State-of-the-art sustainable energy efficiency technologies roadmap for waterborne transport towards the fit-for-55 guidance compliance

Project 101192661 - FLEETfor55

Deliverable D1.4 – RP1 Data Management plan

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Acronyms and Abbreviations	Meaning
ABS	AMERICAN MPIRO OF SIPING HELLENIC MONOPROSOPI ETAIREIA PERIORISMENIS EVTHINIS
AES	ATLANTEC ENTERPRISE SOLUTIONS GMBH
AI	Artificial Intelligence
CERTH	Centre for Research and Technology, Hellas
DMP	Data Management Plan
DNV	Det Norske Veritas
DOI	Digital Object Identifier
DST	ENTWICKLUNGSZENTRUM FUR SCHIFFSTECHNIK UND TRANSPORTSYSTEME EV
EET	Energy Efficiency Technology
EIF	European Interoperability Framework
EPS	EPSILON INTERNATIONAL LTD
EU	European Union
FAIR	Findability Accessibility Interoperability Reusability
FCSI	FINCANTIERI SI SPA
GA	Grant Agreement
GDPR	General Data Protection Regulation
HVAC	Heating, Ventilation and Air Conditioning
HYD	HYDRUS ANOTATI SYNEKTIKI MICHANIKI ETAIREIA SYMVOULON ANONYMI ETAIREIA
IMO	International Maritime Organization
IP	Intellectual Property
IRR	Internal Rate of Return
IWT	Inland Water Travel
KPI	Key Performance Indicator
MCDS	Multi-Criteria Decision Support
MDF	Metadata Description File
MGLCRL	MAGELLAN CIRCLE
NPV	Net Present Value
NTNU	NORGES TEKNISK-NATURVITENSKAPELIGE UNIVERSITET
NTUA	ETHNICON METSOVION POLYTECHNION
PDF	Portable Document Format
PID	Persistent Identifier
PNG	Portable Network Graphics
PPTX	Power Point Presentation XML
QFD	Quality Function Deployment

Acronyms and Abbreviations	Meaning
RAR	Roshal Archive
RINA	RINA SERVICES SPA
ROI	Return on Investment
RP1	Reporting Period 1
SSS	Short Sea Shipping
TIN	Technology Innovation Network
TRL	Technology Readiness Level
UC	Use Case
UoS	UNIVERSITY OF STRATHCLYDE
UPAT	PANEPISTIMIO PATRON
WML	GOUOTERMELON SYMVOULEUTIKI I.K.E.
WP	Work Package
XML	Extensible Markup Language

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Executive Summary

Deliverable 1.4 presents the first reporting period update of the FLEETfor55 Data Management Plan, based on the Initial Data Management Plan, submitted as Deliverable 1.3. The purpose of this report is to update the project's data management framework, while ensuring that the collection, handling, storage, protection, documentation and sharing of project data continue to follow the requirements of the Grant Agreement, Open Science practices and FAIR principles.

The FLEETfor55 project generates and manages a wide range of research outputs related to the assessment, integration and exploitation of Energy Efficiency Technologies for the maritime sector. These outputs include technical reports, deliverables, models, simulations, datasets, methodologies, software outputs etc. Due to the collaborative nature of the project, which consists of 21 partners from 9 different countries, plus the Technologies Innovation Network, involving multiple Work Packages and Tasks, a structured data management approach is required to support efficient internal collaboration, traceability of information, data security and future reuse of the results.

This updated DMP summarizes the main data management policies applied in the project and maps the project outputs produced up to month 18, including the completed tasks and deliverables. In this deliverable the Metadata Description File is formally introduced to the project, a structured description of deliverables and other project outputs.

In this report the FLEETfor55 repository is analysed to determine the number of files in each directory, as well as the number of files per file type. Out of a total of 1727 files, the majority (937) are in the directory of Work Package (WP3), while most of them (928) are PDF files. The report also confirms that Microsoft Teams remains the main collaborative repository for the project, while public documents are made available through the official project's website. A feature introduced in this report is the analysis of the consortium's repository, via metadata, in order to assess the distribution of files per directory in the repository and per file type.

1 Data Management Policies

In chapter 1, the most commonly adopted data management policies are presented, which are guided by the rules and regulations of the European Union. These policies, emphasize the compliance with Open-Science practices [1], as well as the FAIR Principles, regarding the Findability, Accessibility, Interoperability and Reusability of data [2].

1.1 Open Science Practices

Within the framework of the FLEETfor55 project, funded under the HORIZON-CL5-2024-D5-01 call, Open Science practices are implemented in accordance with the project's Grant Agreement (GA). Open Science practices represent an approach to research that fosters the timely and broad dissemination of scientific results, data, methodologies and tools [3]. By promoting transparency and accessibility throughout the research process, Open Science contributes significantly to the advancement of scientific knowledge and innovation.

The adoption of Open Science practices offers numerous benefits. It primarily facilitates collaboration among researchers, stakeholders and society at large, accelerating scientific progress and leading to societal benefits [4]. Furthermore, the availability of research outputs in structured and interoperable formats promotes easier access, as well as reuse, and interpretation by diverse audiences, helping to reduce linguistic and technical barriers to scientific information [4]. Open Science also extends the creation, evaluation, and dissemination of knowledge beyond traditional research communities, encouraging wider participation and engagement in scientific activities [4].

While Open Science aims to maximize the accessibility and reuse of research outputs, safeguarding Intellectual Property (IP) rights [5] and protecting sensitive information remain critical considerations and therefore the principle of “as open as possible, as closed as necessary” is key for the implementation of Open Science practices. This principle acknowledges that research data and results should be made openly available whenever feasible, while allowing justified restrictions where openness could compromise legitimate interests, including intellectual property protection, confidentiality requirements, security concerns, or the interests of project beneficiaries [3].

1.2 FAIR Principles

An important objective of this Data Management Plan (DMP) is to promote the easier discovery of scientific data, as well as convenient access and re-use when a search is conducted. For the implementation of this objective, the FAIR guiding principles are followed [6], according to which, all research objects should be Findable, Accessible, Interoperable, and Reusable. The FAIR framework consists of fifteen guiding principles [7], with the most relevant and applicable ones being incorporated into the DMP.

An important objective of this Data Management Plan (DMP) is to promote the easier discovery of scientific data, as well as convenient access and re-use when a search is conducted. To that end, the FLEETfor55 project follows the FAIR principles [6] to ensure effective management, sharing, and long-term preservation of research data.

To ensure Findability, datasets and related metadata are assigned Persistent Identifiers (PIDs) [8] – usually Digital Object Identifiers (DOIs) [9]- and are stored in trusted repositories. Rich and standardized metadata descriptions facilitate efficient discovery and identification of research outputs.

Accessibility is promoted in line with the project's Open Science commitments, while respecting confidentiality, intellectual property rights, and personal data protection requirements. Data and metadata are made available through standardized protocols that support secure access to those with appropriate rights [2]. Accessibility, as defined by FAIR principles also refers to ensuring that users can reliably retrieve data under well-defined conditions [10].

Interoperability, defined by the European Interoperability Framework (EIF) as the *"ability of organizations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organizations, through the business process they support, by means of exchange of data"* [11], is achieved through the adoption of common standards, metadata schemes, open formats, and established procedures that enable data exchange and integration across systems and organizations. Technical, semantic, organizational, and legal aspects are the main aspects of interoperability to facilitate effective data sharing and collaboration.

To support the FAIR principle of reusability, datasets are accompanied by sufficient metadata, clear licensing information, and well-documented provenance. Whenever possible, open-source tools and open licenses are preferred, enabling the wider scientific community and stakeholders to access, validate, and build upon the project's results.

2 Collection of Data, Handling and Documentation

2.1 Collaborative Structure of FLEETfor55

FLLETfor55 is a project structured into multiple Work Packages (WPs) and Tasks, that are assigned to the partners involved, as well as the Technology Innovation Network (TIN). Due to the structure and the large number of partners, the coordination and collaboration present challenging processes, that this report aims to simplify. The main data and knowledge sharing mechanisms used in the project are summarized below.

The “Exchange of Knowledge” is a fundamental aspect of collaboration, that represents the continuous sharing of expertise, experience, and scientific insights among partners, fostering informed decision-making and ensuring that project activities are grounded in validated scientific principles. This process is characterized by continuous dialogue and informal sharing.

The “Exclusive Data Network” refers to the sharing of data and knowledge in a more formal manner, following a standardized file sharing solution. This type of collaboration is found within each WP, where the flow of information is often linear and the collaborators may share data exclusively among themselves.

