Enforce
Empowering Citizens for Environmental Action

D6.9 ENFORCE Exploitation and Activities Report – Initial

WP6 Impact Maximisation

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Deliverable Abstract
This document constitutes Deliverable D6.9, *ENFORCE Exploitation and Activities Report – Initial*, as part of the ENFORCE project. It is the first deliverable of the task 6.3, which is dedicated to Impact Maximisation. Deliverable D6.9 provides a comprehensive overview of the initial exploitation strategy, detailing the methodology for maximizing project impact, identifying Key Exploitable Results (KERs), and analysing the preliminary market landscape. By establishing the foundation for the project's exploitation framework, this deliverable supports the strategic dissemination of results to key stakeholders and ensures the potential for significant, tangible benefits. Furthermore it presents the exploitation strategy, the KERs , individual exploitation plans and an IPR strategy. The report also outlines future plans and actions for advancing the exploitation strategy, adapting to evolving market conditions and stakeholder priorities in subsequent project phases.

Keywords
Key Exploitable Results (KERs), Market Analysis, Stakeholder Engagement, Dissemination, Exploitation Framework, Strategic Planning, Tangible Benefits, Market Landscape, Project Outcomes.

Project Summary
Assuring environmental compliance requires a strong network of stakeholders, from citizens and researchers to governments and environmental organisations. Through creative toolkits and protocols, ENFORCE aims to tackle the frequent mismatch between the environmental data gathered by citizens and what authorities require for enforcement purposes. The project will address the challenges in data reporting coming from both the citizens side and the authorities' side, in order for the obtained data to be usable for environmental enforcement. In this line, ENFORCE introduces the concept of Data Readiness Level (DRL) to assess the maturity of data to be used as evidence in environmental compliance cases. In addition, the project will capitalize on the use of geo-spatial intelligence and AI-enhanced tools, strengthening their capacities, promoting good practices and preparing an inventory on geo-spatial intelligence and AI use. The proposed solution will ensure alignment with the Green Deal Data Space to ensure trustworthy data exchange among the relevant stakeholders. The project encompasses 8 case studies that involve all relevant actors including grassroots organizations, local and regional authorities and a diverse group of experienced researchers forming a scientifically robust interdisciplinary team. The lessons learnt and evaluation results from the case studies will feed the replication guidelines that will be promoted through the ENFORCE capacity building programme and associated policy recommendations to create a multiplier effect for the adoption of citizen science data to support environmental compliance.

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Executive Summary

This document, Deliverable **D6.9 ENFORCE Exploitation and Activities Report – Initial**, establishes critical foundations for the ENFORCE project's exploitation framework. It details the initial strategy for maximizing the project's impact under the exploitation activities, including a comprehensive methodology for identifying and advancing Key Exploitable Results (KERs).

The deliverable provides an analysis of the initial market landscape, aligning exploitation activities with the needs of stakeholders and ensuring relevance in the broader context. Additionally, this deliverable covers the exploitation pathways for the KERs, the business model and value proposition of the KERs, and IPR management.

Further, this report outlines the foundational activities essential for future exploitation efforts, emphasizing adaptability to evolving market conditions and stakeholder requirements. The document concludes with an overview of upcoming plans, focusing on strategic refinement and the continued alignment of exploitation activities with the goals of Work Package 6 (WP6).

1. Introduction

1.1. Purpose and Scope

This document represents Deliverable D6.9, ENFORCE Exploitation and Activities Report – Initial, of the ENFORCE project. It is the first deliverable within Work Package 6 (WP6), which focuses on Impact Maximisation.

Deliverable D6.9 provides an overview of the initial exploitation strategy developed for the ENFORCE project. It introduces the methodology adopted to maximize the project's impact, outlines the Key Exploitable Results (KERs) identified thus far, and includes an analysis of the initial market landscape relevant to these results. Additionally, this deliverable covers the exploitation pathways for the KERs, the business model and value proposition of the KERs, and IPR management. These elements are integral to ensuring the effective use and sustainability of the project's outcomes.

This report lays the groundwork for the project's exploitation framework by detailing the foundational activities and insights needed to drive its long-term success.

In alignment with the objectives of WP6, this deliverable emphasizes the strategic approach to ensuring the project's outcomes reach key stakeholders and achieve tangible benefits. The document also highlights the upcoming plans and next steps for the subsequent phases of the project, detailing how ENFORCE will build upon its initial strategy to adapt to evolving market conditions and stakeholder needs.

1.2. Relation to other tasks and deliverables

The development of the ENFORCE Exploitation and Activities Report – Initial is closely linked to the outcomes of several activities within **Work Package 6** and other WPs such as WP1, serve as a dynamic document that evolves alongside the project's development.

The documents and activities that are linked to the ENFORCE Exploitation and Activities Report – Initial are listed below:

- **D1.2 Data Management Plan – Initial**
  Implementation of an efficient Data Management Plan compliant with European and national regulations to protect partners and stakeholders from harm

- **D6.1 Communication plan and activities report – Initial**
  This deliverable will be updated at mid-term and at the end of the project reporting the conducted communication activities

- **D6.5 Dissemination and networking plan and activities report – Initial**
  This deliverable includes publications, participation in conferences and events, and networking with other EU and international relevant actors-related activities

The updated version of this report will be directly linked to the deliverables developed under the Work Packages associated with the KERs. As this is the first version of the document and reflects an early stage of the project, it is not yet possible to list other relevant deliverables that will be submitted later in the project timeline.

1.3. Document Structure

The **D6.9 ENFORCE Exploitation and Activities Report – Initial** is structured as follows:

Chapter 1: Introduction

This chapter provides an overview of the deliverable's purpose, scope, and alignment with the objectives of Work Package 6. It highlights the importance of impact maximization in the context of the ENFORCE project and introduces the structure of the document.

Chapter 2: Initial Exploitation Strategy

This chapter presents the initial exploitation strategy, detailing the methodology used to identify and prioritize the Key Exploitable Results. It outlines the steps taken to ensure effective planning for the project's exploitation activities and introduces the strategic framework that will guide future efforts.

Chapter 3: Key Exploitable Results

This chapter presents the KERs of the project and provides the first version of the value proposition canvases. It includes an overview of each KER and its potential for exploitation.

Chapter 4: Individual Exploitation Plans

This chapter presents the first version of the individual exploitation plans for each partner within the consortium, detailing how each partner intends to contribute to and capitalize on the KERs.

Chapter 5: Market Research and Analysis

This chapter focuses on the initial market research and analysis conducted as part of the exploitation strategy. It examines the current market landscape, identifies key trends and opportunities, and provides an assessment of potential stakeholders and target audiences for the project's results.

Chapter 6: Intellectual Property Rights Strategy

This chapter outlines the intellectual property rights (IPR) strategy for the project, detailing how the intellectual assets will be protected, managed, and exploited. It covers aspects of patenting, licensing, and collaboration agreements.

Chapter 7: Conclusions and Next Steps

The final chapter summarizes the key findings from the initial exploitation activities and provides a roadmap for future actions. It outlines the planned activities for the next phases of the project, identifying the priorities for refining and implementing the exploitation strategy as the project progresses.

2. Exploitation Strategy

Exploitation involves the practical application of project results to develop, enhance, or market new products, processes, or services. It also extends to contributing to standardization efforts or influencing policy development. Exploitation can take various forms, such as commercial, societal, or political applications, and can include improving public awareness or encouraging action. It also involves facilitating the use of results by others, for example, through open licensing or offering recommendations for policy development based on the project's findings.

The focus of exploitation is to transform research outcomes into tangible solutions that positively affect society. This can mean scaling innovative technologies, informing policy decisions, or creating tools that engage the public and address their needs. In the context of ENFORCE, exploitation goes beyond simply disseminating knowledge; **it aims to translate the project's innovations into practical applications that enhance environmental governance, improve compliance, and empower citizens and stakeholders.** As outlined in Article 39 of the Horizon Europe regulation[1], both exploitation and dissemination are crucial obligations that ensure project results lead to meaningful societal benefits.

ENFORCE aims to address the critical issue of environmental compliance by establishing a pan-European **collaboration and knowledge hub** rooted in Living Lab principles[2]. This hub will serve as an open innovation framework that unites European actors to enhance environmental compliance assurance.

The primary problem ENFORCE is tackling is the **gap in effective environmental monitoring, reporting, and enforcement** due to systemic barriers such as limited citizen engagement, fragmented data sources, and insufficient mechanisms to transform data into actionable outcomes. ENFORCE offers a solution by combining citizen science, advanced technology, and collaborative frameworks to empower stakeholders and drive measurable improvements in compliance.

[1] L_2021170EN.01000101.xml
[2] Living Labs - ENoLL

The solution proposed by ENFORCE is innovative and comprehensive. By leveraging citizen science, the project advances co-created and collaborative citizen-collected evidence that empowers individuals to identify, monitor, and report environmental non-compliance effectively.
ENFORCE integrates advanced tools like AI-driven citizen engagement strategies, geospatial intelligence, and FAIR data principles[3] to ensure robust and legally valid evidence collection. This framework not only enhances the accuracy and legitimacy of data used for enforcement but also bridges the gap between local communities, innovators, and enforcement agencies, creating a holistic ecosystem for environmental governance.

ENFORCE adds value by addressing gaps that traditional systems fail to fill, such as the lack of accessible citizen participation and limited use of cutting-edge technology in compliance enforcement. The competitive advantage lies in its Living Lab approach, **which ensures the co-creation of sustainable mechanisms tailored to specific regional challenges.** By aligning with the EU's pillars of compliance—promotion, monitoring, and enforcement—ENFORCE develops scalable and replicable solutions to environmental challenges.

The project's capacity-building initiatives, coupled with tools like the ENFORCE Plaza, provide an all-in-one platform for data collection, knowledge exchange, and stakeholder collaboration.

- **Promoting Compliance**: Engaging citizens through digital tools, encouraging voluntary audits, and co-developing plans for pre-crime environmental risks.
- **Monitoring Compliance:** Creating guidelines and frameworks to integrate diverse data types, ensuring evidence is admissible in court and actionable.
- **Enforcing Compliance**: Strengthening the prosecution chain by training stakeholders, bridging gaps between academia, technology, and courts, and enabling better enforcement through digital evidence.
- **One-Stop-Shop for ECCI:** Establishing the ENFORCE Plaza, which will house tools, data, and resources for stakeholders to engage with environmental compliance initiatives effectively.

Expected outcomes include enhanced citizen engagement, scalable compliance methodologies, and tools that enable cross-sectoral collaboration, all tested through eight pilots across seven countries. By creating a replicable model and policy recommendations, ENFORCE ensures its solutions can extend beyond Europe, setting a new standard for environmental compliance worldwide.

To achieve its ambitious objectives, ENFORCE will deliver several key exploitable results designed to enhance environmental compliance across Europe and beyond. Central to this effort is the development of the ENFORCE Plaza, a one-stop shop for Environmental Compliance through Citizens and Innovation (ECCI).

The Plaza will feature four specialized sub-plazas:

[3] FAIR Principles - GO FAIR

1. **Data Plaza:** This sub-plaza will introduce the **Environmental Compliance Data Readiness Level** (EC-DRL) concept, providing a structured pathway for data certification. It ensures that data collected from diverse sources—such as citizens, satellite imagery, and field sensors—meets the legal and quality standards necessary for compliance monitoring and enforcement.

2. **Citizens' Plaza:** This space will engage stakeholders in Living Labs, fostering collaboration and co-creation. By actively involving citizens in compliance initiatives, the Citizens' Plaza will strengthen public participation in environmental monitoring, empowering communities to take ownership of local challenges.

3. **Knowledge Plaza:** Designed to support the replication and scaling of ENFORCE tools, the Knowledge Plaza will offer resources such as capacity-building programs, access to success stories, and legal guidance. This sub-plaza ensures the sustainability and adaptability of ENFORCE's methodologies across diverse settings.

4. **Tools Plaza:** This component will provide advanced tools for data collection, analysis, and visualization, including support for data provenance and explainable AI. These tools will enhance the accuracy and reliability of evidence, ensuring its admissibility in enforcement processes.

In addition to the **ENFORCE Plaza**, the project will test and evaluate its approach through **eight diverse pilots** in seven countries, demonstrating the practical applicability and scalability of its methodologies and technological assets. These pilots will explore various environmental contexts, providing critical insights into how ENFORCE's tools and strategies can address regional challenges effectively.

ENFORCE will also promote a user-uptake and capacity-building strategy aimed at fostering long-term engagement and adoption of its tools and methods. This strategy will include tailored training programs for stakeholders, including citizens, compliance authorities, and legal professionals, ensuring they can utilize ENFORCE's solutions effectively. The project will culminate in a set of policy recommendations that will enable the expansion of ENFORCE tools and methodologies into different global contexts, furthering its impact on environmental compliance and governance.

Through these exploitable results, ENFORCE provides a unique and comprehensive framework that bridges gaps in environmental compliance assurance, empowering citizens, and enabling authorities to enforce regulations more effectively. By integrating cutting-edge technology, innovative methodologies, and a collaborative ecosystem, ENFORCE not only addresses current challenges but also sets the foundation for a more sustainable and compliant future.

2.1. Methodology

The methodology used for the exploitation strategy is a dynamic and collaborative approach, incorporating iterative planning, co-creation, and continuous refinement to ensure the effective utilization of ENFORCE's outcomes.

- **Initial Exploitation Plan:** The process begins with the development of an initial exploitation plan that outlines the foundational strategies for utilizing the project's outcomes. This step establishes the groundwork for identifying Key Exploitable Results and framing preliminary exploitation pathways. This deliverable is the document covering the initial exploitation plan which will be further developed in the duration of the project.

