gross national income	C010a04



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means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	1.a.2 Proportion of total government spending on essential services (education, health and social protection)	C010a02
1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1 Pro-poor public social spending	C010b02
2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	2.1.1 Prevalence of undernourishment	C020101
	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	C020102
2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age	C020201
	2.2.2 Prevalence of malnutrition (weight for height $>+2$ or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)	C020202
	2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	C020203
2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size	C020301
	2.3.2 Average income of small-scale food producers, by sex and indigenous status	C020302
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	C020401



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2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities	C020501
	2.5.2 Proportion of local breeds classified as being at risk of extinction	C020503
2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	2.a.1 The agriculture orientation index for government expenditures	C020a01
	2.a.2 Total official flows (official development assistance plus other official flows) to the agriculture sector	C020a02
2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round	2.b.1 Agricultural export subsidies	C020b02
2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	2.c.1 Indicator of food price anomalies	C020c01
3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	3.1.1 Maternal mortality ratio	C030101
	3.1.2 Proportion of births attended by skilled health personnel	C030102
3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	3.2.1 Under-5 mortality rate	C030201
	3.2.2 Neonatal mortality rate	C030202
3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	C030301
	3.3.2 Tuberculosis incidence per 100,000 population	C030302



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	3.3.3 Malaria incidence per 1,000 population	C030303
	3.3.4 Hepatitis B incidence per 100,000 population	C030304
	3.3.5 Number of people requiring interventions against neglected tropical diseases	C030305
3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	C030401
	3.4.2 Suicide mortality rate	C030402
3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders	C030501
	3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	C030502
3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	3.6.1 Death rate due to road traffic injuries	C030601
3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	3.7.1 Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods	C030701
	3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	C030702
3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	3.8.1 Coverage of essential health services	C030801
	3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income	C030802
3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution	C030901
	3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	C030902
	3.9.3 Mortality rate attributed to unintentional poisoning	C030903
3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	3.a.1 Age-standardized prevalence of current tobacco use among persons aged 15 years and older	C030a01
3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in	3.b.1 Proportion of the target population covered by all vaccines included in their national programme	C030b01
	3.b.2 Total net official development assistance to medical research and basic health sectors	C030b02



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accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	3.b.3 Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis	C030b03
3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	3.c.1 Health worker density and distribution	C030c01
3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks	3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness	C030d01
	3.d.2 Percentage of bloodstream infections due to selected antimicrobial-resistant organisms [n 6]	C030d02
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	C040101
	4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	C040102
4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	4.2.1 Proportion of children aged 24–59 months who are developmentally on track in health, learning and psychosocial well-being, by sex [n 8]	C040201
	4.2.2 Participation rate in organized learning (one year before the official primary entry age), by sex	C040202
4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	C040301
4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	C040401
4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational	4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-	C040501



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training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	affected, as data become available) for all education indicators on this list that can be disaggregated	
4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy	4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex	C040601
4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	C200306
4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	4.a.1 Proportion of schools offering basic services, by type of service	C040a01
4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries	4.b.1 Volume of official development assistance flows for scholarships by sector and type of study	C040b01
4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	4.c.1 Proportion of teachers with the minimum required qualifications, by education level[n g]	C040c01
5.1 End all forms of discrimination against all women and girls everywhere	5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex	C050101
5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	5.2.1 Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age	C050201



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	5.2.2 Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence	C050202
5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation	5.3.1 Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18	C050301
	5.3.2 Proportion of girls and women aged 15–49 years who have undergone female genital mutilation/cutting, by age	C050302
5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	C050401
5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	C050501
	5.5.2 Proportion of women in managerial positions	C050502
5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	5.6.1 Proportion of women aged 15–49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care	C050601
	5.6.2 Number of countries with laws and regulations that guarantee full and equal access to women and men aged 15 years and older to sexual and reproductive health care, information and education	C050602
5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	C050a01
	5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control	C050a02
5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	5.b.1 Proportion of individuals who own a mobile telephone, by sex	C050b01
5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment	C050c01



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6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services	C060101
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand washing facility with soap and water	C060201
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of domestic and industrial wastewater flows safely treated	C060303
	6.3.2 Proportion of bodies of water with good ambient water quality	C060302
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 Change in water-use efficiency over time	C060401
	6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	C060402
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management	C060501
	6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	C060502
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	C060601
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	C060a01
6.b Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	C060b01
	7.1.1 Proportion of population with access to electricity	C070101