The “Research Data Pool” means that the generated data from each WP is to be unrestrictedly accessible to all partners of the project, so that it can be used for the various tasks. This model of collaboration involves the storing of all the data in a central server so that it can be securely accessed and shared by all partners.

A key element of the FLEETfor55 collaboration framework is the Technology Innovation Network (TIN), which connects the consortium with Energy Efficiency Technology (EET) providers and other industrial stakeholders. The TIN enables a two-way exchange of knowledge, data, and practical requirements, ensuring that project developments are aligned with industry needs and market realities. That way, the “Connection to Industry” is secured and through formal collaboration and data-sharing arrangements, the relevance, applicability, and impact of the project's research outcomes are enhanced.

2.2 Data Collection and Summary

2.2.1 Internal Project Repository Analysis

The data generated by the FLEETfor55 project are derived from various sources, resulting in a desirable variation in terms of data type, format, size and origin of data. Sources of data include experiments, workshops, models, analytical solutions and more. The level of dissemination of data, namely whether the data can be publicly accessible, is another challenge the project faces and for that reason the complete picture of the data is summarized in this DMP.

This section functions as an update on the work done in the Initial Data Management Plan in Deliverable D1.3, following the work already completed in the frame of the FLEETfor55 project.

For the various tasks that have been concluded, information had to be gathered. For task T2.5, for example, metrics in the form of Key Parameter Indicators (KPIs) were collected, for a specific vessel and three EETs, from various partners and analysed in Microsoft Excel files, in order for the holistic sustainability assessment to take place, in the context of Deliverable D2.5. Similarly, for task T3.4, directly linked to Deliverable D3.4, a large amount of KPIs was collected for all vessels and their compatible EETs, again through Microsoft Excel, to determine the most suitable EETs for each ship.

In the context of Deliverable 1.4, corresponding to the Data Management Plan for the first reporting period, a repository analysis was carried out to obtain an overview of the data and documentation stored in the consortium's workspace. The analysis was based on the metadata exported directly from the Microsoft Teams repository and further processed in Excel. The available metadata enabled the classification and assessment of the repository contents according to their location within the folder structure and the file type.

As the Figure 1 indicates, a total of 1727 files were identified in the analysed repository structure, with WP3 representing the largest share, containing 937 files, equivalent to approximately 54% of the total file volume. WP2 follows with 202 files, while the TIN related folder contains 168 files and the Meetings directory includes 134 files. WP9 and the "Others" category contain 122 and 121 files, respectively. In contrast, WP1, WP6, WP5 and WP8 contain significantly fewer files. In the category "others" are included the repository directories: {01. General Files, 02. Templates, 04. Contacts List, 05. Project Management Tables, 07. Communication Material, 09. Technical Reference Documents, 10. Dissemination and 11. Reporting}.

Also, on the Figure 2, a file type analysis shows that the repository is primarily composed of document files. Out of the 1727 files identified in the repository metadata, pdf files represent the largest share, with 928 files, corresponding to approximately 53.7% of the total. The second most frequent file type is .docx, with 325 files or approximately 18.8%, followed by .xlsx files with 191 files and .pptx files with 165 files.

The number and types of files used for each task, completed before the 18th month of the project is presented in Table 1.

