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“D1.1 – Project Management Plan”

0 Document information

0.1 Project details

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Project Acronym	Hy4Smelt
Grant Agreement No.	101193416
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0.2 Document details

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1 Executive summary

This document represents deliverable D1.1 “Project management plan” of the RFCS project with the acronym Hy4Smelt. The objective of this document is to provide an overview of the efficient management of the project. The plan summarises the project and explains the designated work packages, tasks, milestones, and actions to reach the project goals. Through transparent governance, regular reporting, and structured quality assurance, the Project Management Plan serves as the foundation for a collaborative and results-oriented project environment.

2 Introduction

2.1 Purpose of this document

To achieve the project goals, the necessary work must be structured, roles and responsibilities defined, and the progress of the project monitored and controlled. Developing a project management plan helps ensuring the project remains on schedule. Key components include a clearly defined scope of work, a structured work plan, a well-detailed budget, a timeline with deliverables and milestones, and the tools necessary to support these management activities.

2.2 Abbreviations

Table 1 – Abbreviations

Abbreviation	Meaning
H_2	Hydrogen
CO_2	Carbon dioxide
FB	Fluidised Bed
DR	Direct Reduction
BF	Blast Furnace
BOF	Basic Oxygen Furnace
SC	Steering Committee
RFCS	Research Fund for Coal and Steel
WP	Work Packages
EU	European Union
HYFOR	Hydrogen based fine ore reduction
DEC	Dissemination, Exploitation and Communication

3 Project summary

The project Hy4Smelt demonstrates a breakthrough process of hydrogen-based, CO_2-neutral reduction and melting of non-agglomerated low/medium-grade iron ore, meeting objectives set by the EU on clean steel technologies, sustainability, and competitiveness (e.g. Green Deal, Fit for 55, REPowerEU). The Hy4Smelt industrial-scale demonstrator is first-of-its-kind worldwide in processing ultra-fine iron ores in an innovative fluidised bed (FB) direct reduction (DR) with 100 % green H_2 and melting the direct reduced iron in a renewable powered electric furnace (Smelter). The green hot metal is further processed to crude steel in an existing Basic Oxygen Furnace. The Hy4Smelt process offers highest flexibility in the use of iron ore grades that are not used for DR today. It is also in line with EU's zero-waste goal, as the Smelter slag will be qualified as a secondary, alternative raw material to Blast Furnace (BF) slag for the cement sector.

Hy4Smelt initiates a massive transformation to a H_2-based and circular steel sector. It establishes the EU as a leader for carbon neutral steelmaking and is best suited to qualify for the RFCS programme. Excellent consortium partners combine their outstanding know-how in iron ore processing, metallurgy, plant technology, and recycling in the cement sector together with highly skilled scientific partners. Hy4Smelt will enable the transformation of all steelmakers towards a H_2-based, sustainable and circular steel production, substantially reducing CO_2 emissions.

Hy4Smelt will raise awareness of the necessity that handling low grade ores for green hot metal production must be now scaled up to push forward the EU towards a resource-efficient and competitive economy. This disruptive technology shows enormous exploitation potential at an estimated market demand of 200 million tons of green hot metal per year and the capability of replacing current Sinter plant-BF route in integrated steel plants.

Figure 1 – Hy4Smelt Logo

4 Project management and coordination

Project management and coordination for the Hy4Smelt project focus on ensuring timely and cost-effective project delivery while maintaining efficient progress. This involves the coordination of administrative and financial aspects, continuous monitoring and evaluation of the impact/technical project content and ensuring to deliver high-quality work and reports throughout the project's duration.

4.1 Structure of the work plan

Hy4Smelt project includes 6 work packages (WPs). WP1 deals with project coordination and quality/risk management, while in WPs 2-3 focus is on plant and process engineering and the integration and linking of the core technology modules. WP4 encompasses all use-cases and testing scenarios, ranging from feed material to process optimisation. WP5 targets comprehensive result evaluation and exploitation including business case development. WP6 is dedicated to dissemination and communication activities.