- **Initial Business Canvases:** Following the initial plan, business canvases are created to explore and define specific business opportunities. These canvases serve as tools for detailing value propositions, target markets, revenue streams, and operational strategies for the exploitation of ENFORCE's outcomes.

- **Internal and External Co-Creation Workshops:** The strategy incorporates co-creation workshops, engaging both internal project partners and external stakeholders. These workshops aim to refine the exploitation strategy through collaborative discussions, stakeholder feedback, and alignment with market needs.

- **Final Exploitation Plan and Business Canvases:** Based on the insights gathered from the workshops and ongoing analysis, the final exploitation plan and business canvases are developed. This comprehensive document integrates updated strategies, IPR considerations, refined business models, and a roadmap for post-project exploitation.

This approach ensures that the exploitation strategy evolves dynamically, incorporates diverse perspectives, and aligns with market and stakeholder demands, ultimately maximizing the impact and sustainability of the ENFORCE project's outcomes.

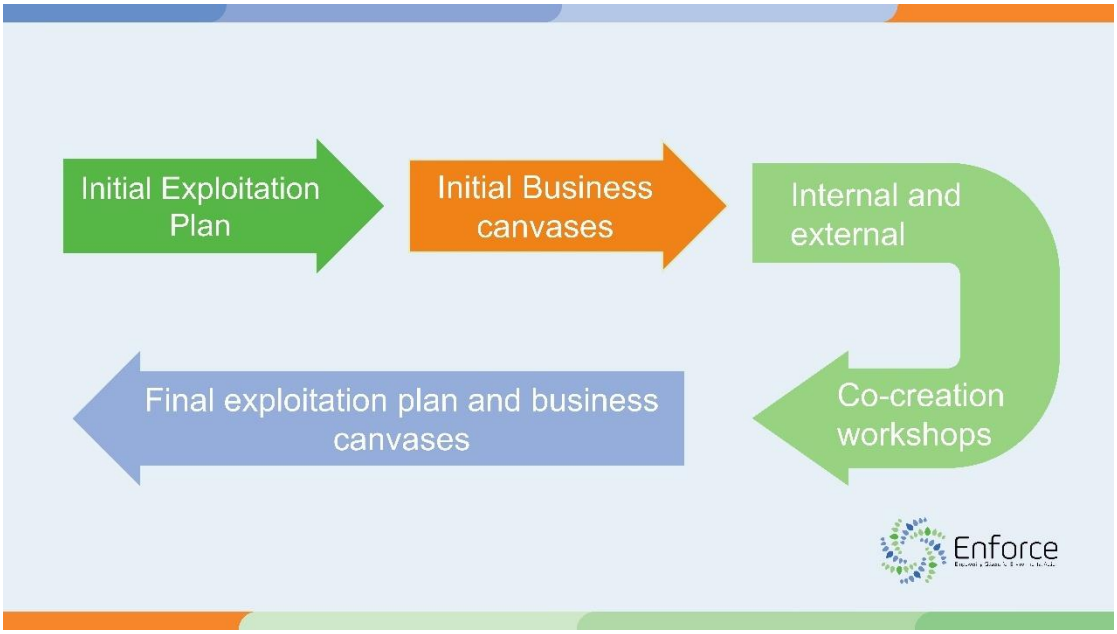


Figure 1 Exploitation Process

2.2. Value Proposition Canvas

As part of the methodology, we are employing a value proposition and business canvases approach to effectively structure and evaluate the exploitation strategy.

In the framework of WP6 activities, we have developed and provided templates to the consortium members, complemented by guiding questions to assist partners in systematically analysing and defining the exploitation potential of their respective KERs.

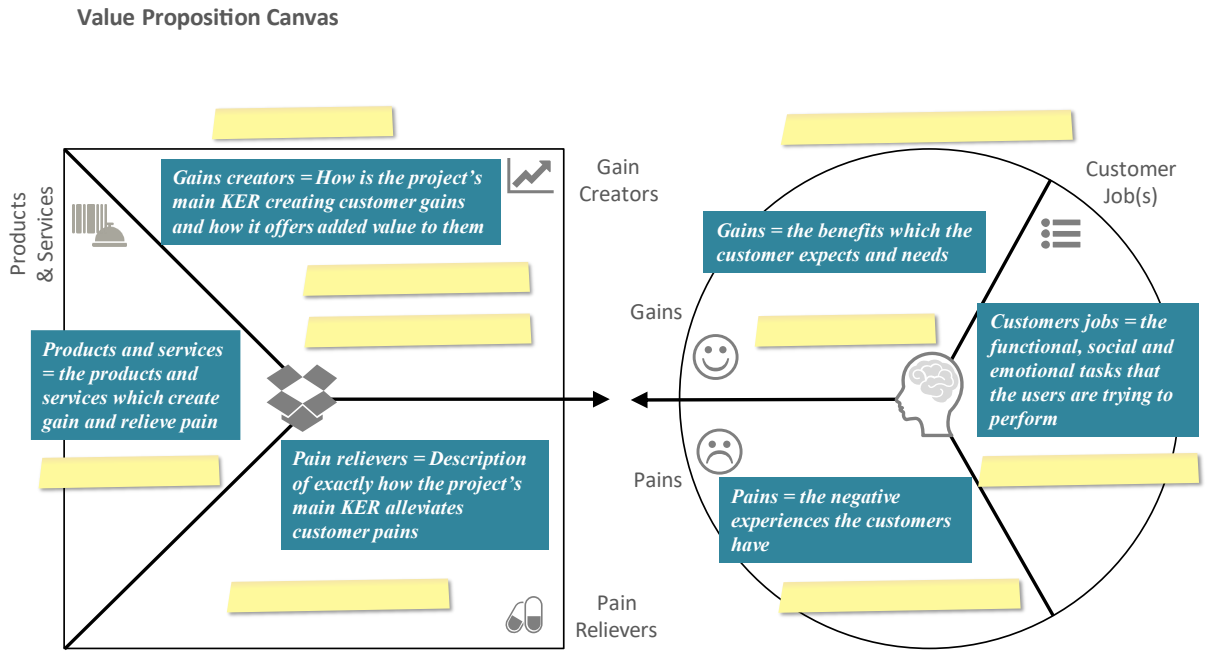


Figure 2 Value Proposition Canvas

The graphic above represents a **Value Proposition Canvas**, structured to align the **Value Proposition** provided by the project's KERs with the needs and challenges of the target **User Profile**.

It is divided into two main sections:

Value Proposition (Provided by the Exploitable Results):

- **Gains:** The benefits that users expect and need from the KERs, such as desired improvements or positive outcomes.
- **Pains:** The negative experiences, challenges, or obstacles that users currently face.
- **Customer Jobs:** The functional, social, and emotional tasks that users are trying to perform or achieve.

User Profile (Different Users of the Exploitable Results):

- **Gain Creators:** Describes how the KER generates customer gains and delivers added value to users.
- **Pain Relievers:** Explains how the KER alleviates user pains, addressing their specific challenges.
- **Products and Services:** The specific offerings provided by the project that create gains and relieve pains.

This **Value Proposition Canvas** serves as a framework to demonstrate how the project's offerings directly address user needs and provide solutions to their challenges. The structure ensures a user-centred approach by identifying how the **products and services** can enhance user experiences, relieve pain points, and create meaningful benefits.

2.3. Business Model Canvas

The graphic below represents the Business Model Canvas, a tool designed to outline the key components of a business model.

It is divided into nine sections:

1. **Key Partners**: Identifies the external entities that provide resources or support for the project.
2. **Key Activities**: Describes the crucial activities required to deliver the value proposition.
3. **Value Proposition**: Explains the value delivered to customers and how it addresses their needs.
4. **Customer Relationships**: Details the type of relationships the project will establish with customers.
5. **Customer Segments**: Defines the target customer groups and their specific needs.
6. **Channels**: Describes how the value proposition will be delivered to customers.
7. **Key Resources**: Identifies the essential resources needed to execute the business model.
8. **Cost Structure**: Outlines the main costs associated with running the business.
9. **Revenue Streams**: Defines how the business generates income from its value proposition.

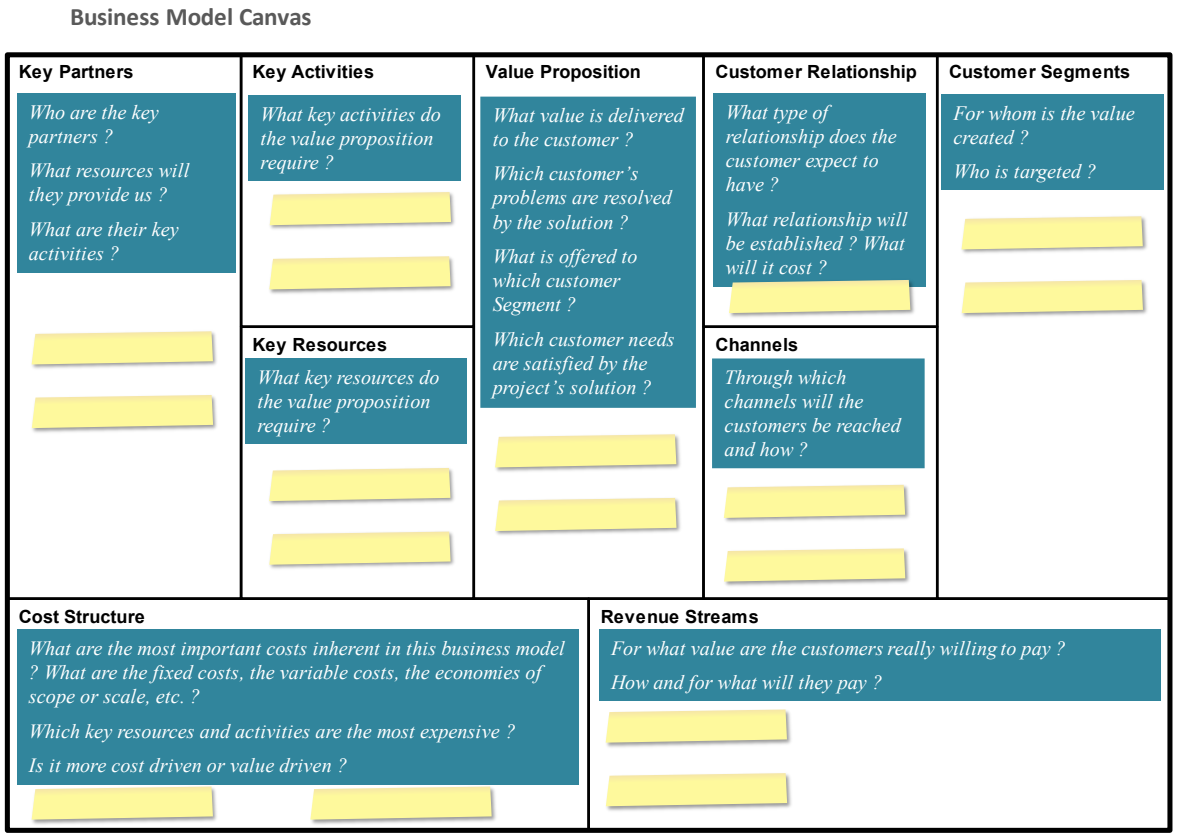


Figure 3 Business Model Canvas

The Business Model Canvas helps ensure that the project's KERs are aligned with customer needs and the business environment, providing a clear framework for defining and evaluating the exploitation potential of these results.

3. Key Exploitable Results

ENFORCE introduced a total of six KERs, each designed to address specific challenges and provide valuable solutions within the project's scope. These KERs represent the core innovations and outcomes that have the potential to be adopted and exploited.

The following section describes each of these KERs in detail. *Please note that additional KERs might be identified at a later stage of the project, and this information will be updated in the subsequent version of the deliverable*

The below tables are an initial version, and throughout the project, as outcomes from the workshops and the general activities of the project evolve, these will be further refined.

Specifically:

- **Key Exploitation Pathways**: This section will detail the steps and strategies to advance the KERs to higher Technology Readiness Levels[4] (TRLs) both during the project and beyond, ensuring readiness for practical application and adoption.

- **Implementation Estimation**: This section will provide a clear estimation of when each KER will be made available on the market, in open access, or through other means, including specific timelines (e.g., approximately three years post-project completion).

These updates will ensure a robust and actionable exploitation strategy for all identified and future KERs.

I. Co-creation methodology for future uptake

Title	Co-creation methodology for future uptake
Type:	Methodology, Training, Material;
Key Contributors:	ENoLL
Main Related needs:	The involvement and empowerment of citizens and other ECCI relevant stakeholders in the design of solutions for environmental compliance;
Potential Users:	Agencies of the Quintuple Helix (Academia, Government, Industry, Civil Society, Environment);
Potential Customers	Public authorities, Environmental agencies, Inspectorates and Law enforcement entities;
Key Exploitation Pathways	Reference methodological handbook for co-creation journey supporting the development of Living Labs, including tips, tools and practical experiences by ENFORCE;
Implementation Estimation:	ENFORCE will create 8 Living Labs in the Case Studies focusing on ECCI and will implement the co-creation methodology in them, which will be improved through an iteration process with the stakeholders, taking into account their feedback. This methodology will be used in future Living Labs focusing on Environmental Compliance.