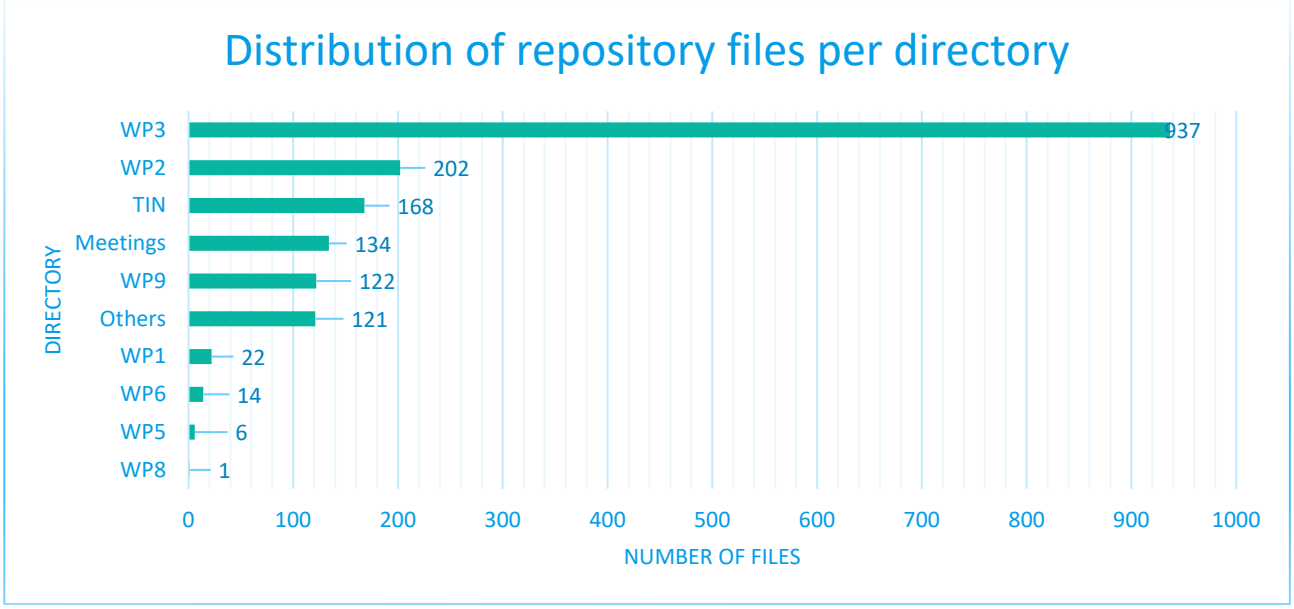

Figure 1: Distribution of files across repository directories

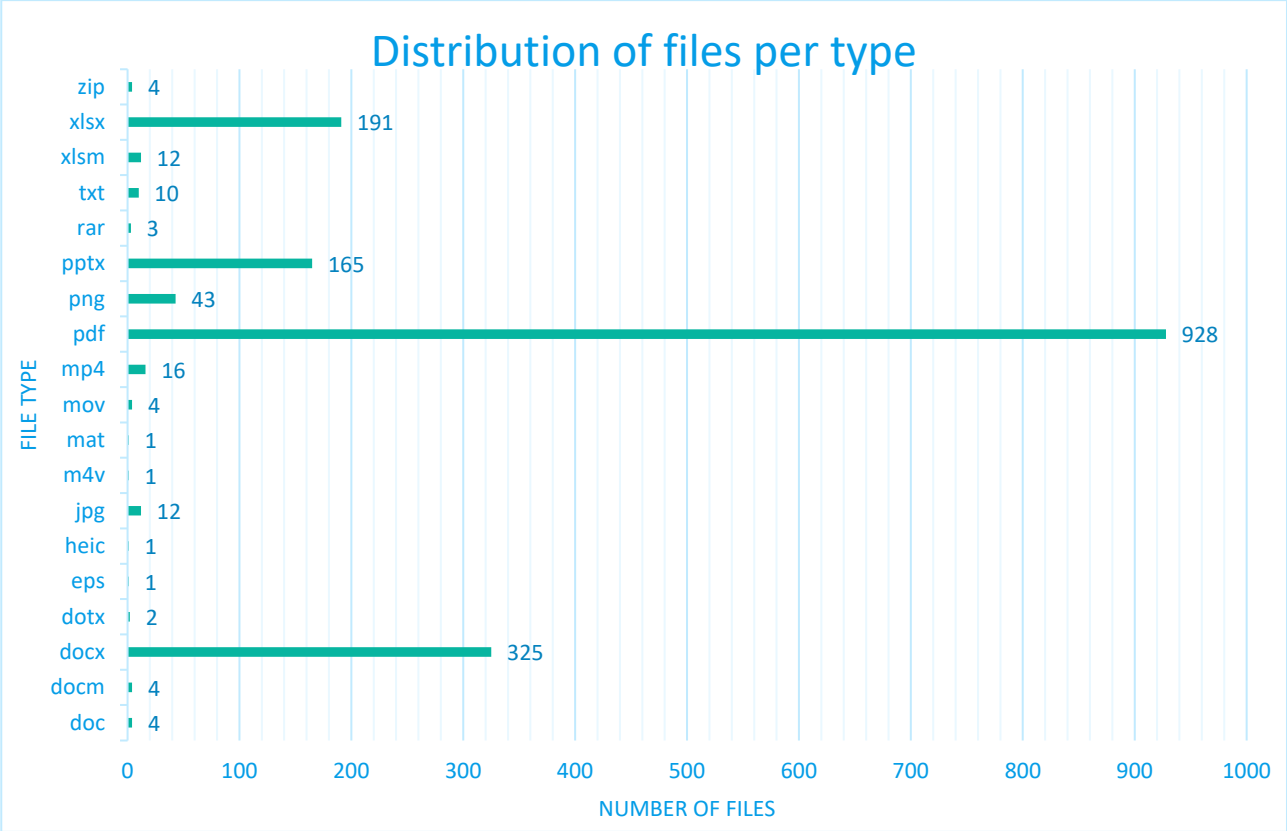

Figure 2: Distribution of repository files by file extension

Table 1: Number and Types of Files used for the Completed Tasks

	T2.1	T2.2	T2.3	T2.4	T2.5	T3.1	T3.2	T3.3	T3.4	T3.5
pdf	16	2	2	4	3	3	710	23	1	6
doc	0	0	0	0	0	0	1	3	0	0
docx	4	6	7	5	7	0	30	17	7	0
mat	0	0	0	0	0	0	0	1	0	0
png	0	0	0	0	0	0	9	0	2	0
pptx	0	1	0	0	2	0	7	0	3	0
rar	0	0	0	0	0	0	3	0	0	0
xlsm	1	0	0	0	0	0	1	0	0	0
xlsx	3	0	56	32	8	0	35	8	23	0
zip	0	0	0	0	0	0	4	0	0	0

2.2.2 Metadata Description Files

The metadata for each deliverable is collected in Metadata Description Files (MDFs) which are created upon the completion and submission of deliverables. The creation of an MDF is a mandatory requirement upon the completion of each deliverable, while it is also optional upon the creation of other output generated in the context of the FLEETfor55 project. In these files, all the information used to describe, manage and organize the deliverables can be found, such as the contributors' information, descriptions of the work, keywords, identifiers, related materials, software used, dissemination information and licensing information. All the attributes of the generated document that should be completed in the MDF stem from the Dublin Core elements [12].

Each partner is required to upload the MDF after submitting a deliverable, so that the metadata used can be mapped. So far, all MDF files corresponding to the deliverables submitted until M18 have been collected. Data related to the deliverables, collected from these MDFs is shown in Table 5. The template for the MDFs is shown in Annex A.

2.3 Mapping the FLEETfor55 Output

The following tables (Table 2, Table 3, Table 5) map the FLEETfor55 tasks that have been executed, and are yet to be executed, the partner that led them, as well as the relevant deliverables that have been submitted up to this point in the project (M18). These tables help summarise and categorise the produced data by the FLEETfor55 for project up to now, that are further analysed in the following sections.

In Table 2 the descriptions of the tasks completed until M18 are shown. Out of a total of 45 tasks, 12 tasks have been completed thus far.

Table 2: List of Completed Tasks and their Descriptions

Number and Title of Task	Period	Description According to the GA
Task T2.1 – Identification of alternative EETs & techno-economic data collection	M01 – M06	This task involves conducting a comprehensive search and identification of alternative EETs, considering design and operation aspects. It involves investigating various technologies, such as power conversion/electrification/energy devices, sustainable climate neutral low emission fuels, HVAC, energy storage, operations, smart energy monitoring, renewables including wind assistance, hydrodynamics-related aspects, cold ironing, slow steaming, just in time scheduling, propeller design, etc. and collecting corresponding techno-economic data (e.g. energy savings potential, capital costs, operational costs, maintenance requirements, and lifecycle considerations). The state-of-the-art will be identified and classified based on a variety of sources: scientific publications, information obtained from relevant suppliers, databases, published marked surveys such as Drewry's "Ship Operating Cost Annual Review and Forecast 2023/24". A joint workshop will be conducted with the project's EAB to seek additional insights from relevant technology providers.
Task T 2.2 – EETs market analysis, maturity evaluation, market uptake	M03 – M09	This task focuses on analyzing the market landscape for the identified EETs. The maturity level of each EET (TRLbased) will be assessed specifically for the shipping market. The market trends, adoption rates, as well as market and technical drivers and barriers for each EET will be analyzed and properly documented. The analysis includes evaluating both the current and projected market uptake of emerging EETs, identifying the key market players, and understanding the competitive dynamics as well as opportunities and challenges. A dedicated TIN workshop will be held close to the finalization of this task to support and enhance its findings.
Task 2.3 – Evaluation of the preliminary economic feasibility of each available EET	M04 – M10	The scope of task is the examination of the financial feasibility for the different available EETs. In this task, the costs (CAPEX and OPEX) and the benefits/cost savings of each EETs will be received as input by HYD, DNV, ABS,

Number and Title of Task	Period	Description According to the GA
		DST) or estimated appropriately and analyzed by WM with help form NTUA, EPS and UOS in the form of annual cashflows, spread over an appropriate reference period, in order to calculate the financial indicators that will enable the assessment of the profitability and sustainability for the proposed applications (e.g. Net Present Value - NPV, Internal Rate of Return - IRR, Payback period, Return on Investment - ROI). The gathered financial data will directly feed WP8 relating to the Life Cycle Cost Analysis and to the business models that will be developed, respectively.
Task 2.4 – Evaluation of the preliminary technical application and feasibility of each available EET	M03 – M10	This task involves assessing the technical characteristics, performance specifications, and applicability of the EETs to various use cases of the three vessel segments (IWT, SSS and OG) utilizing project established matrices and reviewed literature from Task 2.1. The evaluation will include conducting technical simulations through analytical calculations, pre-feasibility studies related to equipment sizing and concept installation arrangements, and empirical data to validate the technical viability of selected EETs. The goal is to identify EETs with the most promising technical potential for further consideration.
Task 2.5 – Development of decision-support systems for the holistic sustainability assessment of EETs	M06 – M15	T2.5 is dedicated to developing decision-support systems (UPAT) for a thorough evaluation of alternative Energy and Environmental Technologies(EETs). These systems will utilize Multi-Criteria Decision Support (MCDS) methodologies to address potentially conflicting aspects related to the alternative EETs. Those aspects include technical factors (T2.4) (HYD, RINA), environmental impact metrics (T8.1) (NTUA, UOS), economic factors related to economic feasibility and business models (T2.2-T2.3) (WM, NTUA), social aspects, and regulatory requirements (T8.2) (NTUA), all in alignment with the EU's "Fit for 55" goals and key performance indicators (KPIs). By applying MCDS approaches, the systems will be able to systematically analyze and balance these diverse and often competing factors, providing a more comprehensive and informed basis for decision-making. Input KPIs and data required for the decision support systems will be gathered through software tools,

Number and Title of Task	Period	Description According to the GA
		decision matrices, scoring/ranking systems, and visualizations to assist stakeholders in selecting and prioritizing EETs based on their specific needs, as provided to T6.5. Sensitivity analysis will be performed to ensure the robustness of the system. These systems will help stakeholders evaluate the overall sustainability of EETs, supporting their selection process.
Task 3.1 – Regulations, policies, mid-and long-term measures – Overview, forecast and gaps	M01 – M06	T3.1 will present the state of play of the current and forthcoming regulatory framework, as well as the policies governing the implementation and operation of EETs, with specific focus on the EU 'Fit for 55' legislative package, the IMO mid and long-term measures and the labelling system currently being developed in PLATINA4Action for inland ships. The analysis will spotlight the technical implications of regulatory compliance, identify the applicable industry standards and single out the key gaps in the provisions. These considerations will set the benchmark for the feasibility assessment of the proposed UCs and identify suggestions for improvement and stakeholders' advocacy.
Task 3.2 – Use cases definition, requirements and planning	M04 – M12	This task will define the specific use cases, outlining the boundaries and the data required. Particular attention will be paid to ensure short / mid-term uptake of the EETs, in line with the expectations of the EU "Fit for 55" legislative package. Several technologies and solutions will be considered for possible combinations and integration. For each vessel type, retrofit solutions will be proposed for the baseline design (from 2008), as well as new vessel designs, leading to ten (10) unique use cases in total. Data concerning various operating scenarios will be collected to evaluate the UCs. Overall, this task will pave the way for the evaluation to be carried out in T3.3 and the engineering design in WP4.
Task 3.3 – Development of KPIs, assessment metrics and QFD method for evaluating the use cases	M04 – M12	This task will develop techno-, socio-, environmental and economic KPIs, the corresponding assessment metrics and a QFD-based method for evaluating the alternative combinations of EETs and vessel types. The KPIs will include indicators on: a) decarbonization of shipping; b) suitability for the broadest possible range of vessels and