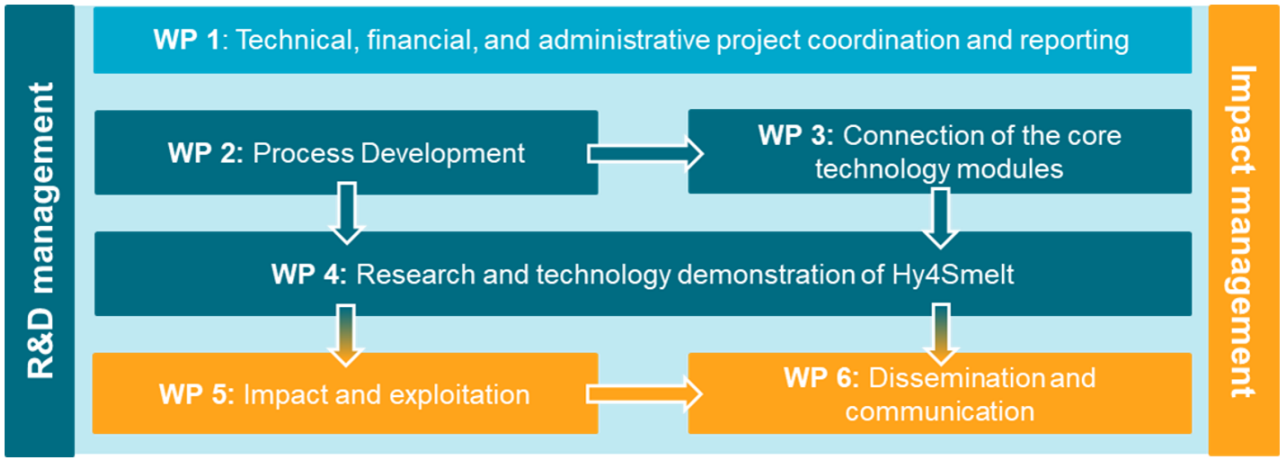


Figure 2 – Structure of the work plan

4.2 Area of application

Ensuring smooth and efficient project implementation requires regular communication between the partners and includes project activities, administration, and organisation of the management structure. The coordinator PTAT creates and maintains the project management plan and is responsible for progress monitoring, checking document consistency, organizing project meetings, creating and distributing meeting minutes of the consortium meetings, monitor and submit the reporting information. Quality control, risk management and data management will be subject of deliverable D1.2 “Data Management Plan” and D1.3 “Quality Management Plan”.

4.3 Partners and their role in the project

To achieve this great ambition an excellent consortium has been formed. All consortium partners play vital roles in the implementation of Hy4Smelt. The consortium consists of the following, highly experienced, European project partners representing the entire value chain:

Primetals Technologies Austria GmbH (PTAT) in plant engineering and building, voestalpine Stahl GmbH (VAS) in integrated steelmaking. The area of slag treatment is covered by Loesche GmbH (LOESCHE), cement testing and research by CEMEX ESPAÑA GESTIÓN Y SERVICIOS, S.L. (CEMEX) together with its affiliated company for cement production CEMEX Espana Operaciones. The excellent scientific partners offer expertise in metallurgical and environmental process development (K1-MET GmbH, K1-MET), metallurgy, direct reduction and hydrogen (University Salento, UNILE), Smelter slag analysis and certification (Bauhaus University Weimar, BUW), and process optimisation, control, monitoring and management, sustainability as well as impact analyses (Scuola Superiore Sant’Anna, SSSA). The European Steel Technology Platform (ESTEP) represents the main networking platform for comprehensive activities on dissemination, exploitation, and communication (DEC). An overview of each role in the methodology is shown in following figure:

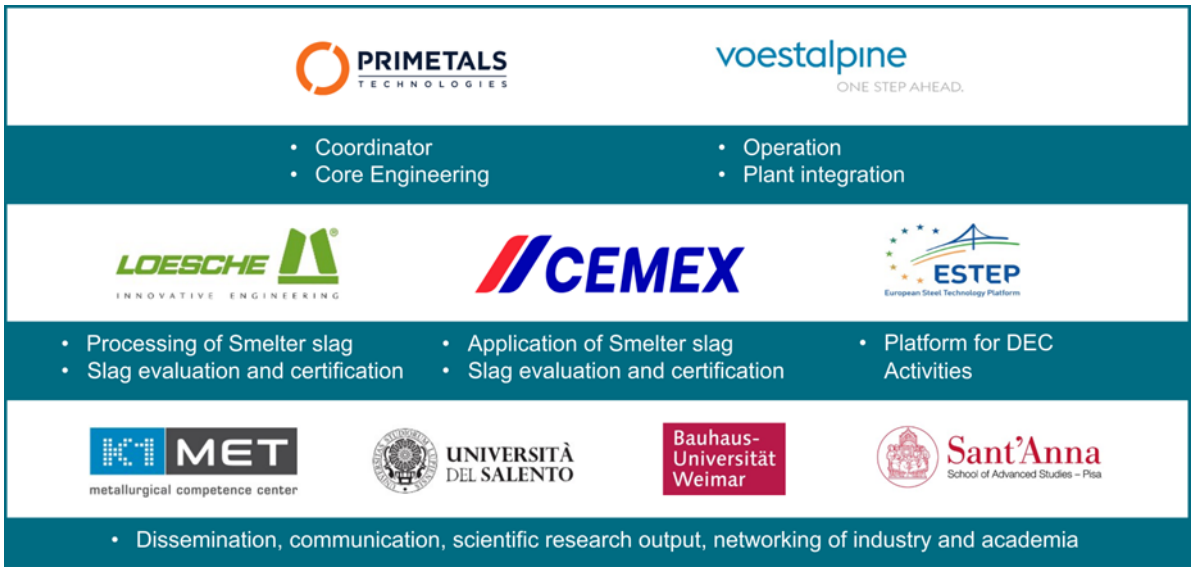


Figure 3 – Overview of consortium

Table 2 – Allocation of partner activities

Partner	Main roles	Position in value chain	Provided infrastructure/know how
PTAT (AUT)	Project management, plant, process design and technology provider	Engineering and plant construction for steelmaking	Access to the HYFOR pilot plant. Engineering, process optimisation.
VAS (AUT)	Plant operation	Steel and green hydrogen production	Media supply, plant site, up- and downstream infrastructure and laboratories for resource and product analysis. Operating personnel with BF experience, R&D technicians.
LOESCHE (GER)	Slag processing	Engineering and plant construction for material processing	Compact Cement Grinding plant. Know-how in slag processing.
CEMEX (ESP)	Slag analysis and certification	Cement producer	Knowledge in utilising slag as an input stream and slag certification.
K1-MET (AUT)	Dissemination (public)	Research and technology organisation	Experience in DEC activities and open science practices within EU and nationally funded research projects. Support with metallurgical process analyses.
UNILE (ITA)	Dissemination (academic)	University	Laboratories for metallurgical analyses Deep knowledge in hydrogen-based reduction. Experience with scientific publications and open science practices.
BUW (GER)	Slag analysis	University	Laboratories for slag certification.
SSSA (ITA)	LCA and LCC	University	Long experience with LCA, LCC and dissemination and open science practices.
ESTEP (BEL)	Communication & dissemination	Technology platform	Established platform for dissemination and communication within the EU steel sector

5 Work plan – implementation and control

A work plan has been established in which the work packages, tasks, deliverables and milestones are specified and assigned to a responsible partner. A detailed Action plan with all ongoing and planned actions of the first 6 months within a task has been created, and an example is shown in Table 4 in Annexes.

5.1 Controlling

Partners have been nominated to be responsible for specific work packages. Each partner always has the responsibility to oversee the planning and execution of their own work, and to contact the task-/WP-leader or coordinator when there is need for further information to carry out the tasks. Furthermore, it is the duty of the WP/task-leader to support all partners working in their area to achieve the project goals.

The coordinator ensures and monitors the proper implementation of the action. Therefore, status meetings with the entire consortium will take place every three months. At these meetings, the progress of the work in each work package and task will be evaluated, and the next steps will be planned.