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7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.2 Proportion of population with primary reliance on clean fuels and technology	C070102
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	C070201
7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP	C070301
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	7.a.1 International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	C070a01
7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	7.b.1 Installed renewable energy-generating capacity in developing countries (in watts per capita)	C200208
8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	8.1.1 Annual growth rate of real GDP per capita	C080101
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	8.2.1 Annual growth rate of real GDP per employed person	C080201
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	8.3.1 Proportion of informal employment in total employment, by sector and sex	C080302
8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP	C200202



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decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	C200203
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities	Co80501
	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Co80502
8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	8.6.1 Proportion of youth (aged 15–24 years) not in education, employment or training	Co80601
8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	8.7.1 Proportion and number of children aged 5–17 years engaged in child labour, by sex and age	Co80701
8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	8.8.1 Fatal and non-fatal occupational injuries per 100,000 workers, by sex and migrant status	Co80801
	8.8.2 Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status	Co80802
8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate	Co80901
8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	8.10.1 (a) Number of commercial bank branches per 100,000 adults and (b) number of automated teller machines (ATMs) per 100,000 adults	Co81001
	8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider	Co81002
8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries	8.a.1 Aid for Trade commitments and disbursements	Co80a01



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8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization	8.b.1 Existence of a developed and operationalized national strategy for youth employment, as a distinct strategy or as part of a national employment strategy	C080b01
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road	C090101
	9.1.2 Passenger and freight volumes, by mode of transport	C090102
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	9.2.1 Manufacturing value added as a proportion of GDP and per capita	C090201
	9.2.2 Manufacturing employment as a proportion of total employment	C090202
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	9.3.1 Proportion of small-scale industries in total industry value added	C090301
	9.3.2 Proportion of small-scale industries with a loan or line of credit	C090302
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO2 emission per unit of value added	C090401
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	9.5.1 Research and development expenditure as a proportion of GDP	C090501
	9.5.2 Researchers (in full-time equivalent) per million inhabitants	C090502
9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure	C090a01



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9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	9.b.1 Proportion of medium and high-tech industry value added in total value added	C090b01
9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020	9.c.1 Proportion of population covered by a mobile network, by technology	C090c01
10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population	C100101
10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	10.2.1 Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities	C100201
10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	10.3.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law	C200204
10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	10.4.1 Labour share of GDP	C100401
	10.4.2 Redistributive impact of fiscal policy[ln 16]	C100402
10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	10.5.1 Financial Soundness Indicators	C100501
10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	10.6.1 Proportion of members and voting rights of developing countries in international organizations	C200205
10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	10.7.1 Recruitment cost borne by employee as a proportion of monthly income earned in country of destination	C100701
	10.7.2 Number of countries with migration policies that facilitate orderly, safe, regular and responsible migration and mobility of people	C100702



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	10.7.3 Number of people who died or disappeared in the process of migration towards an international destination ^[17]	C100703
	10.7.4 Proportion of the population who are refugees, by country of origin	C100704
10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements	10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	C100a01
10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes	10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	C100b01
10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	10.c.1 Remittance costs as a proportion of the amount remitted	C100c01
11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	C110101
11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	C110201
11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate	C110301
	11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically	C110302
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total per capita expenditure on the preservation, protection and conservation of all cultural and natural heritage, by source of funding (public, private), type of heritage (cultural, natural) and level of government (national, regional, and local/municipal)	C110401
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease	11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	C200303



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the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters	C110502
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities	C110603
	11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	C110602
11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	C110701
	11.7.2 Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months	C110702
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Number of countries that have national urban policies or regional development plans that (a) respond to population dynamics; (b) ensure balanced territorial development; and (c) increase local fiscal space	C110a02
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels	11.b.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030	C200304
	11.b.2 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	C200305
11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials	
12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	12.1.1 Number of countries developing, adopting or implementing policy instruments aimed at supporting the shift to sustainable consumption and production	C200101
12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP	C200202



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	12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	C200203
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	12.3.1 (a) Food loss index and (b) food waste index	C120301
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement	C120401
	12.4.2 (a) Hazardous waste generated per capita; and (b) proportion of hazardous waste treated, by type of treatment	C120402
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.5.1 National recycling rate, tons of material recycled	C120501
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	12.6.1 Number of companies publishing sustainability reports	C120601
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	12.7.1 Degree of sustainable public procurement policies and action plan implementation	C120701
12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	C200306
12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	12.a.1 Installed renewable energy-generating capacity in developing countries (in watts per capita)	C200208
12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	12.b.1 Implementation of standard accounting tools to monitor the economic and environmental aspects of tourism sustainability	C120b02
12.c Rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and	12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	C120c01