Number and Title of Task	Period	Description According to the GA
		operations; c) potential for the highest commercial uptake and the shortest transition period to a zero-carbon fleet; d) potential for standardization and scaling; e) market-readiness and techno-economic viability. Assessment metrics corresponding to the KPIs and a data register will be established. The developed QFD-based method will be made available after the end of the project, for all industry stakeholders to assess the applicability of FLEETfor55 solutions.
Task 3.4 – Assessment and ranking of use cases	M08 – M14	This task will assess the proposed UCs against their potentials and effectiveness to meet the EUs "Fit for 55" targets, together with the assessment of their energy performance, environmental impact, operability, maintenance, installation feasibility and safety aspects. The assessment and ranking of the UCs will be performed based on the defined KPIs in WP2. The input to this Task will be the UC's operating profile and commercial requirements. Fit-to-purpose models will be used for the operational assessments. This will be carried out for all the ten (10) UCs, thus covering a comprehensive range of the existing world commercial fleet, in terms of ship types, missions, and sizes.
Task 4.1 – Energy systems modelling requirements and specification	M07 – M18	In this task, the requirements, specifications and data required for the holistic energy systems modelling will be determined based on vessel's type, operational profile, energy consumption, design parameters and the type of the examined EETs. The necessary metrics to assess the examined EETs, in the context of each specific use case, will be determined. A template for each use case will be developed listing the data required, their sources and the partner responsible for gathering it within a specific timespan.
Task 5.1: Analysis of safety requirements assessment models / practices and regulatory GAP	M04 – M14	This task is engaged with an in-depth safety analysis on adopting EETs for new designs and retrofits to obtain regulatory gaps/challenges and comprehension. By scrutinizing/identifying shortcomings in current safety evaluation protocols/ models, this task seeks to propose an enhanced risk assessment framework. A blend of qualitative and quantitative risk evaluation models will be developed in response to the needs of safety

Number and Title of Task	Period	Description According to the GA
		evaluation on various EETs in accordance with design stages, hazard types and the relevance of risk assessment approaches to determine their impacts. Key findings of T5.1 will be utilized as a key reference for the basic/concept designs of EETs (WP4) and the rest of WP5 tasks.
Task 6.1 – Development of platform architecture frame & implementation plan	M10 – M18	This task will develop the platform IT architecture and provide as a result the implementation plan. To avoid a rigid system, a flexible (various stakeholders can use it), extendable (various 3rd party tools/systems can be integrated) and finally affordable architecture will be targeted (e.g. for SMEs, since stakeholders can decide on their own which tools to use for populating the platform with data and thereby facilitating introduction step by step). To ease access to the platform, a web-based approach will be realized considering cyber security aspects and IPR.

In Table 3, the leaders and partners involved in each of the completed tasks is presented. Similarly, in Table 4 the leaders and partners of the rest of the project tasks are presented, while the deliverables, relevant to each task, are presented in both tables.

Table 3: Leaders, Partners and Relevant Deliverables of Completed Tasks

Task	Leader	Partners	Relevant Deliverable(s)
2.1	NTNU	HYD, NTUA, RINA, UPATRAS, UOS, DST, ABS, FCSI, WM	D2.1
2.2	NTUA	HYD, RINA, WM, EPS, DST, ABS, FCSI	D2.2
2.3	WM	HYD, NTUA, UOS, EPS, DNV, ABS, DST	D2.3
2.4	HYD	RINA, WM, NTUA, UPATRAS, UOS, EPS, DNV, NTNU, DST, ABS	D2.4
2.5	UPATRAS	HYD, NTUA, RINA, WM, UOS, EPS, NTNU, ABS, FCSI, AES, DST	D2.5
3.1	RINA	UOS, EPS, DNV, ABS, DST	D3.1
3.2	RINA	HYD, NTUA, UOS, EPS, DNV, CIRCLE, NTNU, MGLCRL	D3.2
3.3	DNV	HYD, RINA, UPATRAS, UOS, EPS, NTNU, NTUA	D3.3
3.4	NTNU	HYD, RINA, UPATRAS, UOS, EPS, DNV, NTUA	D3.4

Task	Leader	Partners	Relevant Deliverable(s)
4.1	NTUA	HYD, RINA, UPATRAS, UOS, DNV, NTNU, ABS, FCSI	D4.1
5.1	UOS	RINA, NTUA	D5.1
6.1	AES	NTNU, HYD, UPATRAS, UOS, WM, RINA	D6.1

Table 4: Leaders, Partners and Relevant Deliverables of Upcoming Tasks

Task	Leader	Partners	Relevant Deliverable(s)
1.1	HYD	All	D1.1, D1.2
1.2	HYD	All	D1.1, D1.2
1.3	EPSILON	All	D1.1, D1.2
1.4	UPATRAS	All	D1.3, D1.4, D1.5, D1.6
3.5	HYD	DST, RINA, NTUA, UOS, DNV, NTNU, FCSI, ABS	D3.5
4.2	HYDRUS	DST, RINA, UOS, DNV, NTNU, ABS, FCSI	D4.2
4.3	NTUA	HYD, DST, UPATRAS, UOS, DNV, NTNU, ABS, FCSI	D4.3
4.4	HYDRUS	DST, RINA, DNV, UOS, NTNU, ABS, FCSI, AES	D4.4
4.5	FCSI	HYD, RINA, UPATRAS, DNV, UOS, NTNU, ABS, AES	D4.5
4.6	ABS	HYD, RINA, UOS, FCSI	D4.6
5.2	EPS/NTUA	HYD, RINA, UOS, NTUA	D5.2
5.3	UoS	HYD, RINA, EPS, NTUA	D5.3
5.4	UoS	HYD, RINA, UPATRAS, NTNU	D5.4
5.5	EPSILON	RINA	D5.5
5.6	UoS	RINA, EPS	D5.6
6.2	UPATRAS	AES, NTUA, NTNU, HYD, UOS, WM, RINA	D6.2
6.3	AES	NTNU, UPATRAS, UOS, WM	D6.3
6.4	EPSILON	AES, NTUA, NTNU, HYD, UPATRAS, UOS, WM	D6.4
6.5	NTNU	AES, NTUA, HYD, UPATRAS, UOS, WM	D6.5
7.1	UPATRAS	AES, HYD, UOS, NTNU, FCSI	D7.1
7.2	HYDRUS	DST, RINA, UPATRAS, UOS, NTNU, FCSI	D7.2
7.3	FCSI	HYD, DST, RINA, UPATRAS, UOS, NTNU	D7.3
8.1	NTUA	HYD, WM, UOS, EPS, DNV, VPF, ABS, FREIRE, UPATRAS	D8.1
8.2	NTUA	WM, UPATRAS, UOS, EPS, DNV, RINA	D8.2
8.3	WM	EPS, UOS, VPF, FCSI, NTUA	D8.3
8.4	UPATRAS	NTUA, WM, UOS, EPS, DNV	D8.4
8.5	VPF	NTUA, WM, UOS, CSM, STEALTH, SFAST, HYD, UPATRAS, RINA	D8.5
8.6	FREIRE	NTUA, WM, UOS, CSM, STEALTH, SFAST, HYD, UPATRAS, RINA	D8.6
9.1	CERTH	All	D9.1, D9.3

Task	Leader	Partners	Relevant Deliverable(s)
9.2	MGLCRL	All	D9.2, D9.3
9.3	WM	HYD, MCI, UOS, DNV, EPS, NTUA	D9.4, D9.5, D9.6, D9.7
9.4	MGLCRL	All	D9.8, D9.9, D9.10, D9.11
9.5	MGLCRL	CERTH, UPATRAS, HYD, WM, UOS, DNV, DST, ABS, NTUA, VPF	D9.12, D9.13

In Table 5, the deliverables that have been submitted or are to be submitted by M18 are presented, along with a short description. The description is either provided by the Metadata Description File (MDF) if the deliverable has been submitted, or from the GA, if the submission is still pending. The MDF is a supplementary file that includes all the information used to describe, manage and organize the deliverables, as it will be thoroughly presented at chapter 2.2.2. By M18, 22 deliverables are to be submitted, out of a total of 54 by M42.