5.2 Deliverables

Deliverables represent the work done within the framework of one or sometimes several task(s) and provide a clear overview of the activities carried out and the results achieved. Table 3 in Annexes lists the deliverables, the lead beneficiary, type, dissemination level and due date. Each deliverable has a lead beneficiary who is responsible for the preparation and completion of the deliverable. Partners involved in relevant work for the deliverable contribute to its reporting. The steering committee is responsible for the internal reviewing process, while the coordinator approves and uploads the final report.

5.3 Milestones

Milestones mark key points in the project timeline that reflect critical achievements necessary for the successful progression of the work**.** Table 4 in Annexes lists the project milestones, indicating their associated work package (WP), the lead partner responsible, the means of verification, and the due date. Each milestone has a designated lead beneficiary who ensures its timely achievement and documentation. All relevant partners contribute to reaching the milestone as foreseen in the work plan. The steering committee monitors milestone completion and ensures alignment with the overall project objectives, while the coordinator oversees the process and confirms milestone fulfilment in line with the project schedule.

5.4 Project timeline

The project timeline provides a comprehensive overview of the start and end dates of all tasks and work packages, ensuring clarity and structure throughout the implementation period. A detailed schedule is included in Annex 8.3. The timeline serves as a critical management tool, supporting coordination among partners, tracking progress, and identifying potential delays at an early stage. To ensure its accuracy and relevance, the schedule is maintained and regularly updated by a dedicated project scheduler. Adherence to the timeline is essential for the timely delivery of results and the overall success of the project.

5.5 Project action plan

A central Action Plan is maintained by the project coordinator to ensure effective monitoring and timely implementation of all project activities. This plan is managed in the form of an Excel-based to-do list and is accessible to all partners via the shared Microsoft Teams environment. It includes all key elements necessary for structured project tracking, such as task description, responsible partner or individual, detailed action item, deadline, current status, and progress notes. The Action Plan is regularly updated to reflect the current status of activities and serves as a practical tool for coordination, prioritization, and follow-up during project meetings. It supports transparency and accountability across the consortium and ensures that responsibilities and timelines are clearly defined and monitored throughout the project lifecycle.

5.6 Steering Committee

The Steering Committee (SC) is composed of one representative from each project partner and serves as a central governance body. The SC plays a vital role in ensuring that the project progresses according to plan, meets its objectives, and maintains high standards of quality and coherence across all activities. One of its core responsibilities is the internal review of deliverables. This includes verifying their consistency with the project goals, assessing the scientific and technical quality, and ensuring that the outputs meet the expected standards prior to submission

6 Tools supporting project management, knowledge transfer and communication

Various tools will be used to ensure the work progress and evaluate it regarding quality, time and costs. The Gantt chart, the list of deliverables and milestones (see Annexes) as well as the MS Teams SharePoint have already been established.

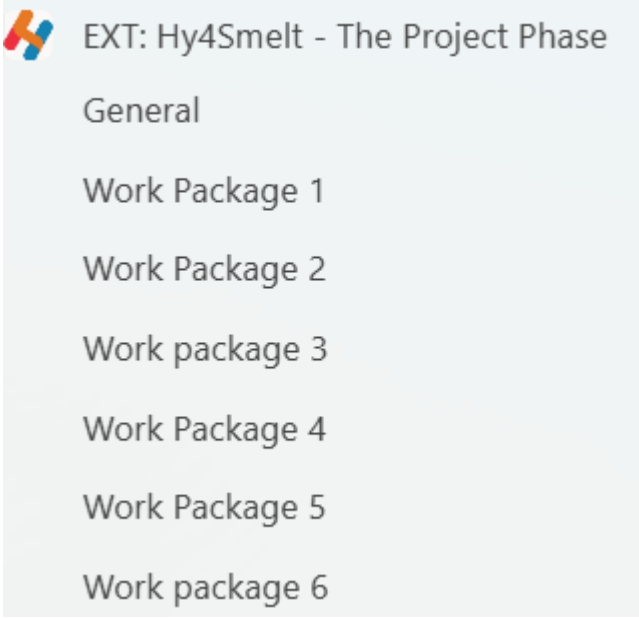


Figure 4 – Overview of MS Teams structure

6.1 Communication

A MS Teams SharePoint is used for sharing documents, data and pictures, both work in progress and completed deliverables. A contact list can be accessed by each participant. Each partner is responsible for keeping the contact list up to date.