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conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities		
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	C200303
	13.1.2 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030	C200304
	13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	C200305
13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans, strategies as reported in adaptation communications and national communications	C130203
	13.2.2 Total greenhouse gas emissions per year	C130202
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	C200306
13.a Implement the commitment undertaken by developed-country parties to the UN Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	13.a.1 Amounts provided and mobilized in United States dollars per year in relation to the continued existing collective mobilization goal of the \$100 billion commitment through to 2025	C130a02
13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	13.b.1 Number of least developed countries and small island developing States with nationally determined contributions, long-term strategies, national adaptation plans, strategies as reported in adaptation communications and national communications	C130b02



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14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density[n 24]	C140101
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Number of countries using ecosystem-based approaches to managing marine areas	C140201
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	C140301
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels	C140401
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas	C140501
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation ⁴	14.6.1 Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	C140601
14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through	14.7.1 Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	C140701



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sustainable management of fisheries, aquaculture and tourism		
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	C140a01
14.b Provide access for small-scale artisanal fishers to marine resources and markets	14.b.1 Degree of application of a legal/regulatory/ policy/institutional framework which recognizes and protects access rights for small-scale fisheries	C140b01
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the UN Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the UN Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	C140c01
15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area	C150101
	15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	C150102
15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management	C150201
15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area	C150301



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15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity	C150401
	15.4.2 Mountain Green Cover Index	C150402
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1 Red List Index	C150501
15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed	15.6.1 Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits	C150601
15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	15.7.1 Proportion of traded wildlife that was poached or illicitly trafficked	C200206
15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	C150801
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 (a) Number of countries that have established national targets in accordance with or similar to Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020 in their national biodiversity strategy and action plans and the progress reported towards these targets; and (b) integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting	C150902
15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.a.1 (a) Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments	C200210
15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	15.b.1 (a) Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments	C200210



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15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked	C200206
16.1 Significantly reduce all forms of violence and related death rates everywhere	16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age	C160101
	16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause	C160102
	16.1.3 Proportion of population subjected to (a) physical violence, (b) psychological violence and (c) sexual violence in the previous 12 months	C160103
	16.1.4 Proportion of population that feel safe walking alone around the area they live	C160104
16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	16.2.1 Proportion of children aged 1–17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month	C160201
	16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation	C160202
	16.2.3 Proportion of young women and men aged 18–29 years who experienced sexual violence by age 18	C160203
16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all	16.3.1 Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms	C160301
	16.3.2 Unsentenced detainees as a proportion of overall prison population	C160302
	16.3.3 Proportion of the population who have experienced a dispute in the past two years and who accessed a formal or informal dispute resolution mechanism, by type of mechanism	C160303
16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	16.4.1 Total value of inward and outward illicit financial flows (in current United States dollars)	C160401
	16.4.2 Proportion of seized, found or surrendered arms whose illicit origin or context has been traced or established by a competent authority in line with international instruments	C160402



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16.5 Substantially reduce corruption and bribery in all their forms	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months	C160501
	16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months	C160502
16.6 Develop effective, accountable and transparent institutions at all levels	16.6.1 Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)	C160601
	16.6.2 Proportion of population satisfied with their last experience of public services	C160602
16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels	16.7.1 Proportions of positions in national and local institutions, including (a) the legislatures; (b) the public service; and (c) the judiciary, compared to national distributions, by sex, age, persons with disabilities and population groups	C160701
	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group	C160702
16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance	16.8.1 Proportion of members and voting rights of developing countries in international organizations	C200205
16.9 By 2030, provide legal identity for all, including birth registration	16.9.1 Proportion of children under 5 years of age whose births have been registered with a civil authority, by age	C160901
16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements	16.10.1 Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months	C161001
	16.10.2 Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information	C161002
16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime	16.a.1 Existence of independent national human rights institutions in compliance with the Paris Principles	C160a01
16.b Promote and enforce non-discriminatory laws and policies for sustainable development	16.b.1 Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law	C200204