Table 5: List of Completed Deliverables and Description

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D1.1 – Initial Project Handbook	M01 – M04 (Finalised)	HYD	The initial Project Management Plan (PMP) serving as handbook for the "State-of-the-art sustainable energy efficiency technologies roadmap for waterborne transport towards the fit-for-55 guidance compliance" (abbr. FLEETfor55) project in order to ensure an efficient project implementation as well as high quality project results. With this handbook, activities of all work packages are coordinated and consolidated throughout the project duration. It ensures that all necessary steps will be planned and synchronized to achieve the goals of the project	-

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
			during the different phases. The continuous work planning will be a major tool to ensure project continuity. Related to tasks T1.1, T1.2 and T1.3.	
Deliverable D1.3 – Initial Data Management Plan	M01 – M06 (Finalised)	UPAT	Initial Data Management Plan identifies the available and commonly applicable data management policies, then performs a preliminary analysis of the FLEETfor55 project data, as defined by the project partners and sets the project standards and rules for the data management (secure storage, handling and long-term preservation). Related to task T1.4.	Data Management Plan, FAIR principles, Findability, Accessibility, Interoperability, Reusability, Open Science Practices, DMP Questionnaire, Metadata

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D2.1 – Alternative EETs & techno-economic data	M01 – M06 (Finalised)	NTNU	The Identification of alternative EETs & technoeconomic data collection involves a comprehensive search and identification of alternative EETs, considering design and operation aspects. It involves investigating various technologies, such as power conversion /electrification /energy devices, sustainable climate neutral low emission fuels, HVAC, energy storage, operations, smart energy monitoring, renewables including wind assistance, hydrodynamics-related aspects, cold ironing, slow steaming, just in time scheduling, propeller design, etc. and collecting corresponding techno-economic data (e.g. energy savings potential, capital costs, operational costs, maintenance requirements, and lifecycle considerations). The state-of-the art identified and classified based on a variety of sources were conducted. Related to task T2.1.	Energy Efficiency Technologies (EETs), taxonomy, Alternative EETs, Feasibility, Applicability, Technological Readiness Level (TRL), multicriteria evaluation assessment, Techno-economical data, PRISMA, IMO, data harmonization, metrics, Inland water Transport(IWT), Shortsea Shipping(SSS), Oceangoing vessels(OC), new building, retrofits, Hydrodynamics Efficiency Improvements, Propeller and Propulsion Optimization, Operations and Digital Optimization, Sustainable, Climate-Neutral and Low-Emission Fuels, Power Conversion, Electrification, and Energy Devices, Optimized Engineering Approaches, Renewable Energy Integration and categorization.

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D2.2 – EETs Market Analysis	M03 – M09 (Finalised)	NTUA	This deliverable evaluates the maturity of Energy Efficiency Technologies (EETs) in the shipping market using the Technology Readiness Level (TRL) framework, based on a comprehensive literature review and expert insights. It analyses market trends, current adoption levels, and expected short-term uptake, together with the main drivers and barriers influencing deployment. In addition, it examines potential pairings and combinations of EETs, identifies their applicability across vessel categories, and highlights the key market players involved in the development and integration of these technologies. Related to task T2.2.	Energy Efficient Technologies (TRL), Renewable Energy Integration, Sustainable, Climate-neutral and Low-emission Fuels, Hydrodynamic Efficiency Improvements, Propeller and Propulsion Optimization, Operations and Condition-based Monitoring, Optimized Engineering Approaches, Power Conversion, Electrification and Energy Devices, Market Analysis, TRL, adoption rates, Clarkson's Shipping Intelligence Network (SIN)

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D2.3 – EETs preliminary economic feasibility analysis	M04 – M10 (Finalised)	WML	D2.3 is a feasibility study of the financial evaluation of energy efficient technologies applicable to maritime transport. The feasibility study focuses on retrofit cases of medium-sized short-sea and inland waterway vessels, assessing the financial viability of selected technologies through a detailed analysis of capital and operational expenditures, energy and cost savings, and key financial indicators such as FNPV, FIRR and PP. Related to task T2.3.	EETs, short-sea vessels, inland waterway vessels, EETs ranking

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D2.4 – Preliminary technical evaluation of EETs	M03 – M10 (Finalised)	HYD	The preliminary technical evaluation of Energy Efficiency Technologies (EETs) focuses on technical feasibility, integration complexity, and operational and environmental performance, independent of economic or deployment-specific business constraints. The main objective is to establish a consistent technical backbone for subsequent analyses and design activities. The evaluation defines a structured and traceable pathway for the technical and engineering assessment of EETs, providing an overview of their engineering characteristics and technical constraints. Related to task T2.4.	Preliminary technical Assessment, Energy Efficiency Technologies (EETs), Maturity of Technology, Space and Weight Requirements, Integration complexity, Operational Compatibility, Environmental and Operational Performance, Spider Matrix Methodology, Globally Applied Energy Efficiency Technologies, Carbon Capture Systems (CCS), Energy Optimized Technologies, Hydrodynamic Efficiency Improvements Technologies, Power Conversion Technologies, Electrification Technologies , Propeller Energy Saving Devices, Renewable Technologies, Sustainable, Climate – Neutral & Low Emission Fuels.

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D2.5 – Decision-support system on EETs	M06 – M15 (Finalised)	UPAT	The decision-support system on EETs utilises the holistic sustainability assessment methodology and using data collected from partners of the FLEETfor55 project it can be used to calculate the sustainability index of different use cases with one or more EET, allowing for reliable comparisons between them. Its purpose is to find the most sustainable use case, taking into account the user's input. Related to task T2.5.	Decision support system, holistic sustainability assessment, Multi-Criteria-Decision-Making, EETs, KPIs, sustainability pillars, performance, environmental impact, economic impact, social impact, circularity, SI, weights, sensitivity, demonstration case, normalization, stakeholders, use case, decarbonisation

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D3.1 – Regulatory GAP analysis report	M01 – M06 (Finalised)	RINA	D3.1 presents the state of play of the current and forthcoming regulatory framework (IMO, EU) governing implementation and operation of Energy Efficient Technologies (EETs) on new ships' design and existing fleet retrofit. The report focuses on EU 'Fit for 55' legislative package, IMO MEPC measures, and regulations applicable to inland navigation. A review of the regulations is performed and the possible gaps and barriers of the technical shortcomings in marine rules, regulations, guidelines, and industry standards are presented. Related to task T3.1.	Regulatory framework, EU regulations, international regulations, inland vessels, standards, energy efficiency technologies, gaps, barriers

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D3.2 – Definition and data requirements for the use cases	M04 – M12 (Finalised)	RINA	In D3.2 the specific vessels of the desktop studies were defined, and it was performed a preliminary analysis of their operating profile. An initial screening of EETs per vessel case was conducted (considering technical feasibility) in order to evaluate which EET would fit onboard each vessel case and propose the possible combination of EETs that would be advanced for further assessment through the next tasks. Finally, eleven (11) desktop cases were promoted with the selection of the most promising EETs per case, respectively, while incorporating the end users' feedback. Related to task T3.2.	Use cases, Energy efficient technologies, Workshop, technical feasibility, data collection, operating profile, end users
Deliverable D3.3 – Performance evaluation criteria for use cases	M04 – M12 (Finalised)	DNV	This deliverable establishes a structured KPI framework across technical, environmental, economic and socio-political domains and adapts an ISO-aligned QFD methodology to evaluate EETs and vessel configurations; includes normalization procedures, data register, relationship	KPIs; QFD; House of Quality; Energy Efficiency Technologies (EETs); maritime decarbonization; Fit for 55; IMO; lifecycle emissions; CAPEX/OPEX; decision support

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
			and correlation matrices, and a worked example. Related to task T3.3.	
Deliverable D3.4 – Assessment of EETs for all use cases	M08 – M14	NTNU	All eleven (11) desktop cases, including the potential EETs to be implemented onboard, were challenged in terms of energy performance, environmental impact, operability, maintenance, installation feasibility and safety aspects against the" Fit for 55" targets. Related to task T3.4.	-
Deliverable D4.1 – Specification & requirements of energy systems modelling	M07 – M18	NTUA	This report will provide a correlation between the identified requirements, specifications, data based on the vessel type, operational profile, energy consumption and design parameters of the EETs. A template with the required data, source and responsible partner will be part of the report. Related to task T4.1.	-
Deliverable D5.1 – GAP and risk assessment models	M04 – M14	UoS	This report includes the regulatory GAP and risk assessment models. Both qualitative and quantitative risk evaluation models are developed in relevance to the needs of the safety evaluation on various EETs. Related to task T5.1.	-

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D6.1 – Digital platform architecture	M10 – M18	AES	Development of platform architecture frame & implementation plan. Related to task T6.1.	-
Deliverable D9.1 – Initial TIN requirements & engagement plan	M01 – M06 (Finalised)	CERTH	The 'Initial TIN requirements and engagement plan' defines the design of the Technologies Innovation Network (TIN), including its rationale and objectives, its initial and intended composition to effectively support and inform project Work Packages (WPs), as well as its membership expansion and stakeholder engagement strategy. Related to Task T9.1.	Technologies Innovation Network, Stakeholder engagement, Energy Efficiency Technologies providers, Network design, Network governance, Expansion strategy, Collaboration, Knowledge exchange, Data sharing, Data confidentiality