II. Data Certification Pathway

Title	Data Certification Pathway
Type:	Methodology
Key Contributors:	CSIC

[4] TRL | EURAXESS

Main Related needs:	To develop a structured Data Readiness Level (EC-DRL) framework for Environmental Compliance, which assesses and validates the suitability of data for specific regulatory purposes. The EC-DRL will serve as the core tool within ENFORCE, providing a techno-legal framework that aligns varying levels of data qualification with their potential applications in the context of environmental compliance.
Potential Users:	All the stakeholders interested in using validated/certificated data for environmental compliance
Potential Customers	Research, academia, private sector, municipalities, public sector;
Key Exploitation Pathways	Reference method to evaluate the environmental compliance connecting the legal requirements of data quality with the tools and technologies to validate and certificate data. A reference framework for evaluating environmental compliance by linking data quality legal requirements with the tools and technologies needed for validation and certification. ENFORCE plans to validate the concept of EC-DRL through its application in the different case studies proposed. The main ambition is that the EC-DRL will be recognised in the future as the reference for environmental compliance maturity as TRL has been accepted to evaluate the technological maturity;
Implementation Estimation:	.ENFORCE plans to progressively apply the concept of EC-DRL to map levels of data maturity for environmental compliance, addressing the implications of uncertainties in collected data for use in regulatory and environmental directives. The project aims to validate the EC-DRL framework through its application in real-world case studies, targeting **TRL 7** by the project's conclusion, where the system prototype is demonstrated in an operational environment. The ultimate ambition is to achieve recognition of the EC-DRL as a reference standard for assessing environmental compliance maturity, comparable to the established role of TRL in evaluating technological readiness. This recognition is expected to occur within **2-3 years after project completion**, following further refinement, stakeholder engagement, and regulatory endorsement.

III. Data Space Compliance Tools

Title	Data Space Compliance Tools
Type:	Technology, Standards
Key Contributors:	SLG, IDC, 52N, CSIC;
Main Related needs:	Citizen science data needs to be integrated with other data coming from public or other authoritative sources;
Potential Users:	Data and Data Space stakeholders
Potential Customers	Data and Data Space stakeholders
Key Exploitation Pathways	Standard-compliant open-source data connector implementation for upscaling the integration of the platform with citizen science data and external data sources; Offer open-source tools to support citizen data certification (CSIC, 52N);

	Contribute to standards for citizen science data integration in the Green Deal Data Space (IDC); Enhance SLG Data Space compliant platform; Leveraged by 8 pilots;
Implementation Estimation:	ENFORCE will develop these tools and will contribute to a Use Case in the Green Deal Data Space, which will focus on Environmental Compliance.

IV. ENFORCE Plaza Tools

Title	ENFORCE Plaza Tools
Type:	Technology, AI models
Key Contributors:	UNEXE, UNIBI, SLG, 52N, AMRN;
Main Related needs:	To have a single place for any stakeholder interested in environmental compliance;
Potential Users:	Citizens, start-ups and technology companies, public authorities, law enforcement agencies, data stakeholders;
Potential Customers	Citizens, start-ups and technology companies, public authorities, law enforcement agencies, data stakeholders;
Key Exploitation Pathways	Upscale of existing AI tools to support the target applications at TRL5; Open-source coding of AI models for reuse from other researchers and reproducibility; Leveraged by pilots and extensive evaluation; Potential commercialization of specific applications (SLG);
Implementation Estimation:	The ENFORCE Plaza tools will be developed with the Tools sub-plazas and will be tested and validated in the CSs.

V. Pilot Demonstrators

Title	Pilot Demonstrators.
Type:	Applications, Datasets
Key Contributors:	All pilots
Main Related needs:	To demonstrate the solutions developed in ENFORCE in a real-life environment, addressing real enforcement needs
Potential Users:	Public authorities, environmental agencies and other law enforcement entities that will want to implement tools in their area will be able to see from the pilots how the tools were implemented and benefit from lessons learnt;
Potential Customers	Public authorities, environmental agencies and other law enforcement entities that will want to implement tools in their area will be able to see from the pilots how the tools were implemented and benefit from lessons learnt;
Key Exploitation Pathways	The demonstrators will be showcases of the innovations developed in ENFORCE, which includes technological and social innovations;
Implementation Estimation:	Eight pilot demonstrators will be showcased in all Case Studies in ENFORCE in 7 countries addressing biodiversity, illegal logging and pollution

VI. User Uptake, Capacity building and policy recommendations

Title	User Uptake, Capacity building and policy recommendations
Type:	Methodology;
Key Contributors:	EARSC, ECSA
Main Related needs:	Informing decisions and actions for the benefit of society and of the environment through coordinated, comprehensive EO, is the core vision of ENFORCE;
Potential Users:	Multipliers of the community of users pre-identified by the use cases and the consortium partners: research, academia, private sector, municipalities, public sector, association of category
Potential Customers	Multipliers of the community of users pre-identified by the use cases and the consortium partners: research, academia, private sector, municipalities, public sector, association of category
Key Exploitation Pathways	The case studies will be brought together with multipliers and a community of practices as part of the user uptake exercise. The project is not only committed to significantly contribute to capacity building among current and potential users; it will also strive to identify best practices in co-creation and capture them in appropriate guidelines that will help users beyond the immediately engaged community;
Implementation Estimation:	Number of spinoff products /services created through interactions with users as part of the project user uptake; number of policy briefs delivered (4, partners responsible: EARSC and ECSA); number of case studies applying for funding to deliver new services (8), training sessions delivered (3 per year on years 3 and 4 (6 total), T5.3.4).

3.1.KER Value Proposition

During the proposal phase, we presented the Business Canvas for the **ENFORCE Plaza** (see the figure below), focusing on its value proposition and user profile as a basis of the project.

In this chapter, we extend the same approach to the other remaining KERs providing their respective Value Proposition Canvases.

KER Title	Partner in charge:
• **Co-creation Methodology for Future Uptake**	ENoLL
• **Data Certification Pathway**	CSIS
• **Data Space Compliance Tools**	SLG, 52N, CSIS
• **Pilot Demonstrators**	AMRN
• **User Uptake, Capacity Building, and Policy Recommendations**	EARSC, ECSA

It is important to note that the canvases presented below are initial versions. We will continue to collaborate with the KERs throughout the project, closely monitoring their evolution and adapting

the canvases as the results develop. We will gather feedback from users during the project and the external exploitation workshop.