External (public) communication is specified in the Dissemination and Communication plan, deliverable D6.1. All information shared in the project has to be treated as confidential information and consent is needed before disseminating results.

To support external communication and dissemination activities, a project website will be established, providing general information about the project, its objectives, progress, and key outcomes. The website will serve as a central access point for stakeholders, policymakers, industry representatives, and the broader public. In addition, a dedicated LinkedIn channel will be maintained to share updates, promote events, and increase the visibility of the project within the professional community. Both platforms will be regularly updated and managed to ensure consistent, accessible, and timely communication throughout the project duration.

7 Conclusions

This deliverable provides the foundation for the execution of the project due to the procedures described. The project management plan is designed to support all partners in collaboratively achieving the project goals while ensuring a consistent and effective management of the activities. The procedure for the initiation of work, as well as the timeline and responsibilities for deliverable preparation and completion, have been outlined. The expertise and work of the project partners in the Hy4Smelt project can unfold efficiently if they follow the work plan at different levels of detail.

8 Annexes

8.1 Annex 1 – Deliverables

Table 3 – List of Deliverables

No.	Deliverable Name	WP No.	Lead	Type	Dissemination Level	Due
D1.1	Project Management Plan	WP1	1 - PTAT	R — Document, report	PU - Public	2
D1.2	Data Management Plan	WP1	1 - PTAT	DMP — Data Management Plan	PU - Public	3
D1.3	Quality Management Plan	WP1	1 - PTAT	R — Document, report	PU - Public	4
D2.1	Hy4Smelt use case specifications	WP2	3 - VAS	R — Document, report	PU - Public	3
D2.2	List of KPIs	WP2	2 - K1-MET	R — Document, report	PU - Public	4
D2.3	Report about detail engineering and Hy4Smelt process design	WP2	1 - PTAT	R — Document, report	SEN - Sensitive	8
D3.1	Hy4Smelt cross-linking and digitalisation report	WP3	1 - PTAT	R — Document, report	PU - Public	18
D3.2	Hy4Smelt cold and hot testing report	WP3	3 - VAS	R — Document, report	PU - Public	24
D3.3	Hy4Smelt demonstrator	WP3	3 - VAS	DEM — Demonstrator, pilot, prototype	PU - Public	24
D4.1	Report about ramp-up phase	WP4	1 - PTAT	R — Document, report	PU - Public	31
D4.2	Sensitivity analyses on use of secondary carbon	WP4	2 - K1-MET	R — Document, report	PU - Public	39
D4.3	Report about product quality	WP4	7 - BUW	R — Document, report	PU - Public	42
D4.4	Hy4Smelt report about first 4 use cases	WP4	3 - VAS	R — Document, report	PU - Public	45
D4.5	Hy4Smelt report about last 3 use cases	WP4	3 - VAS	R — Document, report	PU - Public	51
D5.1	Hy4Smelt replication scenario and preliminary LCA	WP5	2 - K1-MET	R — Document, report	PU - Public	18
D5.2	Public Hy4Smelt performance report	WP5	2 - K1-MET	R — Document, report	PU - Public	50
D5.3	Hy4Smelt performance report	WP5	3 - VAS	R — Document, report	SEN - Sensitive	52
D5.4	Results of LCA and LCC	WP5	8 - SSSA	R — Document, report	PU - Public	52
D5.5	Hy4Smelt business case	WP5	1 - PTAT	R — Document, report	SEN - Sensitive	54
D5.6	Exploitation strategy	WP5	2 - K1-MET	R — Document, report	PU - Public	17
D6.1	Communication and dissemination plan	WP6	5 - UNILE	R — Document, report	PU - Public	6
D6.2	Project website	WP6	1 - PTAT	DEC — Websites, patent filings, videos, etc.	PU - Public	7
D6.3	Report on DC activities	WP6	5 - UNILE	R — Document, report	PU - Public	12
D6.4	Successful startup ceremony	WP6	2 - K1-MET	R — Document, report	PU - Public	24
D6.5	Comprehensive overview of the project	WP6	1 - PTAT	R — Document, report	PU - Public	6
D6.6	Public publishable report	WP6	1 - PTAT	R — Document, report	PU - Public	52