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D9.2 – Initial TIN outreach strategy	M04 – M09 (Finalised)	MCI	Project deliverable D9.2 produced under WP9 / Task 9.2. It defines the initial outreach and engagement strategy for the Technologies Innovation Network (TIN) of FLEETfor55, including engagement framework and tools, clustering events (approx. every 6 months), preliminary planning of dedicated TIN workshops (≥3), communication actions supporting outreach, interfaces with the External Advisory Board (EAB) and synergies with other Horizon Europe initiatives. The deliverable also describes data management and feedback handling principles (LoIs/NDAs, secure storage in Teams, linkage with DMP). Related to Task T9.2.	TIN; outreach strategy; stakeholder engagement; clustering events; workshops; EAB; dissemination; communication; Horizon Europe; maritime; waterborne transport; energy efficiency technologies (EETs); Fit for 55

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D9.4 – Initial exploitation plans and IPR	M04 – M06 (Finalised)	WML	D9.4 is the initial exploitation plan and IPR strategy that provides a foundation for the identification of exploitable results and Key Exploitable Results, exploitation pathways, and IPR management. It provides high-level information on market insights, stakeholder engagement, and relevant regulations. Related to Task T9.3.	Exploitation strategy, Key Exploitable Results, stakeholder engagement, IPR
Deliverable D9.5 – RP1 exploitation plans and IPR	M04 – M18	WML	First updated version of roadmap with the planned and conducted specific exploitation activities and intellectual property rights during the project life. Related to Task T9.3.	-
Deliverable D9.8 – Initial report on dissemination & communication	M01 – M4	MCI	Initial and periodically updated project D&C strategy including a record of activities (e.g. project logo and visual identity), C&D tools (e.g. webinars, workshops, Q&A section in the project's website) and internal working documents production. Related to Task T9.4.	-

Number and Title of Deliverable	Period	Leader	Description According to the MDFs/GA	Keywords
Deliverable D9.9 – RP1 report on dissemination & communication	M01 – M18	MCI	First update of D&C strategy including a record of activities (e.g. project logo and visual identity), C&D tools (e.g. webinars, workshops, Q&A section in the project's website) and internal working documents production. Related to Task T9.4.	-
Deliverable D9.12 – Initial report on synergies and EAB establishment	M01 – M12	MCI	Initial and periodically updated of the EAB, providing advice on strategic and managerial decisions, through their engagement in annual meeting. In addition, another task of the EAB is to ensure a close cooperation with new Horizon Europe initiatives. Related to Task T9.5.	-

2.4 Other Research Outputs

This chapter is dedicated to the other research outputs of the project, which initially were not included in the GA, such as publications/research papers, Software and Tools, Protocols and Methodologies, Models and Simulations and Training Material.

During the current reporting period, two publications relevant to the project (containing project data) were submitted by project partners.

2.4.1 Publications

Project partners may choose to publish works based on the methods and frameworks developed in the context of the FLEETfor55 project. When publishing such works, the agreement of other related partners is required via copyright agreements, to transfer the rights to publish information obtained through the project.

One such publication, based on the work completed under deliverable D3.3, "Development of KPIs, assessment metrics and QFD method for evaluating use cases", led by DNV, has been submitted to the 9th International Symposium on Ship Operations, Management & Economics (SOME), taking place on the 15th and 16th of September in Athens. The paper was titled "QFD-Based Framework for Multi-Criteria Evaluation of Maritime Energy Efficiency Technologies", while various partners (HYD, RINA, NTUA, UPAT, DST) were involved and agreed to the use of project data. The publication, along with the data used and the authors' agreements, have been uploaded on the FLEETfor55 Microsoft Teams directory, following the path: {Documents > General > 06. WPs > WP3 > T3.3-D3.3 > SOME 2026}.

Furthermore, a paper titled "Energy efficiency classification for 'Technologies Innovation Network' eligibility" was published in the "Innovations in Maritime Technology and Engineering" collection from the 8th International Conference on Maritime Technology and Engineering (MARTECH 2026)), that was held in Lisbon, Portugal, on 27-29 May 2026. Several project partners were involved (HYD, AES, CERTH, DST), while it is acknowledged that part of the paper was produced within the scope of the FLEETfor55 project. All relevant information on this publication has been uploaded on the Microsoft Teams directory, following the path: {Documents > General > 10. Dissemination > [FLEETfor55]_Publications > MARTECH_2026}.

2.5 Data Security

As mentioned in the Initial DMP, data security in the FLEETfor55 project is handled with a clear and robust approach, wherein unshared data are stored locally within each partner's drives and secure platforms. Partners are expected to perform backups to mitigate risks associated with the use of third-party platforms, in accordance with the DMP Backup Protocol and to ensure strict compliance with the dissemination level of the datasets they utilise.

Shared data are stored centrally in Microsoft Teams, which is integrated with SharePoint, ensuring that all data are synced and have a level of security ensured by Microsoft. Compliance with the General Data Protection Regulation (GDPR) is the responsibility of each partner, as well as defining the dissemination level of every generated dataset.

Only authorized project partners may have access to the Microsoft Teams, managed by Hydrus. Access is granted only to invited users with personal accounts and credentials, in order to ensure that data sharing remains secure and controlled.

All partners have complied with the data security guidelines adopted in the FLEETfor55 project. All unshared data remains stored locally before being uploaded in Microsoft Teams, where all partners can access it, under the designated folder. That way all data is synced and can be easily and securely reached by any partner that may want to use it.

2.6 Ethical Aspects

As described in deliverable D1.3, the FLEETfor55 Consortium has to adhere to ethical practices defined by the EU for the duration of the project, as well as after its completion, with attention needed to prevent misuse of personal data. Namely, during all dissemination activities the data has to be stored and presented in anonymous form and in a confidential manner.

Per the GA, the project is not to include aspects involving clinical trials or processing of personal data. It is to be limited to mechanical engineering concepts, with the design activities required to have no potentially harmful impacts on local communities and the environment.

Also, due to AI tools being more and more commonly used, the Consortium has to follow a specific ethically focused approach during the development, deployment and use of AI-based solutions, aligned with the EU AI Act [13].

This policy establishes the principles and requirements for the responsible development, deployment, and use of Artificial Intelligence (AI) systems and AI-assisted tools within the activities of EU projects, while all project partners and contributors are required to comply.

According to the EU AI Act, the use of AI shall be human-centric, transparent and aligned with the requirements of this Act, as well as other applicable EU and national legislation.
Only AI tools and systems that have been assessed and approved by the project governance body or participating organisations may be used for project activities involving project data, personal data, confidential information, or intellectual property.

Permitted uses of AI may include, among others:

- drafting, editing, and summarising non-sensitive documents;
- language support, translation, and communication assistance;

- data analysis, coding support, and research assistance, where appropriate safeguards are applied;
- innovation, experimentation, and other activities consistent with the project objectives.

The use of AI tools that pose unacceptable risks under the EU AI Act or that have not been authorised for handling project-related information shall be prohibited.

AI systems should be used as decision-support tools and should not replace human judgment, as project participants must remain responsible for the accuracy, quality, legality, and ethical acceptability of any AI-generated output. All AI-generated content, analyses, recommendations, or technical outputs shall be reviewed and validated before being incorporated into project deliverables, publications and other dissemination material.

The use of AI must be appropriately documented and disclosed where it materially contributes to project outputs. Where required by applicable legislation or contractual obligations, project partners have to ensure that individuals are informed when they interact with AI systems or when AI-generated or AI-manipulated content is presented.
The use of AI involving personal data shall comply with General Dara Protection Regulation (GDPR) principles, including lawfulness, fairness, transparency, purpose limitation, accuracy, storage limitation, integrity, and confidentiality.

Personal data, confidential project information, or intellectual property may not be entered into external AI tools unless appropriate safeguards are in place and the use has been authorised by the relevant organisation. Where necessary, Data Protection Impact Assessments (DPIAs), risk assessments, and appropriate records of processing shall be carried out. Project partners shall evaluate AI-related risks, including risks related to fundamental rights, bias, reliability, cybersecurity, and misuse. Any significant incidents, security breaches, or non-compliance related to AI use shall be reported through the appropriate procedures.

Lastly, this policy shall be reviewed periodically and updated to reflect developments in AI technologies, the EU AI Act implementation timeline, and applicable legal requirements.