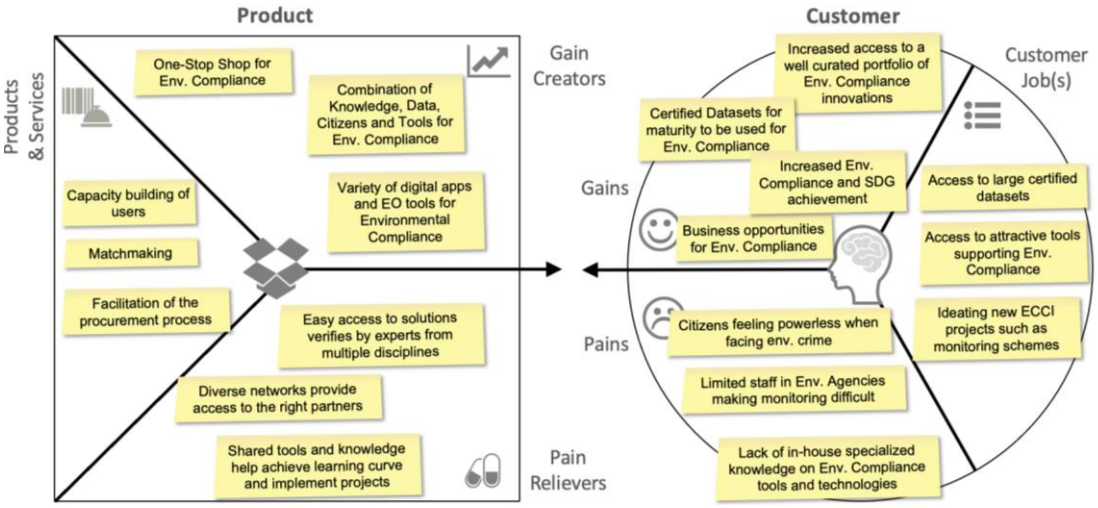


Figure 4 ENFORCE Plaza Canvas

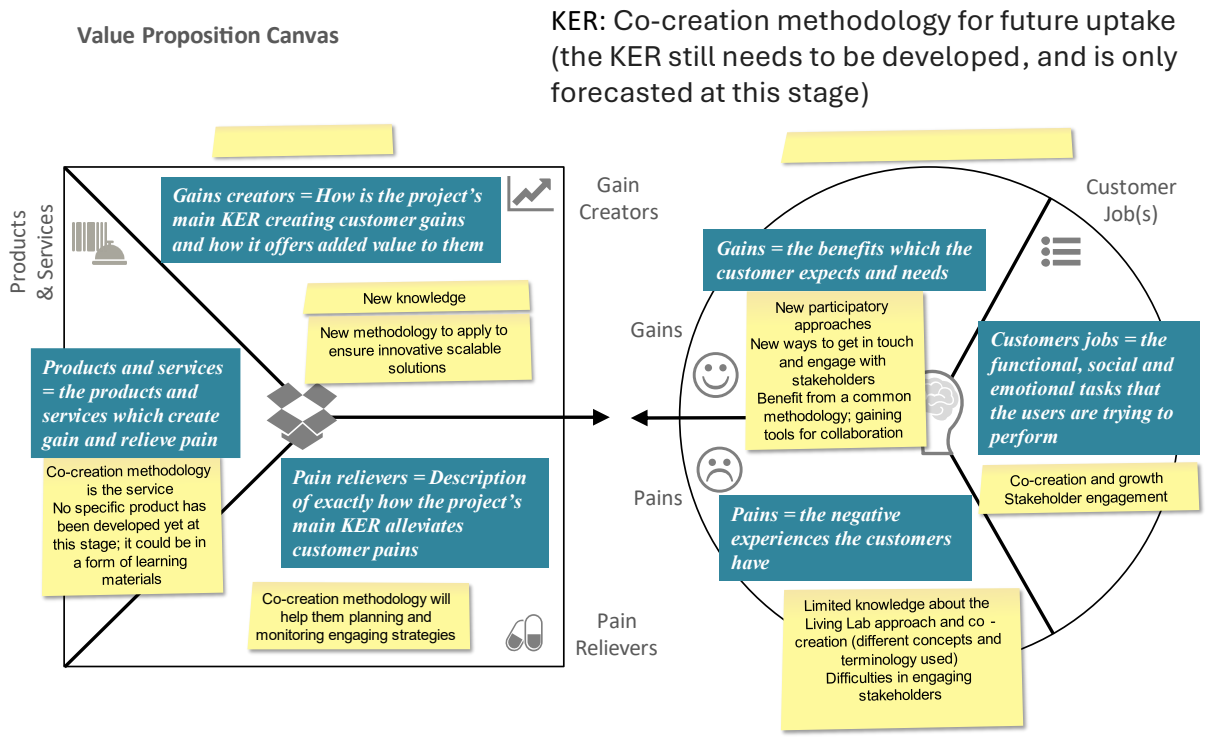


Figure 5 Co-creation Methodology for Future Uptake

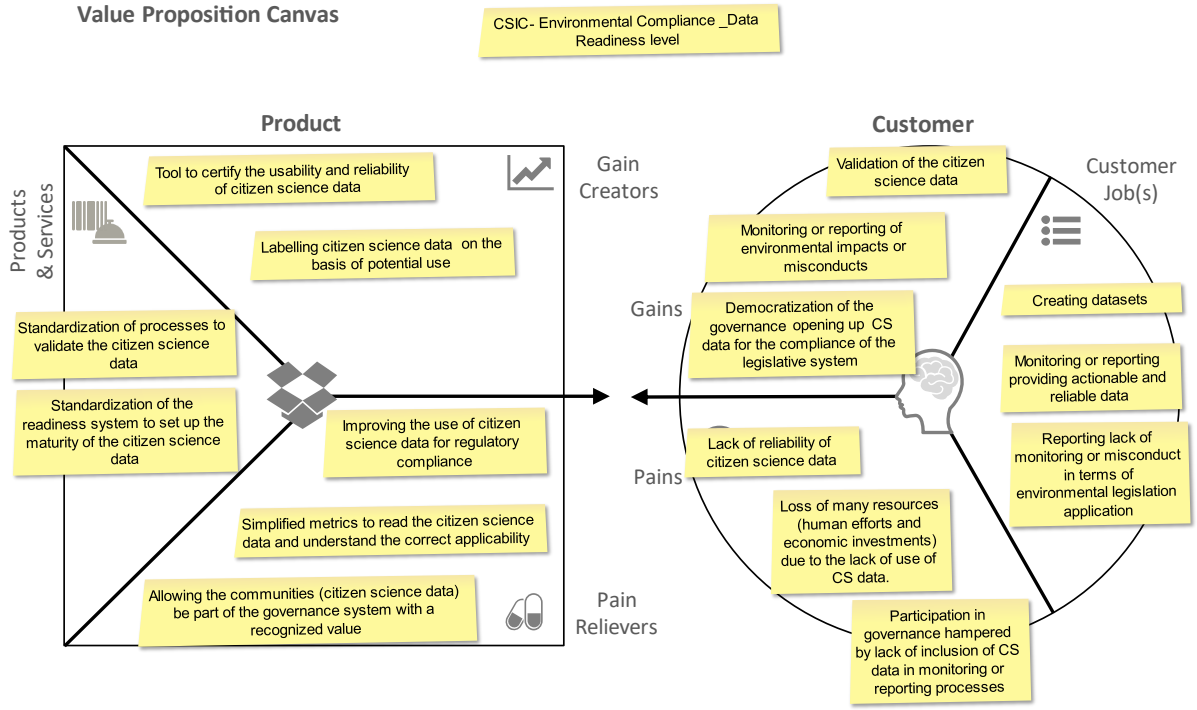


Figure 6 Data Certification Pathway

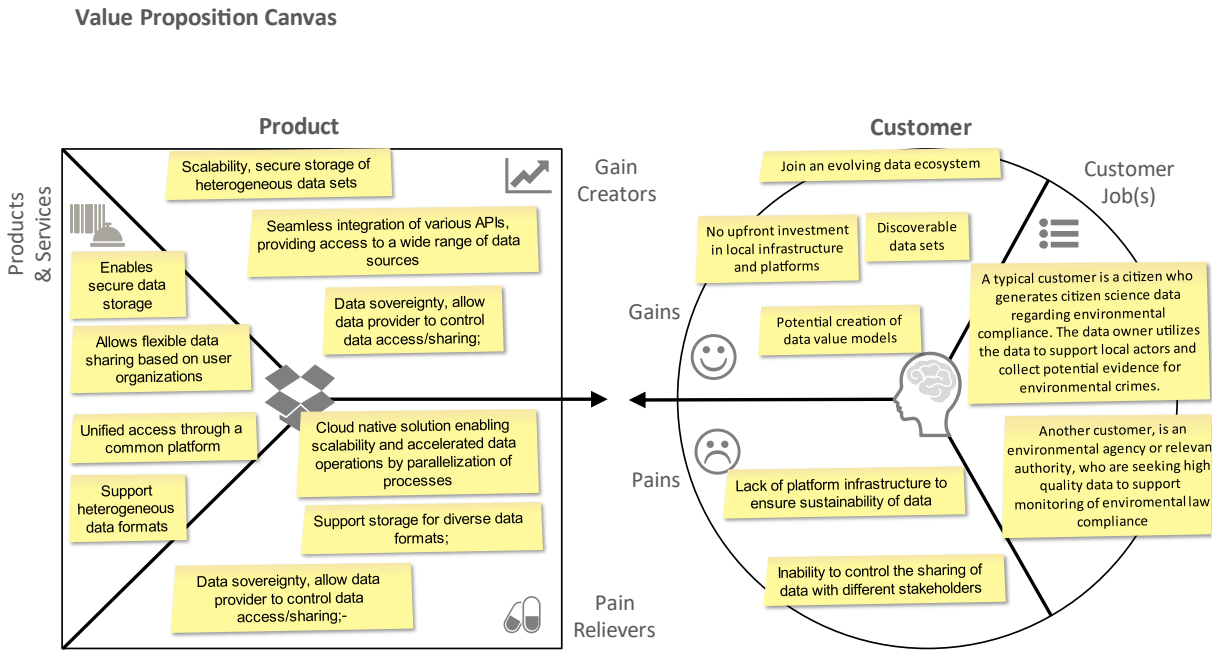


Figure 7 Data Space Compliance Tools

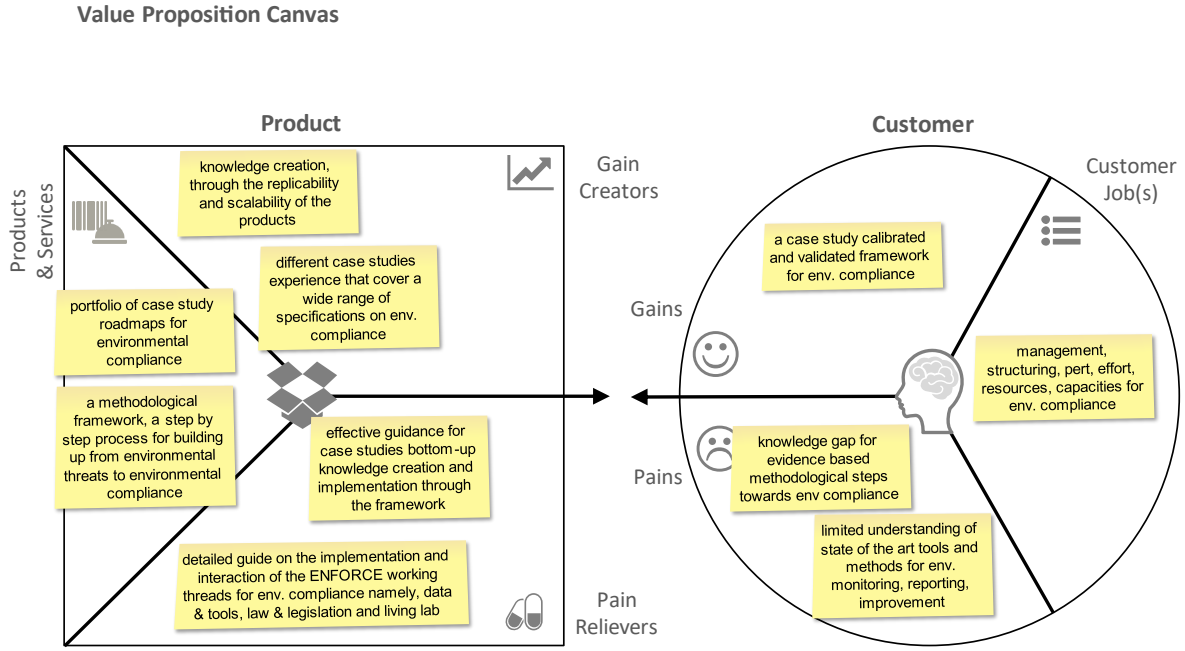


Figure 8 Pilot Demonstration

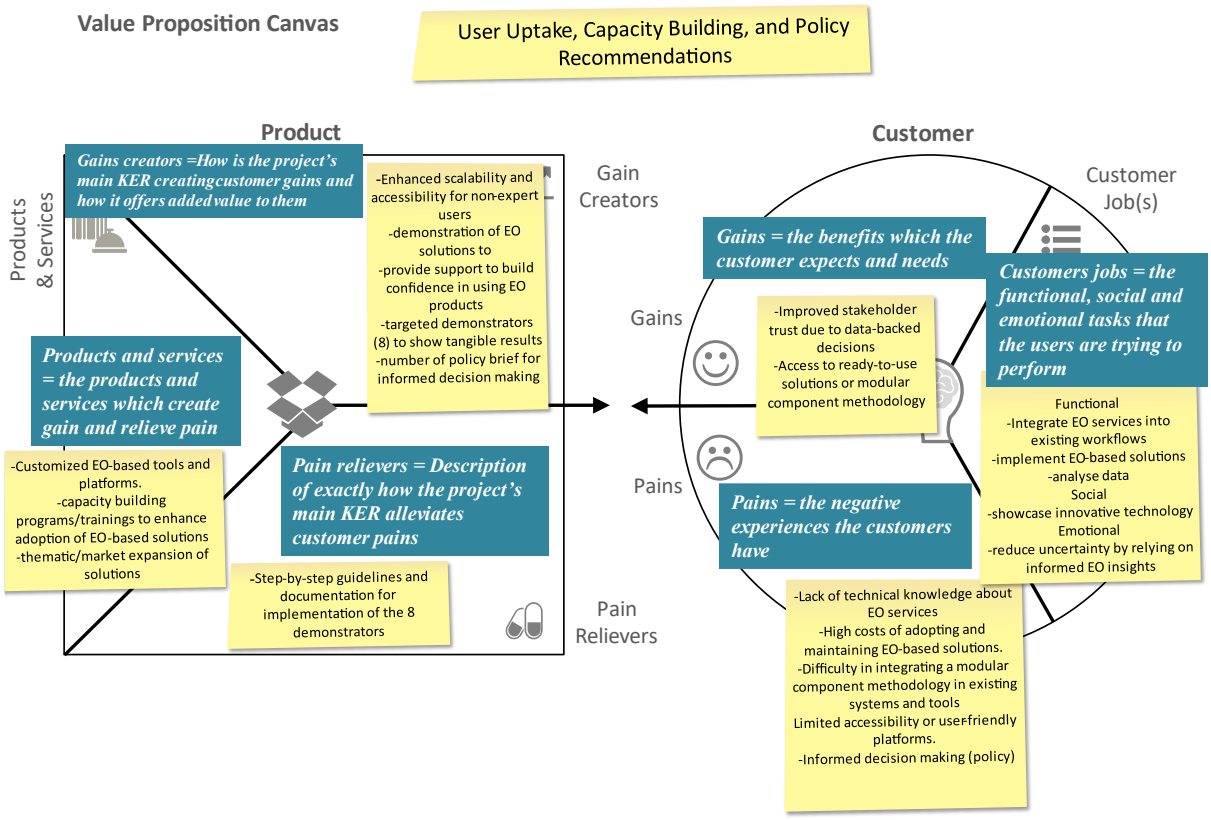


Figure 9 User Uptake, Capacity Building, and Policy Recommendations

In conclusion, it is important to emphasize that the Value Proposition Canvases presented in this chapter are preliminary drafts, as the project is currently in its early stages, at month 5.

As ENFORCE progresses and the KERs evolve, these canvases will be refined and updated. This iterative process ensures that the value propositions for each KER remain aligned with the overall exploitation strategy and continue to reflect the emerging opportunities and advancements within the project. Updated versions of these canvases will be included in forthcoming deliverables on exploitation, offering a comprehensive and matured analysis of all KERs as the project develops.

4. Individual Exploitation Plan

This chapter presents the initial outline of the individual exploitation plans of the consortium members involved in the ENFORCE project. These plans serve as a starting point and will be further developed and refined as the project progresses, ensuring alignment with the project's outcomes.

Exploitation of Result

- Each beneficiary must use its best efforts to exploit the results it owns or have them exploited by another legal entity.
- Exploitation may be direct (by beneficiaries) or indirect (through transfer and licensing of results).

4.1. G.A.C. Group

Coordinator **G.A.C. Group** will use its large network of related European projects to promote the project and its results (ECCP, ReConfirm, ARSINOE, NEXOGENESIS, etc.). G.A.C. Group has over 20000 LinkedIn followers. Through its participation in the ENFORCE project, G.A.C. Group will reinforce and finetune its capacities in stakeholder engagement, co-creation, communication, dissemination, exploitation, and impact maximisation approached with feedback from various populations in European countries, thus improving its value proposition. Also, G.A.C. Group will build upon the best practices in the field of dissemination for further developing its offer towards ENFORCE potential users. G.A.C. Group will support exploitation of ENFORCE results into European and non-European countries.

4.2. EVI, AMRN, BDG

Similarly, three more SMEs are part of the consortium—**EVI**, **AMRN** and **BDG**—and they are interested in growing their portfolios of solutions that they offer to their clients with the ENFORCE plaza outcomes. They plan to become major players in the innovative ecosystem of environmental compliance by linking up with the Case Studies and involving the stakeholders and finetuning their position in the market.

4.3. CSIC, UNEXE, UNIBI, UoC, HU, IIASA, 52N and NIRDF

ENFORCE RTD partners (Universities and Research Centres), namely **CSIC**, **UNEXE**, **UNIBI**, **UoC**, **HU**, **IIASA**, **52N** and **NIRDF** will further exploit the results by organising and linking the exposure of postgraduate students and PhD to ENFORCE with the aim of furthering the related research through the allocation of new PhDs in the field of Environmental Compliance, in relation with international industrial partners. It will also organise special sessions in International Conferences (e.g. HIC, WDSA, CCWI, IAHR, CEMEPE, EWRA, GNEST, ACM principles of Advanced and Distributed Simulation (PADS) conference, IWA specialised conferences) and special issues in journals (e.g. Hydroinformatics, Urban Water, ASCE journals, Simulation: Transactions

of the **SCS, ACM** Transactions on Modelling and Computer Simulation (TOMACS), Journal of Simulation (JOS), and STOTEN.

ENFORCE RTD partners are members are in the scientific committees of all of these and can (as they have done in the past for other projects) ensure the success of such dissemination schemes. Also, they will act as links with the EU clusters (ICT4Water Cluster—many partners are members and lead Working Groups), Water Europe for furthering the exploitation of ENFORCE (Prof. Laspidou is the Vice-President of Collaboration), Climate Adaptation Community of Practice, etc. Partners are engaged in editorial activities of several journals (including leading special issues on modelling methodology) and routinely serve as Chairs in conference committees and will continue to do so for ENFORCE.

4.4.SLG and IDC

Industrial partners **SLG** and **IDC** will be important in exploitation activities.

Specifically, **SLG** is interested in extended its Data Space compliant offerings to integrate EO and non-EO data and facilitate the integration of citizen science data. In addition, SLG together with its mother company Space Hellas, have significant experience with law enforcement digital solutions for the Greek authorities as well as for European R&D funded projects (e.g., SPIRIT project). Therefore, ENFORCE is an opportunity perfectly aligned with the strategic goals of the group to develop innovative services for this domain.

The second industrial partner, **IDC,** is a market intelligence company, and will use the data gathered by the project to enrich our market views and go deeper into the topic of environmental compliance, which will impact many companies in the short-to-medium term. IDC will link the activities in ENFORCE with our business line on sustainability. In addition, as coordinators of the Green Deal Data Space we expect this project to provide sound input on how citizen-generated data can be integrated as certified and trusted data source for the upcoming implementation of the data space. Connections are also expected with other data-space related activities run by IDC (e.g. manufacturing data space, tourism data space).

4.5. ENoLL, EARSC, ECSA, ASUD, HBA, EG and D4P

A large group of associations are partner in ENFORCE, namely **ENoLL**, **EARSC**, **ECSA**, **ASUD** and **HBA, EG** and **D4P**. They all have a strong interest in setting up methodologies that will be exploited through their partners.

ECSA finds the work of ENFORCE central to the activities and interests of their partners and for promoting citizen science overall in societies and enabling them to feed policies consistently and feed large environmental data spaces.