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Finance		
17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection	17.1.1 Total government revenue as a proportion of GDP, by source	C170101
	17.1.2 Proportion of domestic budget funded by domestic taxes collection	C170102
17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries	17.2.1 Net official development assistance, total and to least developed countries, as a proportion of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee donors' gross national income (GNI)	C170201
17.3 Mobilize additional financial resources for developing countries from multiple sources	17.3.1 Foreign direct investment, official development assistance and South-South cooperation as a proportion of gross national income	C170303
	17.3.2 Volume of remittances (in United States dollars) as a proportion of total GDP	C170302
17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress	17.4.1 Debt service as a proportion of exports of goods and services	C170401
17.5 Adopt and implement investment promotion regimes for least developed countries	17.5.1 Number of countries that adopt and implement investment promotion regimes for developing countries, including the least developed countries	C170502
Technology		
17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in	17.6.1 Fixed Internet broadband subscriptions per 100 inhabitants, by speed[^{n 28}]	C170602



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particular at the UN level, and through a global technology facilitation mechanism		
17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	17.7.1 Total amount of funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies	C170701
17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology	17.8.1 Proportion of individuals using the Internet	C170801
Capacity-building		
17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the SDGs, including through north-south, South-South and triangular cooperation	17.9.1 Dollar value of financial and technical assistance (including through north-south, South-South and triangular cooperation) committed to developing countries	C170901
Trade		
17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda	17.10.1 Worldwide weighted tariff-average	C171001
17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020	17.11.1 Developing countries' and least developed countries' share of global exports	C171101
17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access	17.12.1 Weighted average tariffs faced by developing countries, least developed countries and small island developing States	C171201
Systemic issues		



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Policy and institutional coherence		
17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence	17.13.1 Macroeconomic Dashboard	C171301
17.14 Enhance policy coherence for sustainable development	17.14.1 Number of countries with mechanisms in place to enhance policy coherence of sustainable development	C171401
17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development	17.15.1 Extent of use of country-owned results frameworks and planning tools by providers of development cooperation	C171501
Multi-stakeholder partnerships		
17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the SDGs in all countries, in particular developing countries	17.16.1 Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the SDGs	C171601
17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	17.17.1 Amount in United States dollars committed to public-private partnerships for infrastructure	C171702
Data, monitoring and accountability		
17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts	17.18.1 Statistical capacity indicator for Sustainable Development Goal monitoring	C171804
	17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics	C171802
	17.18.3 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding	C171803
17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries	17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries	C171901
	17.19.2 Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration	C171902
2 The Gini Coefficient will be reported as a second series in the database, as it is a component of this indicator.	2 The Gini Coefficient will be reported as a second series in the database, as it is a component of this indicator.	



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Appendix 2: Substantial Contribution to Climate Change Mitigation



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NACE Activity	1. Climate change mitigation (Substantial Contribution)			2. Climate change adaptation (DNSH)	3. Water (DNSH)	4. Circular economy (DNSH)	5. Pollution (DNSH)	6. Ecosystems (DNSH)
	Own performance	Enabling activities	Transitional activities					
Afforestation	X			X	X		X	X
Rehabilitation, Reforestation	X			X	X		X	X
Reforestation	X			X	X		X	X
Existing forest management	X			X	X		X	X
Conservation forest	X			X	X		X	X
Growing of perennial crops	X		X	X	X	X	X	X
Growing of non-perennial crops	X		X	X	X	X	X	X
Livestock production	X		X	X	X	X	X	X
Manufacture of low carbon technologies		X		X	X	X	X	X
Manufacture of Cement	X		X	X	X	X	X	X



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Manufacture of Aluminium	X		X	X	X	X	X	X
Manufacture of Iron and Steel	X		X	X	X	X	X	X
Manufacture of Hydrogen	X			X	X	X	X	X
Manufacture of other inorganic basic chemicals - Manufacture of carbon black	X		X	X	X	X	X	X
Manufacture of other inorganic basic chemicals - Manufacture of disodium carbonate (soda ash)	X		X	X	X	X	X	X
Manufacture of other inorganic basic chemicals - Manufacture of chlorine	X			X	X	X	X	X
Manufacture of other organic basic chemicals	X			X	X	X	X	X
Manufacture of fertilizers and	X			X	X	X	X	X



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nitrogen compounds								
Manufacture of plastics in primary form	X			X	X	X	X	X
Production of Electricity from Solar PV	X			X		X		X
Production of Electricity from Concentrated Solar Power	X			X	X	X		X
Production of Electricity from Wind Power	X			X	X	X		X
Production of Electricity from Ocean Energy	X			X		X	X	X
Production of Electricity from Hydropower	X			X	X		X	X
Production of Electricity from Geothermal	X			X	X		X	X
Production of Electricity from Gas (not exclusive to natural gas)	X			X	X		X	X