Based on the current progress of the project, no changes or conflicts have arisen regarding the ethical aspects described above. All data from the partners is required to obey the rules of confidentiality before dissemination, so as not to disclose personal information. Moreover, the use of AI-based solutions is disclosed when needed. An ethical concern expressed by the majority of partners was the acknowledgment of potential legal or ethical issues. For that reason, getting informed consent for the reusage or sharing of the data from the relevant partners also became an ethical requirement. Also, this consent must be provided within a two-week period.

2.7 Allocation of Resources

An important aspect of every DMP, apart from the identification of research data and outcomes, is also the consideration of potential economic resources that might be required for its

implementation. At the current stage, no additional costs are anticipated beyond those already allocated in the GA of the FLEETfor55 project. Nonetheless, future versions of the DMP may identify additional costs, provided they are properly justified by the project's activities and potential needs.

2.8 Other Aspects

In deliverable D1.3, other procedures and policies that may apply were analysed, to note any potential issues, conflicts or questions that could arise. Such issues are addressed during the regular meetings of the Consortium, with no further potential conflicts arising.

3 Data Storage and Sharing

3.1 Infrastructure

Microsoft Teams was selected to be the main repository throughout the project. Only partners with authorized profiles or invited users with personal accounts and credentials can access it, after being added from the project coordinator – Hydrus. Files are automatically and in sync updated throughout the repository. That way, data sharing remains both secure and controlled.

In the FLEETfor55 General Assembly, which took place on Trondheim 24-25 of June 2025, it was agreed that all public documents generated during the project will be uploaded and released for public access through the project's official website, www.fleetfor55.eu. Until now, a total of 12 deliverables can be found on the website. The structure of the FLEETfor55 Microsoft Teams folders that account for administrative, communication and technical aspects of the project can be seen in Figure 3.

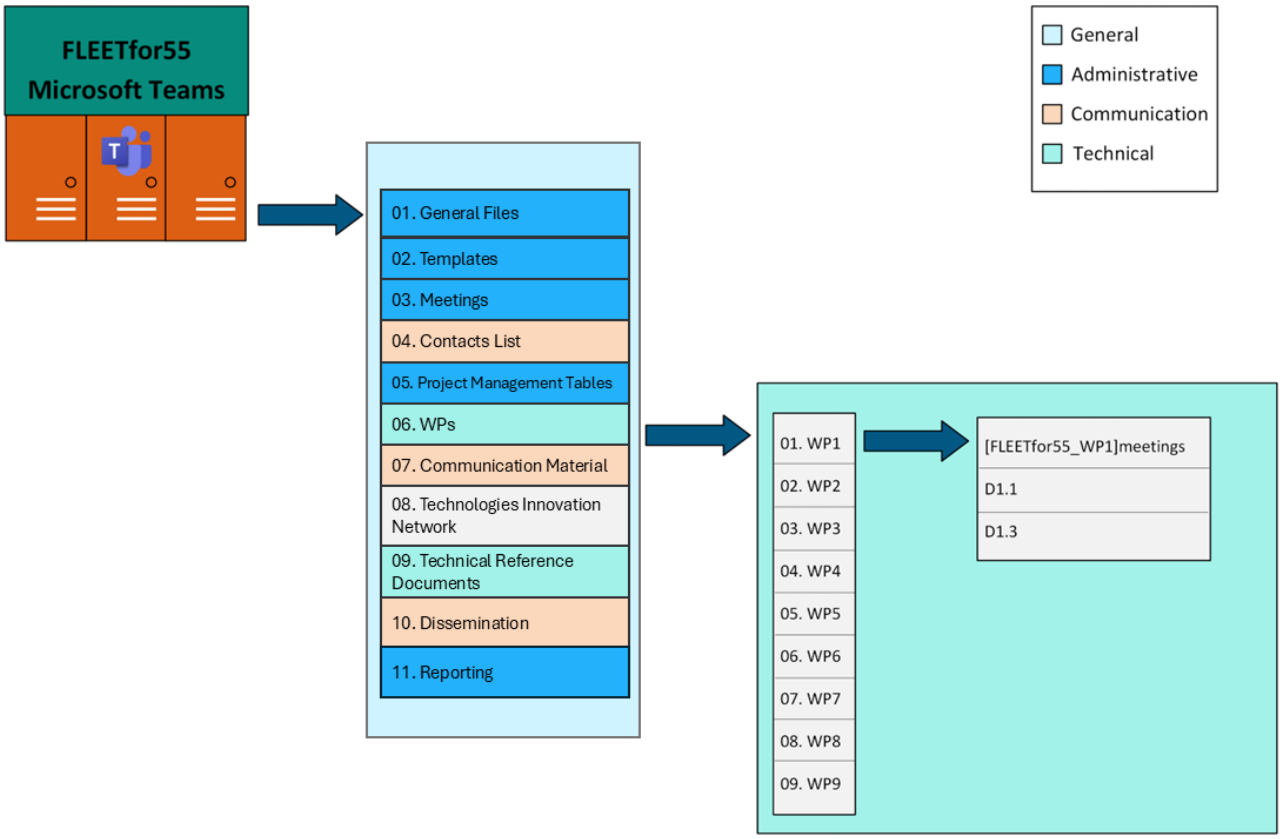

Figure 3: Structure of FLEETfor55 Teams folders

The number, type and dissemination level of files that have been uploaded or will be uploaded by month 18 of the project, per WP, can be seen in Table 6.

Table 6: Number, Type and Dissemination Level of Deliverables per WP

WP	Deliverable	Type of Deliverable	Dissemination Level
1	D1.1	R - Document, report	PU - Public
	D1.3	DMP – Data Management Plan	PU – Public
	D1.4	DMP – Data Management Plan	PU – Public
2	D2.1	R - Document, report	PU - Public
	D2.2	R - Document, report	PU – Public
	D2.3	R - Document, report	SEN – Sensitive
	D2.4	R - Document, report	SEN - Sensitive
	D2.5	R - Document, report	PU – Public
3	D3.1	R - Document, report	PU – Public
	D3.2	R - Document, report	PU – Public
	D3.3	R - Document, report	PU – Public
	D3.4	R - Document, report	SEN – Sensitive
	D3.5	R - Document, report	SEN – Sensitive
4	D4.1	R - Document, report	PU – Public
5	D5.1	R - Document, report	PU – Public
6	D6.1	R - Document, report	SEN - Sensitive
9	D9.1	R - Document, report	PU – Public
	D9.2	R - Document, report	PU – Public
	D9.4	R - Document, report	SEN - Sensitive
	D9.5	R - Document, report	SEN - Sensitive
	D9.8	R - Document, report	PU – Public
	D9.9	R - Document, report	PU – Public
	D9.12	R - Document, report	PU - Public

3.2 Backup-Protocol

As an additional safety measure, data is backed up monthly, with each individual partner being responsible for performing this action. In the event of failure, this strategy allows the data to be restored.

3.3 Post-project data storage

To ensure transparency, reproducibility and broad impact, the main scientific outputs of the project, have to be openly accessible. For that purpose, Zenodo was selected as the official open-access repository for the storage and dissemination of data produced within the project, as the platform ensures compliance with FAIR data principles and alignment with the European Commission's open science policies. The above was decided in deliverable D9.8, where the FLEETfor55 Zenodo profile is also shown [14].

4 Conclusions

This follow-up Data Management Plan aims to map the progress done up until the 18th month of the project, as well as to record any potential issues or additional requirements to the project's original framework. The completed tasks and deliverables are listed, as well as information on the data used for each Work Package and Task. Furthermore, resulting publications and other outputs are mapped and data security, ethical aspects, allocation of resources and other issues are reported. For additional information regarding the TIN strategy, exploitation plans and Key Exploitable Results, Intellectual Property Rights strategy, dissemination - communication and synergies – EAB establishment, the reader is referred to the respective WP9 deliverables.

Overall, Deliverable D1.4 confirms that the FLEETfor55 DMP remains a living document that evolves in parallel with the project. The updated plan reflects the progress achieved during the first reporting period, consolidates the rules and procedures established in the Initial DMP. Future updates of the DMP will further refine the data management framework as additional datasets, deliverables, research outputs and partner contributions are generated. The next deliverable (D1.5) is scheduled for M36 (December 2027), while the final version of the DMP is scheduled to be published in M42 (June 2028), the final month of the project.

The updated version of the DMP indicates that the project remains on track, with no issues such as miscommunications or loss of files being raised by partners. Simultaneously, Microsoft Teams is a useful internal repository for the FLEETfor55 project, while also serving as a communication platform, which fosters partner collaboration. The initial categorisation in Teams was also efficient, as no loss of files has been reported, no changes on the existing folders was required and only some new folders have been added. Also, no issues of ethical nature have arisen during this reporting period. As a result, Microsoft Teams will remain the main internal repository and communication platform of the FLEETfor55 project.