EARSC is interested in exploiting Earth Observation technologies and in making significant advances in Earth System Science modelling and downstream product development. User uptake and capacity building will further strengthen the position of the members of EARSC.

For partner **ENoLL,** the methodological framework developed within ENFORCE will be further exploited within the ENoLL network, feeding the capacity building and other services offered to applicant and experienced Living Labs. Living Labs created within ENFORCE will be invited to join the ENoLL network upon certification and invited to collaborate with the existing Action Oriented Task Forces and Working Groups (e.g., AOTF on Energy and Environment) to support knowledge exchange, co-creation and further collaboration beyond the duration of the project. Where relevant, ENoLL will facilitate the collaboration of ENFORCE Living Labs with the 100 Soil Health Living Labs funded under the EC Mission "A Soil Deal for Europe" thanks to its leading role in the Framework Partnership supporting the development and deployment of such network (GA 101112782, currently under Grant Agreement Preparation). ASUD is a grass-roots organization in Italy that is interested in enriching their citizen engagement platforms and will use the methodologies developed in ENFORCE in their other projects, while HBA is a Bar Association that is very active in the field of environmental compliance and is interested in advancing knowledge in this field for their members.
EG and D4P are interested in exploiting ENFORCE outcomes to their international members to gain in visibility and expand the reach of ENFORCE tools in other markets beyond Europe.

4.6. Waag Futurelab , CIHEAM and WRT

In a similar way, the **Waag Futurelab** will exploit the outcomes of ENFORCE to its citizen members but also will exploit the tools further at a national and EU level through collaborating Futurelabs.

The international organization **CIHEAM** will exploit the ENFORCE results by disseminating the outputs among its global network and specifically through its thematic Communities of Practice. CIHEAM will integrate the methodologies and approach developed through ENFORCE in its global knowledge and capacity building strategy.

The NGO partner **WRT** will work to ensure that the outputs are fully integrated with and support local plans, strategies, and delivery mechanisms. They will disseminate the ENFORCE outputs throughout the Catchment Based Approach, Community in England (104 local partnerships), the Rivers Trust Movement (56 organisations), South West Water, the Defra family organisations (nationally and locally), the academic/technical community (especially those interested in co-creation of ECCI) and with Devon County Council, other local councils and the various Climate Emergency/Action Groups now active in Devon. ENFORCE will help WRT integrate this expertise into an effective approach with high innovation and impact potential in environmental compliance.

4.7. BCASA

Public authority **BCASA** plans to raise awareness of the project aims and subsequent results at the local and national levels through stakeholder engagement with local communities together with national bodies. Through stakeholder engagement with the local community, it will establish bi-directional communication

channels for sharing and recording data regarding environmental compliance. The stakeholder engagement will provide increased knowledge on compliance monitoring and enforcement to the local community; solutions will be trialled for local authorities. This could then be rolled out to other local communities and local or regional authorities. The results will be shared with all stakeholders, other local / regional / national authorities through dissemination.

5. Market Research and Analysis

The following chapter discusses general trends that are critical for understanding ENFORCE's approach to sustainability and environmental compliance. These trends provide a broader context for ENFORCE's innovative methods and goals. Moving forward, specific market-focused discussions on environmental data trends will be developed collaboratively with project partners. This approach ensures that the trends align with partners' needs and support exploitation activities effectively, as outlined in the ENFORCE proposal. This collaborative refinement will guide which market trends are most useful for the project's impact and scalability.

ENFORCE is well positioned to address the growing challenges of sustainability and environmental compliance through its innovative approach. By leveraging citizen science, co-created methodologies, and advanced tools for environmental compliance, ENFORCE aims to provide scalable and cost-effective solutions that align with current market demands.

The project introduces **Environmental Compliance Data Readiness Levels (EC-DRL)** as a progressive framework for validating and certifying environmental data, ensuring its quality and suitability for regulatory and compliance purposes.

ENFORCE's **Living Lab approach** promotes collaboration among stakeholders, enabling co-creation of evidence and solutions that empower citizens while supporting authorities in monitoring, detecting, and enforcing compliance. This focus on citizen engagement and innovation responds directly to the need for more efficient and transparent compliance mechanisms in both public and private sectors.

The project aligns with three key market demands:

1. **Sustainability Compliance and Reporting**: With increased regulatory pressure and consumer demand for transparency, tools like EC-DRL can help organizations ensure adherence to environmental laws and improve reporting.

2. **Citizen Science as a Scalable Framework**: By utilizing citizen-collected data, ENFORCE offers a cost-effective and inclusive solution for environmental monitoring, appealing to a wide range of stakeholders.

3. **Integration with IT and AI Solutions**: ENFORCE outputs are designed to integrate seamlessly with IT and AI strategies, addressing challenges such as data quality, scalability, and carbon efficiency.

5.1. Market Trends

Sustainability is gaining tremendous traction among European organizations driving them to reshape their mindset and strategies. Legislations that the European Commission is putting in place, along with incentives (e.g., Next Generation EU funds[5]), are encouraging organizations to make their businesses more sustainable.

Sustainability market can be divided into three main dimensions that reflect the fundamental pillars of sustainable development:

- **Environmental (E),** which incorporates technologies, policies, and practices that mitigate environmental impact and optimize the use of natural resources (such as renewable energy, biodiversity conservation, water and waste management, etc.);
- **Social (S),** related to social justice, community impact, and human well-being; and
- **Governance (G),** referring to corporate practices that ensure transparency, business ethics, and regulatory compliance.

The sustainability market in Western Europe is experiencing significant growth, driven by regulatory pressures, consumer demand, and corporate commitments to ESG goals. European CIOs prioritize environmental sustainability, with investments in IT operations to reduce carbon emissions and enhance energy efficiency. IDC's research indicates that sustainability-related IT spending in Europe is expected to reach nearly $100 billion by 2025, reflecting the increasing integration of sustainability into business operations and the adoption of advanced technologies to support these initiatives[6].Additionally, according to IDC data, 72% of boards of directors of organizations in Europe state that sustainability is one of the top three investment priorities[7].

To understand the dynamics of this market, its structure can be analysed by sectors where sustainability is playing a key role, as well as horizontal capabilities that are fostering the development and promotion of sustainability in organizations (emerging technologies such as IoT for sustainability, AI applied to resource optimization or Blockchain for traceability of sustainable products; regulations and certifications, such as the EU Green Taxonomy[8], or certifications such as LEED[9], BREEAM[10], and Global Reporting Initiative (GRI)[11]; and sustainable investments and finance, such as ESG funds (environmental, social, and governance) or green bonds[12] and climate bonds[13]).

[5] NextGenerationEU: for a stronger, more resilient Europe - European Union
[6] Sustainability Remains a Key Goal for European CIOs Despite Economic Pressures
[7] Key Sustainability Trends and Developments in EMEA, 2024
[8] La taxonomía verde europea, ¿qué es y por qué es importante? - Comisión Europea
[9] LEED rating system | U.S. Green Building Council
[10] BREEAM®. El Certificado de Construcción Sostenible
[11] GRI - Home
[12] What Are Green Bonds?
[13] Climate Bonds Initiative | Mobilizing debt capital markets for climate change solutions

Regarding the sectors, the following stand out:

Energy: Generation and management of renewable energies (solar, wind, green hydrogen). In this sense, renewable energy generation accounted for 47% of electricity production in the EU in 2024, with significant investments in solar and wind energy. Furthermore, the share of renewable energy in the EU's electricity generation increased from 34% in 2019 to 47% in 2024. This increase is mainly due to the growth of solar and wind energy. Solar energy generated 11% of electricity in 2024, surpassing coal for the first time[14].

Sustainable Mobility: Electric vehicles (EV), charging infrastructure, sustainable public transport. Projections suggest that electric vehicles (EV) will make up between 20% and 24% of the European automotive market by 2025. According to Transport & Environment (T&E), EVs are expected to achieve a 24% market share in 2025, driven by increased sales to meet EU emission targets[15].
On the other hand, an analysis by *Intotheminds* forecasts that the market share of electric vehicles in Europe will be 23% in 2025[16]. These projections indicate significant growth in EV adoption in Europe by 2025.

Agriculture and Food: Regenerative agriculture, fertilization efficiency, sustainable food production. The adoption of sustainable agricultural practices is increasing, driven by policies such as the "Farm to Fork[17]" Strategy of the European Green Deal. The global regenerative agriculture market has been growing at a compound annual growth rate (CAGR) of 14% since 2022[18] and is expected to reach $9.38 billion by 2025, with a similar growth projection (14%) leading to a potential market size of €18.07 billion by 2030. The European organic food and beverage market is growing at a CAGR of 14.15%[19], with the European Commission providing funding to promote sustainable and high-quality agri-food products both at the EU and global levels[20].

Construction and Building: Green infrastructure, sustainable buildings, use of recycled materials. The European sustainable building market is expected to grow at a CAGR of 11.04% from 2023 to 2029[21], like the market for sustainable construction materials, which, although growing at a slightly lower rate (10.6%[22]), continues to follow the growth trend of this industry. Additionally, regarding the use of recycled plastics, market growth is expected with a CAGR of 3.5% from 2022 to 2030, reaching $15.137 billion by 2030[23]. Finally, regarding construction and

[14] https://unfccc.int/es/process-and-meetings/the-paris-agreement/el-pacto-de-glasgow-para-el-clima-principales-resultados-de-la-cop26
[15] Coches eléctricos: perspectivas para 2025 en Europa
[16] https://www.intotheminds.com/blog/es/perspectivas-coche-electrico-2025-europa/
[17] Farm to Fork Strategy - European Commission
[18] https://www.theinsightpartners.com/es/reports/europe-recycled-plastics-market
[19] https://www.mordorintelligence.com/es/industry-reports/organic-food-and-beverages-market
[20] https://ec.europa.eu/commission/presscorner/detail/en/ip_24_6421
[21] https://www.mordorintelligence.com/es/industry-reports/europe-green-buildings-market
[22] https://www.vantagemarketresearch.com/es/industry-report/construction-sustainable-materials-market
[23] https://www.theinsightpartners.com/es/reports/europe-recycled-plastics-market

demolition waste (CDW), according to the European Recycling Industries Confederation[24], 83% of CDW in the EU is potentially recyclable, and 16% can be reused, indicating a large potential for using recycled materials in construction.

Waste Management and Circular Economy: Advanced recycling, reuse, and composting systems. Regarding waste management, the European market is expected to grow at a CAGR of 3.7% from 2022 to 2030, reaching $188.28 billion. Much of the market growth is driven by the increasing amount of waste treated in the EU (around 2,000 tons in 2022), which includes imported waste and excludes exports[25]. Concerning the circular economy, the European market is growing at a CAGR of 22.5% until 2030[26], driven by the implementation of circular economy practices by both public and private organizations, contributing to the segment's growth by about €42 billion over the period[27]. Regarding advanced recycling and resource reuse, the recycling services market is expected to have a CAGR of 6.1% from 2022 to 2030[28].

Water Management: The European water management market encompasses several key areas, including desalination, water efficiency, and wastewater treatment. Regarding wastewater treatment, the European market was valued at approximately $15.365 billion in 2023, with an estimated growth of 6.5% from 2023 to 2031[29]. Regarding desalination, current EU desalination plants can supply up to 2.89 billion cubic meters of desalinated water per year[30]. Of this amount, 71% is used for human consumption, 21% for industry, and only 8% for agriculture.

Technology and Digitalization: Beyond built sustainability business services, it is focused on software and hardware for emissions monitoring, and sustainable data platforms.

As organizations continue to push for innovation around their operations and strategy, sustainability spending continues to be a high priority as the initial steps to beginning a sustainable transformation can be daunting to those organizations that have not attempted anything similar in the past. This innovation is beginning to be driven by three main technologies: *cloud, generative AI, and IoT technologies*.

These are set to significantly impact sustainability-related spending by consumers of professional services. Cloud and Generative AI can manage, store, and analyze vast amounts of data to provide insights and predictive analytics, optimizing supply chains, reducing waste, and enhancing resource management by identifying patterns and recommending improvements.

AI-powered tools also enable organizations to model and simulate the environmental impact of different strategies, helping them choose the most sustainable options. Meanwhile, IoT technologies offer real-time

[24] https://www.residuosprofesional.com/residuos-de-construccion-ue-podrian-reciclar
[25] https://www.europarl.europa.eu/topics/es/article/20180328STO00751/el-trabajo-de-la-ue-para-la-gestion-sostenible-de-residuos
[26] https://www.theinsightpartners.com/es/reports/europe-recycled-plastics-market
[27] Ibid
[28] https://picvisa.com/es/mercado-europeo-servicios-reciclaje-2030
[29] https://www.businessmarketinsights.com/es/reports/europe-water-treatment-system-market
[30] Worth its salt: Can desalination help address Europe's freshwater needs? | Euronews

data collection and monitoring, tracking energy usage, emissions, and resource consumption with high precision. This continuous data flow supports more effective and responsive sustainability practices, such as optimizing energy consumption in buildings and ensuring sustainable logistics operations. As these technologies become more integrated into business operations, consumers of professional services are likely to increase their spending on AI and IoT solutions that promote sustainability, recognizing the long-term cost savings and environmental benefits and driving a shift toward more sustainable and data-driven business models.

Specifically, the scope of the tools and solutions being developed within the ENFORCE project (Plaza, apps, etc.) aligns with current market trends. Specifically, in the described technologies (cloud, IoT, AI, and business intelligence), the market in Europe for the 2025-2028 period is projected to reach €86.553 billion, growing at a CAGR of 15.44% during that period[31].