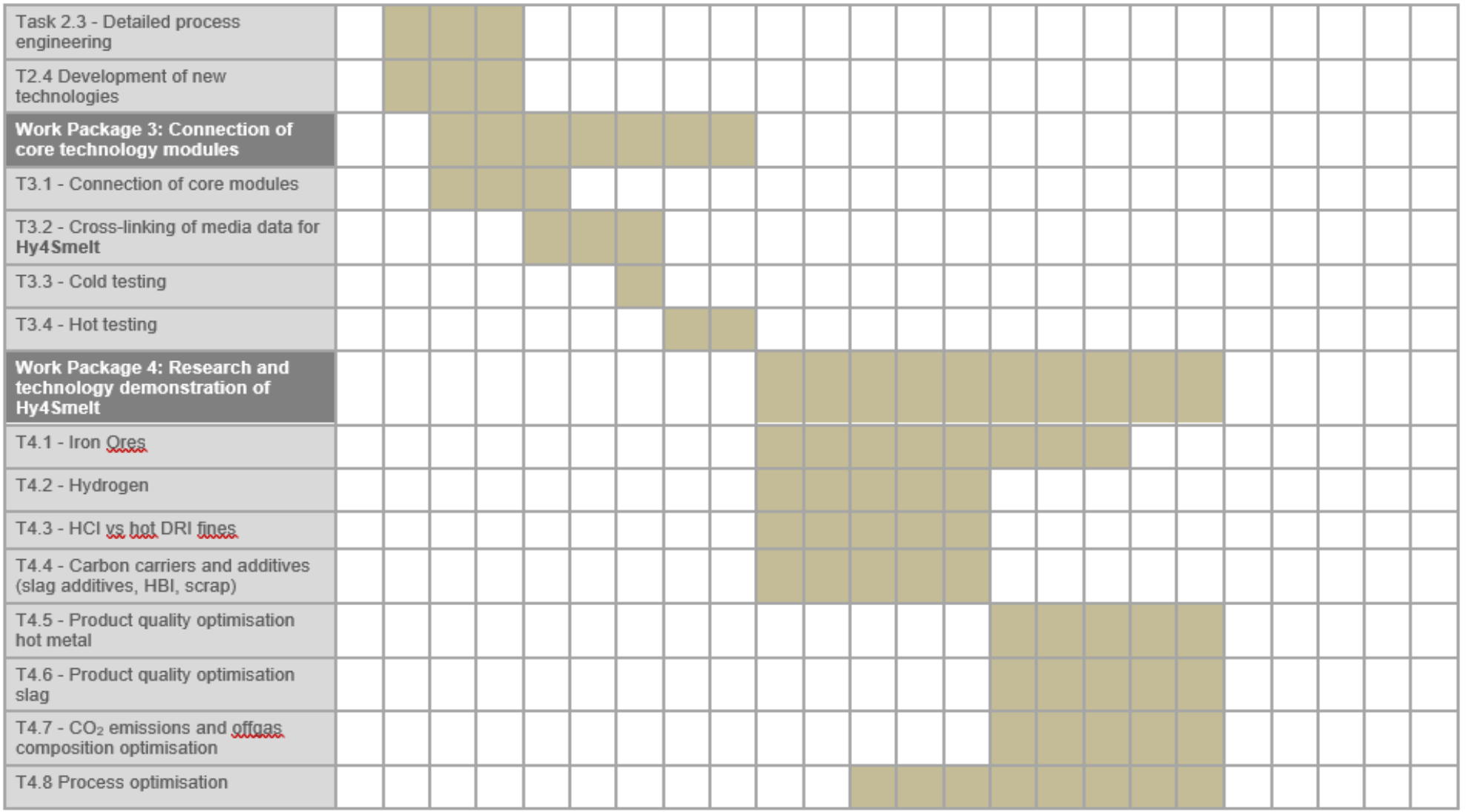
8.2 Annex 2 – Milestones

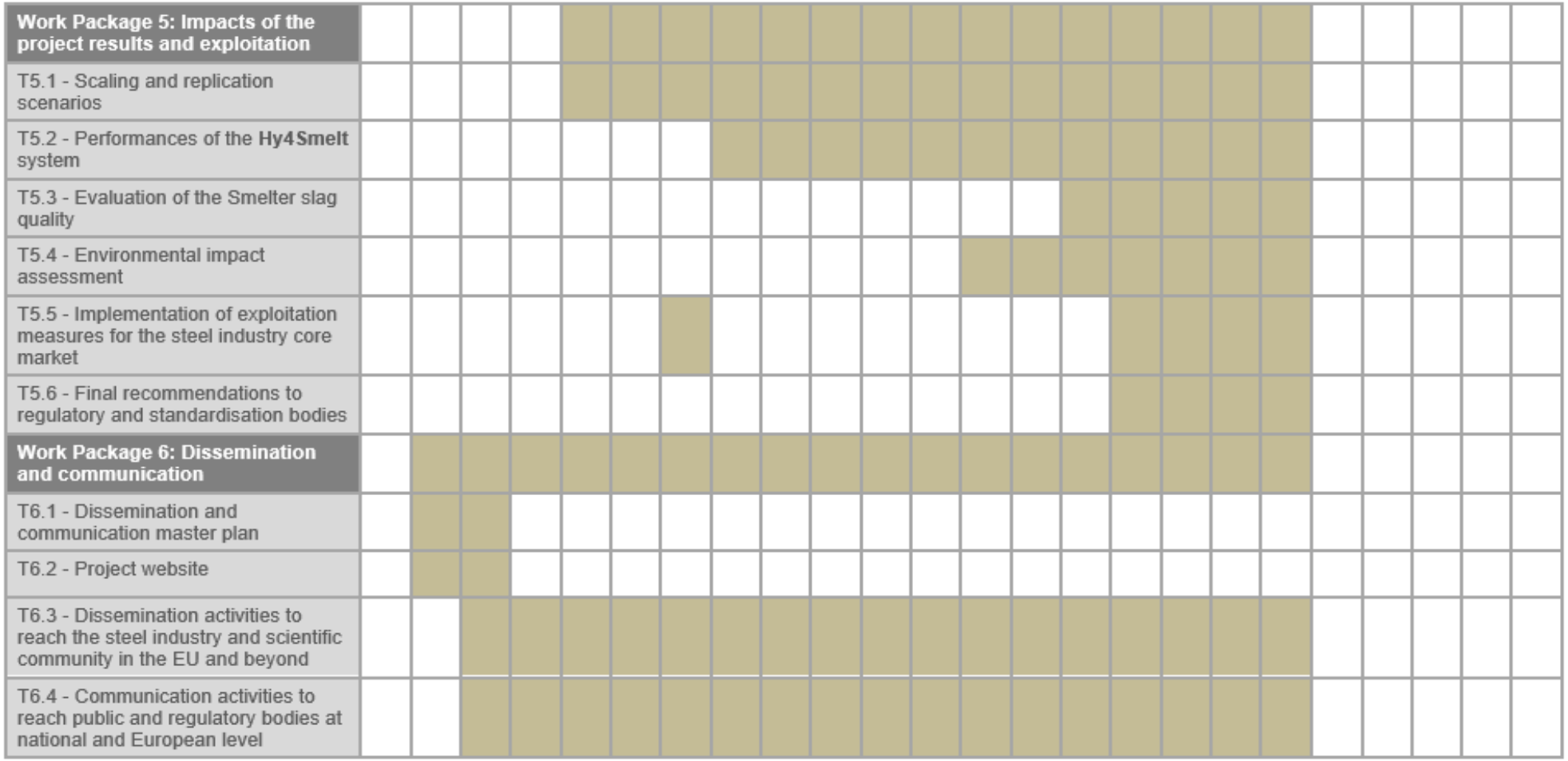
Table 4 – List of Milestones

No.	Milestone Name	WP	Lead	Means of Verification	Due
1	Management plans (project, data, quality) available	WP1	1 - PTAT	Deliverables D1.1-D1.3 approved by Steering Committee (SC)	4
2	Mid-term meeting held	WP1	1 - PTAT	Meeting minutes & updated D1.1 approved by SC	27
3	Use cases and KPIs defined	WP2	3 - VAS	D2.1/D2.2 approved by SC	4
4	Engineering and technological preparation complete	WP2	1 - PTAT	D2.3 approved by SC	8
5	Hy4Smelt integration and digitalisation	WP3	3 - VAS	D3.1 approved by SC	18
6	Hy4Smelt plant tested	WP3	3 - VAS	Hy4Smelt cold and hot testing successful and plant ready for R&D WP4	24
7	Nominal capacity achieved	WP4	3 - VAS	D4.1 approved	32
8	First use case complete	WP4	3 - VAS	D4.2 approved	33
9	WP4 halfway point	WP4	3 - VAS	D4.2/D4.3 approved and steel grade quality analysed	39
10	WP4 complete	WP4	3 - VAS	Hy4Smelt part of VAS production line, D4.5 approved	51
11	Hy4Smelt replication scenario defined	WP5	2 - K1-MET	D5.1 approved by SC	15
12	Draft exploitation strategy available	WP5	2 - K1-MET	D5.6 approved by SC	17
13	Life Cycle assessment finished	WP5	8 - SSSA	D5.4 approved by SC	52