Data Management Contact Personnel

Contact person a: **Prof. Angelos Filippatos**, Associate Professor at the University of Patras
Email: angelos.filippatos@upatras.gr
Responsibilities

- Initial Data Management Plan and continuous update of DMP

Contact person b: **Mr. Astrinos Papadakis**, Innovation Hub Manager – FLEETfor55 Project Coordinator, HYDRUS Engineering Ltd.
Email: a.papadakis@hydrus-eng.com
Responsibilities

- Hydrus is responsible for FLEETfor55 project administrative and technical coordination

5 Annex A

5.1 Data Description

This section presents the basic information about the generated source (i.e., the corresponding deliverable, model, publication, or other item described by this template), and summarizes the required details in Table 7. Every partner that provides data to the consortium is required to complete Table 1 with respect to the following requirements set by UPAT:

Table 7: Metadata Description Table

Parameter	Description	Value
Author	The main author is one per source. Organisation should also be referred, along with the ORCID if available.	
Organisation	Main organisation that developed the source	
Contact Person	Name & email of the person to be contacted for further information	
Contributors	Contributing persons to the source	
Contributing Organization (s)	Contributing organisations to the source	
Title	The name given to the source	
Date	Date the source is uploaded/shared to the consortium	
Version	Indicate if the developing of the source is Ongoing (v0.x), or the final version (v1.0) of the source is provided	
Description	An overview of the source	
Keywords	List of indicative keywords of the source	
Validation/ Verification	Description on how the review of the source was conducted	
Specific Identifier	The name of each source should follow the agreed structure, found on the [chapter 2] explanatory section.	

Parameter	Description	Value
Persistent Identifier (DOI)	DOI should be provided, if it exists	
Type of Source	The nature of the content of the source (Deliverable, publication, model etc.)	
Format of Source	Referring to the format of the source (.docx, .xlsx, .m, .slx, etc.)	
Related Material	Related publications, datasets, deliverables, etc.	
Documentation	Information for access and re-use of the source	
Production – Processing Software	Software used to generate the source	
Access Software	Necessary software to access the source	
Repository	The trusted repository the source can be found	
Dissemination Level	Public / Sensitive	
Access Rights	Information about the access rights and restrictions associated with the source	
Protection Measure	Measures to ensure correct handling of the source	

5.2 Explanatory Section

This section explains the meaning and purpose of each parameter presented in Table 1.

Author: Attributed to the person primarily responsible for the corresponding source. Only one should be listed as main author, to ensure ownership and responsibility. The organization should also be mentioned in parenthesis & the ORCID ID number of the author.

Organization: Main organization responsible for developing the source. Usually author's organization. Also, ROR (Research Organization Registry) should be provided if available.

Contact Person: The assigned person who can provide further information and support about the source. The person usually is the main author, but this is not mandatory. The name of the person and their email should be displayed.

Contributors: Any other individuals, institutions, or organizations that participated in creating, processing, or modifying the source. Contributors may include co-authors, technicians, software developers, etc. The organization of every contributor and the ORCID number should be provided.

Contributing Organizations: Any other organizations that participated during the development of the source. Also, ROR (Research Organization Registry) identifier should be provided if available for each one of them.

Title: The title of the source, as attributed by the author.

Date: The date when the source was officially shared with the consortium or uploaded to the repository. This date may differ from the creation date and is important for documenting when the source became available to other project partners.

Version: Indicates the current state of the source. It can be "Ongoing" (v0.x) for work-in-progress data, "Final" (v1.0) if completed. This field helps users understand whether the source is stable or subject to further updates.

Description: A detailed description of the source. It must include information on the origin of the data (e.g., publication, model, deliverable, dataset, etc.), the software and/or hardware used to generate it, and the format of the resulting files.

Keywords: A list of descriptive terms that support discovery and indexing of the source. Keywords should be carefully chosen to capture the main themes, content, or methods used in the source.

Validation/ Verification: Individuals or entities who reviewed or validated the source. This may include internal quality checks, peer reviewers, or assigned deliverable reviewers

Specific Identifier: A unique structured identifier (filename) for the source following the agreed convention:

- If the generated source is a deliverable: FLEETfor55_CorrespondingDeliverable_Version
- For any other type of generated source: PartnerName_CorrespondingWP_CorrespondingTask_TitleInitials_Version_Date.

This ensures that every source can be traced back to its origin, the related work package, and task. Version v1.0 refers to the final version, while v0.x refers to all the earlier versions. For example: UPAT_WP2_T2.5_DSS_v0.1_2025-10-06, refers to an early version of the decision support system.

Persistent Identifier: If available, provide a DOI (Digital Object Identifier) or other persistent identifier assigned to the source. If not applicable, indicate N/A.

Type of Source: A general categorization of the source, such as Deliverable, Publication, Model, Dataset, or Software.

Format of Source: The technical file formats of the source (e.g., .docx, .xlsx, .csv, .m, .slx, .hdf5). File format information is critical for ensuring that others can open and reuse the source with appropriate tools.

Related Material: References to documents, deliverables, publications, or other documents that are connected to the source. This field helps link the source to related project outputs or external material for better context and traceability. Provide the references with the persistent identifier attached (usually Digital Object Identifier - DOI).

Documentation: Information provided to support the re-use of the source. This can include methodology notes, data dictionaries, codebooks, or any additional description that explains how to interpret and work with the data.

Production – Processing Software: The software used to generate the source, including the name and version if possible (e.g., MATLAB R2023b, LAMMPS 3Mar20, Python 3.12, etc.).

Access Software: The software required to access, view, or use the source. This may include common tools (Excel, Python) or specialized programs (e.g., OVITO, AMESim). Listing access software ensures the consortium can open and work with the source as intended.

Repository: The trusted repositories used to store the source. This may include internal project repositories (Microsoft Teams), institutional data servers, or external repositories (Zenodo).

Dissemination Level: If the developed source corresponds to a deliverable specify if the deliverable is Public (freely available) or Sensitive (restricted to certain users or consortium members only).

Access Rights: Defines the level of access provided with the sources being either a) Closed: where only metadata or executive summary is available, not the full source, b) Read-only: where the source can be accessed and used but not modified & c) Editable where the source can be fully accessed and modified by authorized users. Furthermore, the license of the source can be provided (CC BY, CC BY-SA, CC BY-NC, CC BY-NC-SA, CC BY-ND, CC BY-NC-ND, CC0).

Protection Measures: This field describes any measures that are applied to ensure the protection of the source (intellectual property rights, data protection regulations (GDPR), confidentiality, etc.).

5.3 Project Summary

FLEETfor55 is an ambitious project to align the European waterborne sector with the EU's "Fit for 55" environmental targets for 2030. The project studies more than 60 Energy Efficiency Technologies (EETs), with the target of identifying the most cost effective and sustainable implementation, across three major ship categories – onboard short sea, inland waterway and high seas vessels. To accomplish this, EETs will be paired with new vessel designs and retrofits – defined as use cases. A decision support system (DSS) will be developed to assess the use cases, the energy efficiency and the reduced emissions.

The FLEETfor55 project is co-funded by the European Union. General information about the project is provided in Table 8:.

Table 8: Project Summary

Project number:	101192661
Project name:	State-of-the-art sustainable energy efficiency technologies roadmap for waterborne transport towards the fit-for-55 guidance compliance
Call:	HORIZON-CL5-2024-D5-01
Project duration:	42 months

5.4 Metadata Description File - Disclaimers

According to Article 17 of the FLEETfor55 project's Grant Agreement states, metadata of deposited publications must be made openly available under a Creative Common Public Domain Dedication (CC0), in line with the FAIR principles and the European open science framework.

The person responsible for filling the Metadata Description File is encouraged to fill as many of the parameters as possible. Further information about the characteristics of metadata can be found in Deliverable 1.3.

Each "Metadata Description File" (MDF) must be stored in the same folder as its corresponding source file in the Teams Repository. The MDF filename shall be: <**Specific Identifier>_MDF**. As defined in chapter 2, the Specific Identifier is the exact name of the source in the FLEETfor55 Teams repository. For example, the deliverable D1.3 by UPAT, with the name FLEETfor55_D1.3_v1.0, will have a "Metadata Description File" in the same path (Documents > General > 06. WPs > WP1 > D1.3), with the name FLEETfor55_D1.3_v0.1_MDF.

6 References

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