Breaking it down by categories, in the IoT segment relevant to the ENFORCE project (analytics software, application software, and IoT platforms), this market will grow at a rate of 11.01% during the 2025-2028 period, reaching €42.588 billion. In this context, analytics software development will grow by 19.5% year-over-year (YoY), while application software will see an 11.4% YoY growth. IoT platforms, in turn, will grow by 13.7% YoY. Collectively, the application of this technology to address sustainability challenges across various industries emerges as an essential instrument[32].

[31] Worldwide Internet of Things Spending Guide
[32] Ibid

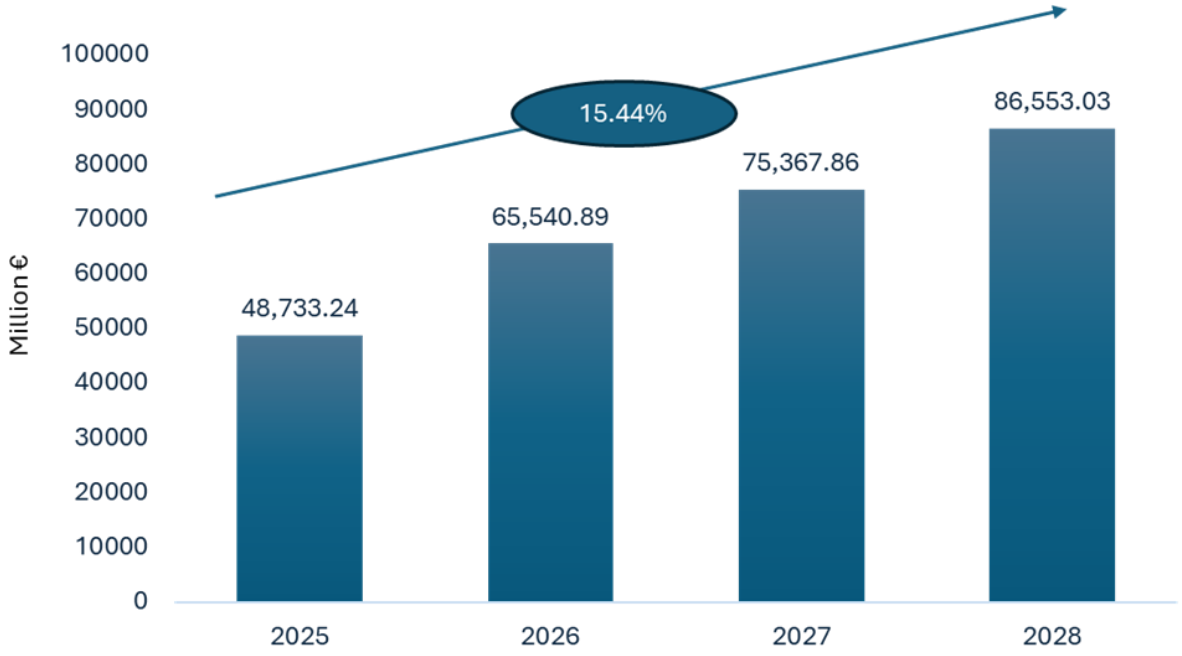


Figure 10 Market size for digital technologies for ENFORCE project. Source: Worldwide Digital Transformation Spending Guide, IDC. 2024

Regarding the use of AI and generative AI to tackle challenges arising from the ENFORCE project, the market shows growth that will reach €25.142 billion during the 2025-2028 period, representing a sustained YoY growth rate of 20.08% and a CAGR of 19.03% for the period. In this category, the development of Advanced and Predictive Analytics Tools stands out, with the market expected to reach €1.539 billion in 2025 and grow at a CAGR of 11.3% from 2025 to 2028. Similarly, AI Software Platforms are expected to reach a market size of €4.604 billion in 2025, with sustainable growth during the cited period of 39.1%, reaching €12.402 billion by 2028.

In conclusion, a preliminary analysis of market trends and key figures highlights how the various outcomes of the project (tools, solutions, applications, as well as the ENFORCE Plaza hub) align with market dynamics and present opportunities for subsequent exploitation and development.

However, as AI use increases, organizations will need to carefully manage the trade-off between leveraging AI for sustainability and mitigating its increasing contribution to IT's carbon footprint. Consequently, efficiency has become a "de facto" in every organization's strategy. Within this context, IDC predicted that by 2027, 75% of customers will multiply their IT infrastructure efficiency and cost-effectiveness by leveraging various FinOps and GreenOps instruments. FinOps and GreenOps approaches have never been more necessary to improve visibility and governance of the enterprise's IT infrastructure as AI and associated infrastructure build-up (and, to a greater extent, GenAI) is transforming organizations' strategies and contributing to increased costs and carbon emissions.

Analyzing the global sustainability market in Europe and aligning it with the main action pillars of the Green Deal Data Space[33], the potential market for developing actions within the ENFORCE project is shown in the figure below.

The European market for solutions related to consumption optimization, sustainable resource management, sustainable infrastructure, sustainability tracking auditing representation, tracking and reporting of CO2 emissions[34], as well as optimization/resource management, is growing at a rate of 15.3% during the period 2025-2030

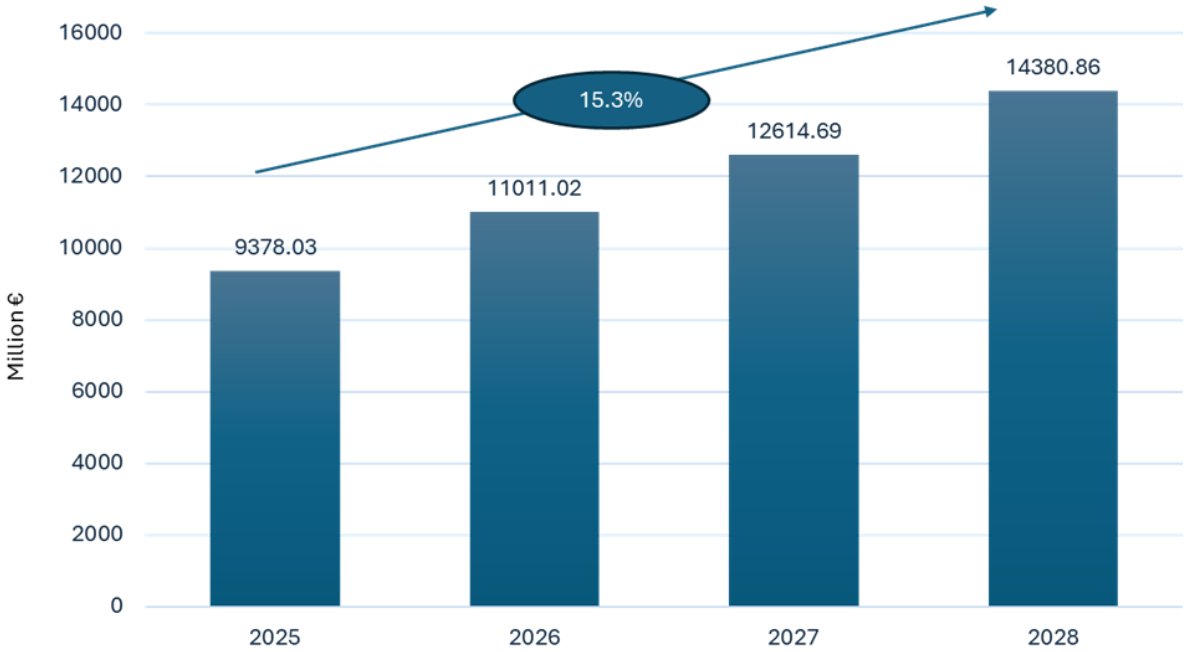


Figure 11 European Sustainability Market - use cases aligned with Green Deal Data Space. Source: Worldwide Digital Spending Guide, IDC – Use Case forecast. 2024

As we move into an era of mandatory ESG reporting, the demand for sustainability professional services is poised to grow exponentially. Organizations are not only driven by regulatory compliance but also by a heightened awareness of the intrinsic value that sustainability brings to enterprise performance and risk mitigation. Shortly, we will see a significant shift toward integrated, holistic sustainability strategies supported by advanced technologies like AI and IoT. These innovations will drive efficiency and accuracy in reporting while uncovering new opportunities for sustainable growth. The professional services market will need to evolve rapidly to meet these demands, offering more specialized and nuanced solutions that address both environmental and social impacts.

[33] www.greatproject.eu
[34] Worldwide Digital Transformation Spending Guide

Technology vendors are under pressure to address European and country-specific regulations and directives while substantiating their sustainability credentials and helping their customers achieve their sustainability goals. These include:

EU Corporate Sustainability Reporting Directive (CSRD). The CSRD includes stringent and explicit criteria (like financial reporting) on the form and processes of sustainability and ESG reporting in the EU. The CSRD came into force in January 2023 and mandates a phased implementation, with a first set of large, listed organizations required to report according to the 12 European Sustainability Reporting Standards (ESRS) as early as 2025 for their FY 2024.

Originally, CSRD was to be followed in June 2024 by sector-specific standards and standards for third-country companies having at least one subsidiary or branch in the EU. The implementation of industry-specific standards was delayed to June 2026 to reduce reporting burdens for companies and focus on implementing the current ESRS. The date of application for third-country companies remains FY 2028.

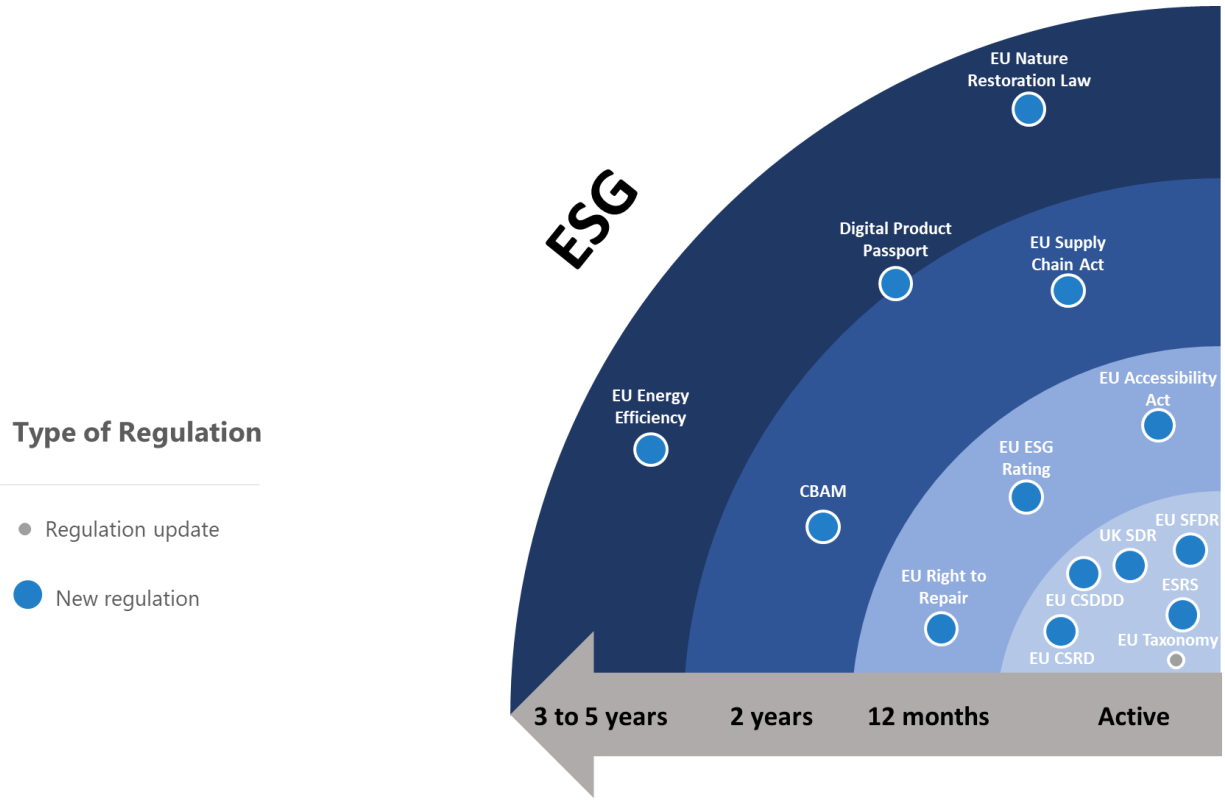
European Sustainability Reporting Standards (ESRS). It requires companies to report on sustainability-related impacts, opportunities, and risks under the EU CSRD. It provides information for investors to understand the sustainability impact of the companies in which they invest. The ESRS considers the International Sustainability Standards Board (ISSB) and the Global Reporting Initiative (GRI) to ensure reliability and unnecessary double reporting by companies.

EU Sustainable Finance Disclosure Regulation (SFDR). Entered into force on March 10th, 2021, it imposes mandatory environmental, social, and governance (ESG) disclosure obligations for asset managers and other financial markets. It aims to bring transparency for financial market participants and financial advisers in relation to sustainability risks, sustainability impacts in their investment processes, and the provision of sustainability-related information with respect to financial products.

EU Corporate Sustainability Due Diligence Directive (CSDDD). The CSDDD sets out corporate due diligence obligations. It requires relevant companies to identify, prevent, and mitigate potential or actual adverse human rights and environmental impacts connected with their operations, including both upstream and certain downstream impacts. It also seeks to provide access to grievance mechanisms and legal remedies for those affected by violations of CSDDD provisions. The CSDDD entered into force on July 25th, 2024.

UK Sustainability Disclosure Requirements (SDR). Is a set of regulations to improve trust and transparency in the sustainability investment fund market. It includes an anti-greenwashing rule and additional rules regarding sustainable investing for the UK. The current UK SDR is only applicable to UK-domiciled funds. However, guidance on overseas funds, such as undertaking for collective investment in transferable securities (UCITS) funds domiciled in the European Union (EU), is expected in 2024. Other elements of the UK SDR related to firms and products will come into effect over the course of 2024 and the next couple of years.