14	DC plan	WP6	5 - UNILE	D6.1 approved by SC	4
15	Website online	WP6	1 - PTAT	Contents approved by SC and website online	7
16	Mid-term DC performance evaluated	WP6	5 - UNILE	Papers and DC activity reports publicly available	27
17	Project results disseminated	WP6	5 - UNILE	DEC activities performed and publicly reported	54

8.3 Gantt chart

ACTIVITY	YEAR 1 2025				YEAR 2 2026				YEAR 3 2027				YEAR 4 2028				YEAR 5 2029				YEAR 6			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
WP1 - Technical, financial, and administrative project coordination and reporting																								
Task 1.1 - Coordination, organisation and communication																								
Task 1.2 - Technical and administrative assistance and reporting																								
Task 1.3 - Meetings and interactions with the EC																								
Task 1.4 - Quality Management																								
WP2 - Process development																								
Task 2.1 - Finalisation of **Hy4Smelt** technological preparation, mass and energy balance and use cases																								
Task 2.2 - Definition of the Key Performance Indicators																								


Task 2.3 - Detailed process engineering
T2.4 Development of new technologies
Work Package 3: Connection of core technology modules
T3.1 - Connection of core modules
T3.2 - Cross-linking of media data for Hy4Smelt
T3.3 - Cold testing
T3.4 - Hot testing
Work Package 4: Research and technology demonstration of Hy4Smelt
T4.1 - Iron Ores
T4.2 - Hydrogen
T4.3 - HCl vs hot DRI fines
T4.4 - Carbon carriers and additives (slag additives, HBI, scrap)
T4.5 - Product quality optimisation hot metal
T4.6 - Product quality optimisation slag
T4.7 - CO_2 emissions and offgas composition optimisation
T4.8 Process optimisation


Work Package 5: Impacts of the project results and exploitation
T5.1 - Scaling and replication scenarios
T5.2 - Performances of the Hy4Smelt system
T5.3 - Evaluation of the Smelter slag quality
T5.4 - Environmental impact assessment
T5.5 - Implementation of exploitation measures for the steel industry core market
T5.6 - Final recommendations to regulatory and standardisation bodies
Work Package 6: Dissemination and communication
T6.1 - Dissemination and communication master plan
T6.2 - Project website
T6.3 - Dissemination activities to reach the steel industry and scientific community in the EU and beyond
T6.4 - Communication activities to reach public and regulatory bodies at national and European level