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Production of Electricity from Bioenergy (Biomass, Biogas and Biofuels)	X			X	X	X	X	X
Transmission and Distribution of Electricity	X	X		X	X	X	X	X
Storage of Electricity		X		X		X		X
Storage of Thermal Energy		X		X		X		X
Storage of Hydrogen		X		X		X		X
Manufacture of Biogas or Biofuels	X			X	X	X	X	X
Retrofit of Gas Transmission and Distribution Networks	X			X	X	X	X	X
District Heating/ Cooling Distribution	X			X	X		X	X
Installation and operation of Electric Heat Pumps	X			X	X			
Cogeneration of Heat/cool and	X			X	X	X		X



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Power from Con-centrated Solar Power								
Cogeneration of Heat/Cool and Power from Geo-thermal Energy	X			X	X		X	X
Cogeneration of Heat/Cool and Power from Gas (not exclusive to natural gas)	X			X	X		X	X
Cogeneration of Heat/Cool and Power from Bioen-ergy (Biomass, Biogas, Biofuels)	X			X	X	X	X	X
Production of Heat/cool from Concentrated Solar Power	X			X	X	X		X
Production of Heat/cool from Geothermal	X			X	X		X	X
Production of Heat/Cool from Gas (not exclusive to natural gas)	X			X	X		X	X
Production of Heat/cool from Bioenergy (Bi-omass, Biogas, Biofuels)	X			X	X	X	X	X



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Production of Heat/cool using Waste Heat	X			X		X	X	X
Water collection, treatment and supply	X			X	X			X
Centralized waste-water treatment	X			X			X	X
Anaerobic Digestion of Sewage sludge	X			X			X	
Separate collection and transport of non-hazardous waste in source segregated fractions	X			X		X	X	
Anaerobic digestion of bio-waste	X			X			X	
Composting of bio-waste	X			X			X	
Material recovery from non-hazardous waste	X			X				
Landfill gas capture and utilization	X			X			X	
Direct Air Capture of CO ₂		X		X	X		X	X
Capture of anthropogenic emissions		X		X	X	X	X	X
Transport of CO ₂		X		X	X		X	X



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Permanent Sequestration of captured CO2	X			X	X		X	X
Passenger Rail Transport (Inter- urban)	X			X		X	X	
Freight Rail Transport	X			X		X	X	
Public transport	X			X		X	X	
Infrastructure for low carbon transport (land transport)		X		X	X	X	X	X
Passenger cars and commercial vehicles	X			X		X	X	
Freight transport services by road	X			X		X	X	
Interurban scheduled road transport	X			X		X	X	
Inland passenger water transport	X			X	X	X	X	X
Inland freight water transport	X			X	X	X	X	X
Infrastructure for low carbon		X		X	X	X	X	X



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transport (water transport)								
Construction of new buildings	X			X	X	X	X	X
Building renovation	X			X	X	X	X	X
Individual renovation measures, installation of renewables on-site and professional, scientific and technical activities	X			X			X	
Acquisition and ownership of buildings	X			X			X	X
Data processing, hosting and related activities	X			X		X	X	
Data-driven climate change monitoring solutions		X		X				



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Appendix 3. ULTFARMS BMs' Contribution to Sustainability



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1. Which is the name of the organization who is filling this survey
2. Name of your KER or Business Model
3. What is the main objective of the business model described?
4. What are the key products or services offered by the business model?
 - Sensors
 - Structures
 - Software
 - Biomass production from mussels, oysters or seaweed
 - Consultancy services
5. Who are the target customers or users of the business model?
 - Producer
 - Manufacturer
 - Public Authorities
 - Professionals from the sector
 - R&D community
 - Consultancy
 - Consumers
 - Other

Sustainability Aspects

6. What are the current social, economic, and environmental sustainability aspects of the business model?
7. How does the business model contribute to the transition to a circular economy?

1 2 3 4 5

8. Are there any specific measures implemented to reduce waste and increase recycling?
 - Yes
 - No



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9. Are sustainable production and consumption practices integrated into the business model?
- ☐ Yes
 - ☐ No
10. Are there any products or services that promote sustainable lifestyles?
- ☐ Yes
 - ☐ No
11. Are there any products or services that promote sustainable lifestyles?