Other regulations. To learn more about existing or upcoming regulations and policies in EMEA, please refer to the figure below and *EMEA Digital Regulations and Policies Radar – 2024 Update* (IDC #EUR152325424, June 2024[35].



Beyond European regulations, the cloud is now seen as a solution to address sustainability targets through optimization practices that enable organizations to make them more effective and, consequently, reduce both environmental impact and cloud costs. However, valuable and reliable data is needed to better understand organizations' GHG emissions and costs. However, calculating and measuring data may be difficult, especially data derived from Scope 3 emissions, which usually represent 80–85% of total energy emissions.

On the other side, consumption from computing, memory, and storage is generally easier to measure and represents a good proxy for emissions. Cost is also a proxy for emissions, but it is not as efficient as consumption. Therefore, it is important to understand how emissions are measured, and which metrics are included and excluded.

[35] EMEA Digital Regulations and Policies Radar — 2024 Update

The two primary methods are:

I. **Location-based emissions**. Refers to the GHG emissions directly associated with the average energy mix of the grid where the electricity consumption occurs. This method considers the physical location and the energy grid's average emission factor, representing the mix of energy sources used to generate electricity (e.g., coal, natural gas, renewables) in a specific geographic area.

II. **Market-based emissions**. Refers to direct and indirect emissions from consuming products and services. They are calculated based on the specific contracts or instruments that a company uses to procure electricity, such as Renewable Energy Certificates (RECs), Guarantees of Origin (GOs), or Power Purchase Agreements (PPAs). This method reflects the choices made by a company to support renewable energy or low-carbon power sources, regardless of the average grid emissions.

Applying a location-based emission approach is suitable for companies with high renewable energy penetration in the grid or where specific energy procurement strategies are not in place. On the other side, market-based emissions is ideal for companies actively engaging in renewable energy procurement, aiming to demonstrate leadership in sustainability. The Greenhouse Gas Protocol requires organizations to report both methods for Scope 2 (indirect emissions from electricity consumption). This dual reporting approach provides a comprehensive view of an organization's energy use and its efforts to reduce emissions. However, different regions and industries may have different requirements for reporting GHG emissions. For example, the EU Emissions Trading System (EU ETS) encourages the use of market-based mechanisms to reduce emissions and supports the purchase of RECs and GOs.

Scope 3 emissions are not directly affected by these two methodologies, unless a supplier has chosen to use market-based emissions in their calculations for usage.

To calculate Scope 3 emissions, organizations should first collect primary data from their value chain partners (e.g., suppliers, distributors) as these data are specific to organizations' operations and provide the most accurate representation of emissions. Working closely with suppliers will be critical to gather data.
When primary data are not available, organizations should use secondary data derived from industry averages, emissions factors, or data from life cycle assessments (LCAs). These data can provide reasonable estimates for emissions but may be less accurate.

Calculating Scope 3 emissions is a complex but essential part of a comprehensive GHG inventory. By understanding your value chain, gathering accurate data, and using the right tools, organizations can effectively measure and manage their emissions.

5.2. The market context underscores the importance of ENFORCE's objectives:

- **Data Validation and Certification**: The EC-DRL framework provides a reliable mechanism to validate and certify data, addressing the growing need for cost-effective and accurate compliance tools.

- **Citizen Science as a Market Enabler**: ENFORCE's use of citizen science reduces costs and increases community involvement, offering organizations a scalable and inclusive way to meet compliance requirements.

- **Integration with Broader IT Trends**: ENFORCE's outputs can integrate with cloud and AI-driven sustainability strategies, contributing to reduced carbon emissions and improved data efficiency.

By addressing these challenges, ENFORCE not only meets regulatory demands but also positions itself as a key player in a growing market for innovative sustainability solutions. This unique approach enables public authorities, environmental agencies, and private organizations to optimize their operations while achieving environmental goals.

6. Intellectual Property Rights Strategy

Intellectual property ("IP") management plays an essential part in the entire lifecycle of research and innovation projects funded by the European Commission's Horizon Programme, and Regulation (EU) 2021/695 establishing Horizon Europe – the Framework Programme for Research and Innovation[36] encourage ENFORCE participants to make use of the relevant existing applicable legal instruments in both protecting and exploiting their IPRs. Article 39 of the Regulation requires EU-funded projects to disseminate results and to grant open access to the research outputs in compliance with the applicable EU IP laws. Therefore, it is appropriate to consider the protection generally available to various intellectual property assets within the context of ENFORCE.

The ENFORCE IPR strategy is aligned with the European Commission (EC) and national policies regarding intellectual property (IP) ownership and exploitation, carefully considering confidentiality and other relevant aspects. All consortium partners contribute background IP and know-how without additional costs, retaining ownership of their respective contributions. The Consortium Agreement, structured on the latest DESCA template, is signed by all partners before the project's commencement.

[36] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1291/2013, OJ L 170/1.

6.1. Relevant IP assets

There are numerous mechanisms for protecting one's intellectual property, including copyrights, trademarks, designs, patents, trade secrets, and various 'sui generis' rights (note that this indicative list is by no means exhaustive).

This section focuses on the legal protection available to data and software as these are mainly the two IP assets that will likely be present in the context of the operation of ENFORCE (data, software, and tools). In particular, the discussion focuses on data generated or collected by ENFORCE participants, and proprietary code or software used by ENFORCE participants with data collected or generated by the participants to, for example, create datasets compatible with the platform structure.

By contrast, this section does not consider legal protection for any ENFORCE participants' existing IP assets, to the extent such IP assets do not fall within a participant's background for regimes, they are not necessarily assets that are envisaged to be transferred to or shared with other participants, via ENFORCE plaza, so they fall outside the scope of this deliverable. Such IP assets include, for example, individual ENFORCE participants' proprietary copyright materials, their proprietary software, trademarks, patents, trade secrets, or any third-party software used by or licensed to an ENFORCE participant for, or during, carrying out their business, all outside of the context of ENFORCE.

6.2. Contractual IP Framework

ENFORCE project is governed by two key legal documents. The Grant Agreement ("GA") governs the relationship between the project's participants and the EU (represented by the European Commission as the granting authority), whilst the Consortium Agreement ("CA") governs the relationships amongst individual participants within the project. Both GA and CA are complementary in governing the approach to the protection and exploitation of intellectual property rights in ENFORCE.

The principles for managing IPR in ENFORCE are included specifically in the legal document Consortium Agreement ("CA") and are detailed in:

- Chapter 4: RIGHTS AND OBLIGATIONS OF THE PARTIES
- Chapter 3: RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND AND RESULTS.

The GA and CA distinguish between and address three categories of assets, namely i) background information, ii) results, and iii) software. The essential legal principles are discussed below.

Background information

According to the GA, ENFORCE participants are required to identify any background information held by them that is needed for implementing the project[37]. Background information entails any information, or materials, including those that are subject to IP protection, that were held by the

[37] ENFORCE Consortium, Grant Agreement, cl. 16.1

participants before accession to the Grant Agreement ("GA") and that are needed to implement that action of exploiting the results.

ENFORCE participants are expected to grant each other – on a royalty-free basis – access to the background needed to implement their tasks under the action unless such background is subject to restrictions or cannot be disclosed on a royalty-free basis[38]. Likewise, ENFORCE participants are expected to grant each other access – under fair and reasonable conditions – to the background needed for exploiting the results, unless the background is subject to restrictions. ENFORCE participants have already identified their respective background information in the CA and have also, where relevant, informed each other of the legal restrictions and limits to which access rights to background information are subject[39].

Results

According to the GA and CA, each ENFORCE participant retains ownership of the results they obtain or generate in the context of the project; in other words, no EU institution obtains ownership of such results[40]. "Results" are defined widely and include any tangible or intangible effect of the project, including any data, information or know-how[41].

Where two or more participants have jointly generated certain results and it is not possible to establish the respective contribution of each participant or separate the results to apply for IP protection, then those results shall be held jointly by those participants. In those cases, owners are required to agree in writing on the terms of their joint ownership (though the CA lays down rules where such an agreement is absent). Unless agreed otherwise, each joint owner may grant non-exclusive licenses to third parties to exploit the jointly owned material, subject to service of advance notice on the other parties, and provision of fair and reasonable compensation[42].

Further, ENFORCE participants are generally obliged to grant access to their results – on a royalty-free basis – to the granting authority, EU institutions, bodies, offices, or agencies for developing, implementing, and monitoring EU policies or programmes[43]. Such access rights do not extend to any background information and are limited to non-commercial and non-competitive use, and the granting authority may use non-sensitive information and material received from ENFORCE participants for a wide range of purposes, including, for its purposes, distribution to the public, and the production of derivative works[44].

ENFORCE participants also are required to use their best efforts to exploit the results directly or to have them exploited indirectly by another entity, especially through licensing or transfer of ownership. It is worth noting that each participant may grant licenses to third parties (including

[38] ENFORCE Consortium, Grant Agreement, cl. 16.1, Annex 5
[39] ENFORCE Consortium, Consortium Agreement, Attachment 1
[40] ENFORCE Consortium, Grant Agreement, cl. 16.2; ENFORCE Consortium Agreement, cl. 8.1
[41] ENFORCE Consortium, Grant Agreement, cl. 16.2
[42] ENFORCE Consortium, Consortium Agreement, cl. 8.2
[43] ENFORCE Consortium, Grant Agreement, Annex 5
[44] ENFORCE Consortium, Grant Agreement, cl. 16.3

exclusive licenses), but the granting authority has reserved the right to object to such licensing (subject to a formal notification procedure laid down in the GA)[45].

Software

ENFORCE participants have also agreed with certain specific provisions addressing their access rights to other participants' software. These provisions cover both software brought by a participant as background as well as software developed as a result of the project. Any ENFORCE participant is expected to have access to other participants' software that has been identified as background, in its object-code form (i.e. in its machine-readable form), unless otherwise agreed in writing between the participants concerned.

6.3. EU Legal Framework for IP

The previous section outlined the contractual framework for protecting various IP assets created in the context of ENFORCE. It discussed the applicable rules that various parties have agreed among themselves in disclosing, using, licensing or transferring IP assets amongst themselves.
This section sets out the key principles that apply to legal protection of data and software, as the two most relevant forms of IP in the context of ENFORCE. Those legal principles apply in general, i.e., even absent any contract or other arrangements between the relevant parties.
It is worth noting that these two sections are complementary. In other words, IP assets created and used in the context of ENFORCE will be subject to certain legal protections under both the GA and CA, as well as certain generally applicable mechanisms outlined in this section.

6.3.1. Data

ENFORCE aims to co-create a pan-European collaboration and innovation hub to mainstream the use of citizen science for environmental compliance assurance. Data therefore plays a key role in the project. As a result, it is important to consider how data is protected under applicable EU laws, i.e. what protection and exploitation mechanisms ENFORCE participants may rely upon in the absence of any further legal arrangements.
In general, any fixed or recorded intellectual creation of the human mind may be protected by copyright and its author may rely on a series of exclusive rights in respect of their works. As a result, parts of a database that fulfil these criteria may be copyrightable. It should be noted, however, that although recorded in a fixed form, raw data is usually not considered an intellectual creation of the human mind, so it will not generally be subject to copyright protection.

However, data in a certain form or organized in a certain way may acquire legal protection. More specifically, the Database Directive[46] grants copyright protection to "*collection[s] of independent works, data or other materials arranged systematically or methodically and individually accessible*

[45] ENFORCE Consortium, Grant Agreement, Annex 5
[46] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases

by electronic or other means"[47], in other words, data selected and arranged by an author as their own intellectual creation. Legal protection under these 'sui generis' database rights does not extend to computer programmes (as those may be protected under other IP regimes, such as copyright or patent law)[48]. Note, importantly, that copyright protection under the Database Directive only covers the structure of the database (i.e. the selection of arrangements of its contents) but does not extend to its contents (i.e. the data itself)[49].

If the database is in a fixed form, then the Database Directive grants its maker several exclusive rights, including the right to carry out a temporary or permanent reproduction of the database or its part, translation or adaptation, and distribution to the public to the database or its copies[50]. At the same time, the maker has the right to authorize another party to carry out any of the maker's exclusive rights. The Directive also stipulates that permission is not required for extracting and/or re-utilizing insubstantial parts of the contents of a publicly available protected database, provided that such use does not unreasonably prejudice the legitimate interest of the maker[51]. Furthermore, the use of a substantial part of a publicly available protected database for teaching or scientific research purposes is allowed if the source is indicated and to the extent justified by the non-commercial purpose to be achieved[52].

To enable the maker of a database to benefit from these rights, the maker must be able to show they have made a substantial investment in either the obtaining, verification, or presentation of the contents to prevent extraction and/or re-utilization of the whole or of a substantial part of the contents of that database[53]. If the criteria for protection are met, then the database benefits from a 15-year protection term[54].

It is envisaged that ENFORCE participants' data is collected as raw data but will most likely be organized and arranged systematically and methodically to enable its efficient processing by the relevant participant. The systematic methodical arrangement will also facilitate the efficient reuse of the data by other participants. Therefore, it is likely that such collection and arrangement of data will be carried out by the participants "as their own intellectual creation", so the datasets (unlike individual records of data) will likely be eligible for protection under the Database Directive.

It is worth noting that the European Commission's proposal for the Data Act[55] will likely have an impact on sui generis protection of databases. The proposal suggests that the sui generis database

[47] Ibid., Article 1 (2)
[48] Database Directive, Article 1 (3)
[49] Ibid., Article 3
[50] Ibid., Article 5
[51] Ibid., Article 8 (1)
[52] Ibid., Article 9
[53] Database Directive, Article 7 (1)
[54] Ibid., Article 10
[55] COM(2022) 68 final: Proposal for a Regulation of the European Parliament and of the Council on harmonized rules on fair access to and use of Data (Data Act)

right will not apply to databases containing data generated or obtained from the use of the Internet of Things (IoT) or related services[56]. The main reason for this is that the proposal aims to ensure that the sui generis database right will not prevent consumers and businesses from accessing and reusing data generated from their respective IoT devices. Although this restriction to the scope of sui generis will facilitate data sharing and have a positive impact on the uniform application of rules in the internal market and for the data economy, it will naturally also lower the scope of the legal protection of their datasets that ENFORCE participants can rely on.

Finally, ENFORCE participants may also be able to rely on the protection of their data as trade secrets, provided they fall within the scope of the definition of trade secrets under the Trade Secrets Directive[57]. For this, the data must have the following qualities: (1) it must be secret in the sense that it is not generally known among, or readily accessible to, persons within the circles that normally deal with the kind of information in question; (2) it has commercial value because it is secret, and (3) the relevant ENFORCE participant has taken reasonable steps to keep the data secret[58]. The Directive makes any acquisition, appropriation, copying of any electronic files (including data), amongst others, or any other conduct contrary to honest commercial practices, without the consent of the trade secret holder, unlawful[59]. ENFORCE participants who can show that their data satisfies the above conditions will therefore be able to rely on this protection. Conversely, data that may constitute a trade secret may be lawfully acquired by anyone under certain circumstances, such as during their independent discovery or creation, or observation or study[60]. As a result, a ENFORCE participant will not be able to prevent another party from acquiring and using an identical or similar dataset which the other party has obtained independently, such as through their own data gathering; in other words, any participant will be able to exploit data and its value through their own independent gathering.

6.3.2. Software (Code)

An analysis of legal protection available to code or software may be relevant for ENFORCE concerning (1) any software used in the operation of ENFORCE Plaza, and (2) any software or app that may be used and shared by a participant in connection with the data shared via the platform to facilitate more efficient utilization of the data.

In the EU, the Computer Programs Directive[61] requires Member States to ensure that computer programmes are protected as literary works, if they are deemed original in the sense that they are the author's intellectual creation[62]. Although the Directive does not provide much guidance on the scope of the definition of a "computer programme", EU case law has accepted a wide scope of the

[56] Ibid., Article 34
[57] Directive (EU) 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure
[58] Directive (EU) 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information trade (trade secrets), against their unlawful acquisition, use, and disclosure, Article 2 (1)
[59] Ibid., Article 4 (2)
[60] Ibid., Article 3 (1)
[61] Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs
[62] Ibid., Article 1 (1)

definition, including software, AI models or code of a computer programme in any form including the preparatory design material, machine code, source code and object code[63].

To qualify for copyright protection as a literary work, software, or code that it consists of must – amongst other criteria – be expressed and fixed in some material form; copyright protection does not extend to ideas[64].

If the software is copyrightable, then its owner may rely on certain exclusive rights granted to such works. For example, a copyright holder has an exclusive right to reproduce the work[65], communicate it to the public[66], or make an adaptation of the work[67]. At the same time, the copyright owner may authorize others to use the protected work.

Copyright owner may be a natural as well as a legal person. Although copyright arises automatically on creation and fixation of the work and is by default held by the author, software developed in the course of employment would in practice typically be contractually assigned by an employee to their employer.

The directive also permits the use of code without prior authorization from the rights-holder where reproduction of the code and translation of its form are essential to obtain information necessary to achieve the interoperability of a new computer program with other programs. However, such reproduction is only permissible where (1) the person carrying out the reproduction is authorized to use the code lawfully; (2) the information on interoperability has not previously been readily available; and (3) the reproduction only occurs with respect to the parts of the original program with are necessary to achieve interoperability.
As far as ENFORCE participants' software is concerned, it will generally likely be protected under the Directive. As a result, the relevant software makers will be able to rely on the protection of their software under the copyright rules applicable to literary works, provided their software fulfils the relevant criteria. Each such software maker will therefore have an exclusive right to authorize anyone else to use their respective software. Further assessment of individual software and its conformity with the copyright protectability criteria falls outside the scope of this deliverable.

Finally, it is worth noting that software may also be granted patent protection, subject to meeting certain strict patentability criteria. Patents grant their registered holders time-limited exclusive rights over their inventions in exchange for public disclosure of those inventions. Patents are territorial, meaning that they apply only in a specific geographic area, whilst patentability criteria and the decision-making of patent registries and courts vary from jurisdiction to jurisdiction.

[63] Case C-406/10 SAS Institute
[64] Computer Programs Directive, Article 1(2); Berne Convention for the Protection of Literary and Artistic Works, Article 2 (2)
[65] Berne Convention for the Protection of Literary and Artistic Works, Article 9 (1)
[66] Ibid., Article 11bis (1)
[67] Ibid., Article 12

Within the EU, "programs for computers" are generally excluded from patentability[68], to the extent that a patent application relates to a computer program "as such"[69]. Computer programmes that make a non-obvious "technical contribution" or solve a "technical problem" in a non-obvious way will be patentable. Given these strict criteria for software patentability, ENFORCE participants' software will only be patentable if they have such a positive material technical effect. Establishing this generally proves challenging and any patentability assessment of specific software falls outside the scope of this deliverable.

6.4. Free and open-source software

In the scope of the project, various participants within ENFORCE will or may use software licensed under certain open-source licenses. It is therefore appropriate to briefly outline the key features of open-source licensing, lay down the key differences between the two main categories of open-source licenses, and discuss how such licenses may impact the exploitation of software used in the context of ENFORCE. For completeness, this section also briefly considers "public domain" and Creative Commons licensing as alternative regimes to open-source licensing.

6.4.1. EU Open-Source Software Strategy

Open-source licensing of software in the context of ENFORCE can be evaluated considering the European Commission's Open-Source Strategy 2020-2023[70]. By publishing its strategy – which supports the Commission's goals of the overarching Digital Strategy[71] - the Commission further encourages and leverages the transformative, innovative, and collaborative potential of open source. In particular, and amongst other goals and outcomes, the strategy aims to encourage the sharing and reuse of software and applications, as well as data, information, and knowledge[72]. The concrete actions that the Commission intends to focus on in achieving its aims include setting up its Open-Source Programme Office, enhancing the software repository, revising software distribution practices, and ensuring open-source software security[73].

In this regard, the Open-Source Strategy has been published in the form of a communication from the Commission. As such, it should be read as a policy document with no mandatory authority, unlike regulations or directives. However, it is no less relevant as it outlines the Commission's views and long-term aims and serves as a reliable indicator of fields and issues where further legal developments may occur.

[68] European Patent Convention, Article 52 (2)
[69] Ibid., Article 52 (3)
[70] C(2020) 7149 final: Communication to the Commission: Open Source Software Strategy 2020-2023: Think Open
[71] C(2022) 4388 final: Communication to the Commission: European Commission Digital Strategy: Next Generation digital Commission
[72] Open Source Software Strategy 2020-2023, section 4.3
[73] Ibid., section 6.4

6.4.2. Open-Source Licensing

In brief, open-source licenses allow for software to be freely used, modified, and shared.
To date, the Open-Source Initiative ("OSI") has approved tens of unique licenses allowing various degrees of free use, modification, and sharing. However, according to OSI's commonly accepted definition of open-source, the following conditions have to be met: (1) work has to allow free redistribution, (2) source code has to be made available, (3) it must be possible to create new software based on the source code, (4) there must be no limitations on who may use the work and for what purpose, (5) the work must not require an additional license on top of the one it comes with, and (6) the license must not depend on a specific distribution format, technology or presence of other works[74].

It should be noted that the requirement of "free distribution" is not intended to mean "free" in a monetary sense but rather in the sense of generally available access to the code and no limitations in its redistribution. Having said this, code based on or incorporating open-source code may be sold for monetary consideration.

Generally, open-source licenses can be categorized as 'copyleft' or 'permissive'. Copyleft licenses (such as GNU General Public License now in its version 3 (GPLv3), Lesser General Public License (LGPL), Mozilla Public License (MPL) or Affero License (AGPL)) require derivative software to be made available alongside its source code under a copyleft license. On the other hand, permissive (such as Berkeley Software Distribution (BSD), MIT License (MIT), or Apache License (Apache)) do not have this requirement, so derivative code can be used in proprietary software licensed under commercial license terms. Each category consists of license types with stronger terms and those with weaker terms, as well as those aimed at specific contexts, which is why analysis of the relevant license terms are always essential.

6.4.3. Public Domain and Creative Commons Licenses

When the copyright protection term expires (i.e. after 70 years for software and 15 years for databases) the work enters the public domain, meaning that anyone may freely use it without any restrictions. Some software may be labeled with a "public domain" license. In the legal sense, this may be problematic because a copyright author cannot waive their copyright and their exclusive rights. Although other complexities arise concerning "public domain licenses" (including concerning questions around liability), for this deliverable, such licenses can be considered highly permissive licenses.

Creative Commons ("CC"), a US-based non-profit organization, has devised a widely used regime for licensing copyright works, including software. CC licensing is often seen as an alternative to open-source licensing. In essence, CC licensing allows copyright authors to attach to their works one of the six types of standard pre-defined CC license types. These are based on a combination of the following factors and obligations: (1) attribution, i.e. an obligation to credit the author ('BY'),

[74] Open Source Initiative, The Open Source Definition. Accessed on 9 Januray 2025 via https://opensource.org/osd/

(2) share-alike, i.e. an obligation to license the work under identical terms ('SA'), (3) derivatives, i.e. prohibition of creating the work in a derivative form ('ND'), and (4) commercial use, i.e. a prohibition commercial use of the new work ('NC'). Often the CC BY-SA license allowing others to remix, adapt, and build upon the original work even for commercial purposes, if they credit the original author and license their new creations under identical terms, is seen as the closest to a copyleft open-source license.

6.5. Key Takeaways for ENFORCE

The above outline of the key features of open-sourcing licensing, alongside the consideration of certain alternative licensing regimes, serves as evidence that software licensing is a highly complex field. Where ENFORCE participants wish to use/exploit an original piece of code for the development of their own, derivative, software, they must observe the relevant license terms.
For example, if the original code is licensed under GPLv3, then preparing a piece of derivative code or making derivative software is permitted, provided such resulting code or software is licensed under GPLv3[75]. By contrast, if the ENFORCE participant wishes to incorporate into their resulting code or software a piece of existing code licensed under MIT, then the resulting code may become a piece of proprietary code or software, provided that an MIT-specific copyright notice is included in all copies of the original software[76]. Expert advice should be sought where an ENFORCE participant seeks confirmation or remains unsure about proper compliance with specific software license terms.

[75] GNU General Public License, Art 5 c)
[76] MIT License, accessed on 9 January 2025 via https://mit-license.org

7. Conclusions and Next Steps

The ENFORCE project represents a significant step forward in fostering environmental compliance through innovation, collaboration, and citizen engagement. This initial exploitation plan marks the beginning of a structured approach to ensuring the project's Key Exploitable Results have a lasting impact beyond its timeline.

As sustainability becomes a pivotal factor in decision-making, ENFORCE's innovative solutions are well-positioned to capitalize on the growing demand for reliable data to drive environmental compliance. The integration of ENFORCE with initiatives such as the Green Deal Data Space will further enhance its relevance and value by opening new avenues for the adoption and exploitation of its results.

Additionally, campaigns and workshops involving public and private stakeholders will ensure that the ENFORCE use cases are disseminated widely, fostering a collaborative environment that supports co-creation and long-term adoption.

7.1. Next Steps

To ensure the successful exploitation of ENFORCE's results, several key activities will be prioritized in the coming phases:

Development and Refinement of the Exploitation Roadmap

IDC will produce a detailed roadmap that identifies exploitation activities within the project timeframe and beyond. This roadmap will incorporate time and financial considerations, including potential sources of additional investment, and provide a clear timeline for the adoption of ENFORCE's results.

Market Analysis and Business Models

A comprehensive market analysis will guide the adoption and monetization strategies for ENFORCE's KERs. Business models, including distribution channels and monetization plans, will be tailored to address market needs while ensuring sustainability and scalability.

IPR and Licensing Framework

The project will establish clear IPR and licensing schemas to safeguard the innovations developed within ENFORCE. This framework will facilitate partnerships, alliances, and agreements that enhance the exploitation potential of the project's results.

Workshops and Stakeholder Engagement

At least, two dedicated exploitation workshops will be conducted to guide partners in refining their exploitation pathways. The first workshop (year 2) will focus on aligning partners' plans and identifying opportunities for collaboration. The second workshop (year 3) will fine-tune the business models for the KERs. Additionally, a co-creation exploitation workshop with target

stakeholders will provide critical feedback and insights to optimize the adoption strategy. In addition IDC will organise specific meetings to further discuss with partners the key steps and align common understanding on the exploitation strategy. Collaboration and partners input in this activity is crucial.

Collaboration with External Initiatives

ENFORCE will actively seek collaboration opportunities with initiatives such as the Green Deal Data Space to integrate its solutions with broader environmental compliance ecosystems.

The outcomes of these next steps, including refined business models, exploitation strategies, and stakeholder feedback, will be documented in the upcoming versions of this deliverable. The comprehensive exploitation plan will ensure that ENFORCE's results are not only impactful but also sustainable, creating lasting value for environmental compliance and governance across Europe and beyond.

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