Alignment with EU Taxonomy

The EU Taxonomy allows financial and non-financial companies to share a common definition of economic activities that can be considered environmentally sustainable. The EU Taxonomy is a cornerstone of the EU's sustainable finance

framework and an important market transparency tool. It helps direct investments to the economic activities most needed for the transition, in line with the European Green Deal objectives. The Taxonomy is a classification system that defines criteria for economic activities that are aligned with a net zero trajectory by 2050 and the broader environmental goals other than climate. If more information is needed, visit the website

https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-Taxonomy-sustainable-activities_en

12. On a scale of 1 to 5, how well does the business model align with the EU Taxonomy criteria for environmental and social sustainability? (1 being not aligned at all, 5 being fully aligned)

1 2 3 4 5

13. How is the KERS (or BMs) contributing to environmental sustainability on a scale from 1 to 5 in the following topics

1 2 3 4 5

- ☐ Climate change mitigation
- ☐ Climate change adaptation
- ☐ Use of natural resources



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1 2 3 4 5

- Pollution prevention and control
 - Waste reduction and management
 - Biodiversity conservation
14. How is the KERS (or BMs) contributing to social sustainability on a scale from 1 to 5 in the following topics

Alignment with R&I Funding streams

15. On a scale of 1 to 5, how well does the business model align with the R&I funding streams for sustainable innovation? (1 being not aligned at all, 5 being fully aligned). To select all that apply.

1 2 3 4 5

- Fair labour practices
- Social responsibility
- Community engagement
- Human rights
- Equality and non- discrimination

1 2 3 4 5

- Climate change mitigation and adaptation
- Circular economy and resource efficiency
- Sustainable production and consumption
- Sustainable infrastructure and urban planning
- Sustainable agriculture and forestry
- Sustainable water management
- Sustainable energy transport
- Sustainable waste management
- Sustainable biodiversity and ecosystem services



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Alignment with European SDGs

The 2030 Agenda for Sustainable Development, adopted by all United Nations members in 2015, created 17 world Sustainable Development Goals (SDGs). The SDGs highlight the connections between the environmental, social and economic aspects of sustainable development. Sustainability is at the center of the SDGs. In case you do not know them, there is more information on <https://sdgs.un.org/es/goals>

16. On a scale of 1 to 5, how well does the business model align with the following SDGs? (1 being not aligned at all, 5 being fully aligned). To select all that apply.

1 2 3 4 5

- ☐ No poverty (SDG 1)
- ☐ Zero hunger (SDG 2)
- ☐ Good health and well-being (SDG 3)
- ☐ Quality education (SDG 4)
- ☐ Gender equality (SDG 5)
- ☐ Clean water and sanitation (SDG 6)
- ☐ Affordable and clean energy (SDG 7)
- ☐ Decent work and economic growth (SDG 8)
- ☐ Industry, innovation and infrastructure (SDG 9)
- ☐ Reduced inequalities (SDG 10)
- ☐ Sustainable cities and communities (SDG 11)
- ☐ Responsible consumption and production (SDG 12)
- ☐ Climate action (SDG 13)
- ☐ Life below water (SDG 14)
- ☐ Life on land (SDG 15)
- ☐ Peace, justice, and strong institutions (SDG 16)
- ☐ Partnerships for the goals (SDG 17)



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Additional Questions

17. Are there any specific challenges or barriers to implementing sustainable practices in the business model?
18. Are there any opportunities for collaboration or partnerships to enhance sustainability aspects?
19. Are there any plans for continuous monitoring and evaluation of sustainability performance



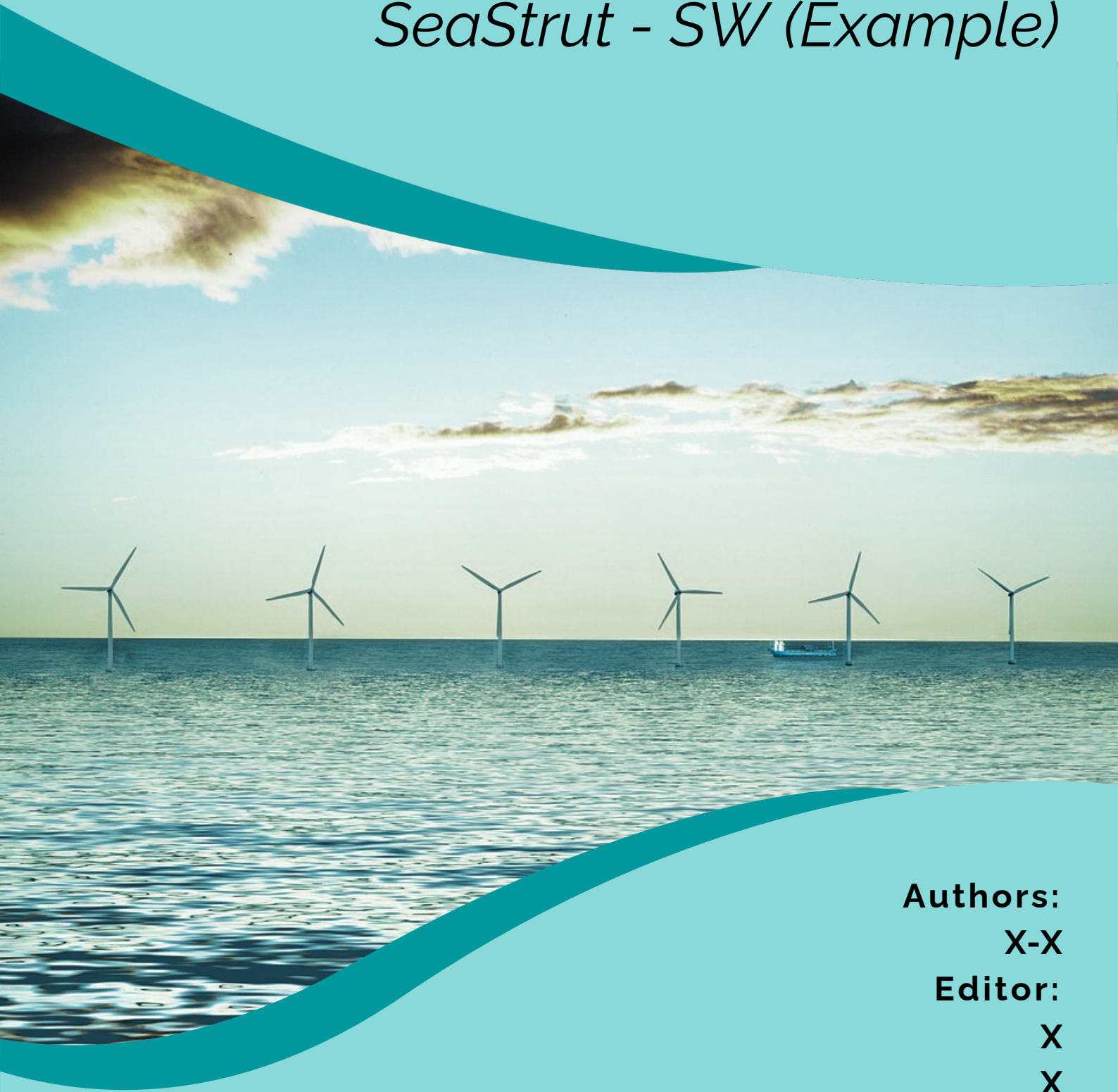
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Appendix 4. Business Brief

D7.3. BUSINESS BRIEFS

SeaStrut - SW (Example)



Authors:

X-X

Editor:

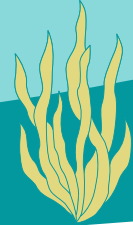
X

X



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EXECUTIVE SUMMARY

SeaStrut-SW is an advanced flotation support system designed for offshore aquaculture, specifically seaweed and shellfish farming. Leveraging Impact-9's proprietary variable buoyancy technology and inflatable beam systems, SeaStrut-SW enhances marine area utilization, ensures stability in dynamic ocean conditions, and reduces operational costs. SeaStrut-SW is under testing, showcasing its potential for scalable and sustainable integration in offshore environments. This innovative solution addresses growing market demands for low-trophic aquaculture and offers a modular building block for broader marine applications aquaculture.

PRODUCT OBJECTIVE & INNOVATION

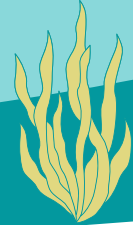
The objective of SeaStrut-SW is to deliver reliable, scalable, and adaptable buoyancy support systems for offshore aquaculture farms, solving industry challenges through:

- **Better Marine Area Utilization:** Stabilization and separation of substrates (e.g., nets, drop-rope, seaweed).
- **Autonomous Buoyancy Control:** Adjustments to counter wave loads, biomass growth, or storm impact.
- **Versatile Usability:** Applicable for finfish, shellfish, seaweed, and algae production.
- **Reduced Operational Risk:** Enhanced load attenuation and storm protection to safeguard farm structures.
- **Advanced Engineering:** Modular design enabling predictable outcomes, reduced visual impact, and optimized performance in exposed offshore sites

CORE SOLUTION

SeaStrut-SW integrates inflatable, pressure-supported beams with variable buoyancy control to offer:

- **Structural Stability:** For dynamic offshore environments.
- **Operational Efficiency:** Reducing the labour required for float management.
- **Scalability:** Modular configurations for diverse farming needs.
- **Enhanced Reliability:** Engineered with safe overload responses and continuous R&D improvements. SeaStrut-SW's collapsible beam design ensures compression resistance and ease of deployment while facilitating marine aquaculture's broader adoption.



MARKET OPPORTUNITY

The global seaweed market is projected to grow to \$11.8 billion by 2030, driven by rising demand for sustainable food sources, bio-based products, and carbon sequestration solutions (World Bank), specially in North America and Europe. Offshore seaweed farming represents a high-growth segment within this market due to increasing interest in ocean-based biomass production. SeaStrut-SW addresses key industry bottleneck points, such as scalability, operational costs, and adaptability, making it a vital component for the expansion of offshore aquaculture.

Belgium is a leader in offshore wind energy, with a well-established infrastructure in the North Sea. The Belwind offshore wind farm, where SeaStrut-SW is being tested, exemplifies the country's commitment to renewable energy. Offshore wind capacity in Belgium is expected to grow further, driven by policy commitments and advanced infrastructure, creating synergistic opportunities for integrating aquaculture systems like seaweed farming.

BUSINESS MODEL

SeaStrut-SW's business model focuses on a clear value proposition that differs with current rope-based systems. SeaStrut-SW allows the autonomous control of the buoyancy of the beam. Reducing the risks of losing the production due to attenuation of wave loads, while offering buoyancy control to compensate for biomass growth or for storm protection. Moreover, it can be applied to other finfish, shellfish and other bivalves. Revenue strategy should be focused on:

- **Product Sales:** Direct sales of SeaStrut-SW systems to seaweed farming operators and offshore aquaculture developers.
- **Licensing Agreements:** Licensing of the variable buoyancy technology for adaptation by other aquaculture equipment manufacturers.
- **Service Contracts:** Offering installation, maintenance, and operational support services.
- **Collaborative Pilots:** Partnering with research institutions and aquaculture projects for data-driven improvements and scaling.
- **Grant funded R&D Projects:** Testing and evolving the system to new requirements,



POTENTIAL FINANCIAL OVERVIEW

Due to the characteristics of SeaStrut-SW the potential funding sources are:

European Union Programs

- **Horizon Europe:** The EU's R&D and innovation funding program, supporting projects focused on sustainability, blue economy, and renewable technologies.
- **BlueInvest Fund:** An investment initiative supporting innovative and sustainable solutions in the blue economy, such as SeaStrut-SW.
- **LIFE Programme:** A financing instrument for environmental conservation, renewable energy solutions, and circular economy projects.

Benefit: These programs offer grants and funding for product development, testing, and scaling within competitive calls for proposals.

Private and Public Investment Funds

- **Impact Investors:** Investment organizations or funds focused on delivering financial returns while creating a positive environmental impact. For example, Blue Horizon Ventures or Ocean 14 Capital, specializing in marine and sustainable technology solutions.
- **Green Transition Funds:** Initiatives promoted by the EU Green Deal or financial instruments from the European Investment Bank (EIB).

Benefit: Access to capital for scaling production, market validation, and deployment in target regions.

Alignment with Environmental Objectives

SeaStrut-SW could benefit from the EU Taxonomy due to direct support of several key environmental goals:

- **Climate Change Mitigation:** By promoting low-impact aquaculture (e.g., seaweed and shellfish production), SeaStrut-SW contributes to carbon sequestration and reduces emissions.
- **Sustainable Marine Resource Use:** Optimizing marine space utilization with modular, floating solutions that complement offshore wind farms.
- **Circular Economy:** Incorporating durable, modular, and reusable components minimizes waste and extends the product lifecycle.



TEAM & EXECUTION

The team and execution times will be carefully defined by the beneficiary partners of the results to be exploited.

GENERAL RECOMMENDATIONS

- **Certification and Validation:** Certify SeaStrut-SW as Taxonomy-aligned and compliant with EU sustainability standards.
- **Leverage EU Funding:** Apply for programs such as Horizon Europe, BlueInvest, and EIB green financing initiatives.
- **Strategic Partnerships:** Strengthen collaborations with offshore wind farms and aquaculture operators, highlighting the economic and environmental benefits of integrating SeaStrut-SW.



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