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“D1.1 – Project Management Plan”

0 Document information

0.1 Project details

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Project Acronym	InduGasHeat
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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 InduGasHeat. 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
UHT-TJ	Ultra-High Temperature Thermo-Jet
CO_2	Carbon dioxide
SC	Steering Committee
RFCS	Research Fund for Coal and Steel
WP	Work Packages
EU	European Union
DEC	Dissemination, Exploitation and Communication
TRL	Technology Readiness Level

3 Project summary

The European Union aims to achieve climate neutrality by 2050, which requires significant changes in energy-intensive sectors such as steel production. The steel industry, responsible for approximately 8% of global carbon emissions, faces the dual challenge of adapting to climate targets while maintaining competitiveness. Green solutions exist for the main production process. In auxiliary processes, there is still large potential for decarbonisation. The research project InduGasHeat proposes the implementation of Ultra-High Temperature Thermo-Jet (UHT-TJ) induction-based gas heating systems and aims to test this technology by replacing fossil fuel burners in two key applications: heating furnaces for forging processes (Use Case 1) and ladle preheating stations (Use Case 2).

The project aims to develop and demonstrate a plug-and-play solution that can reach higher gas temperatures than existing electrical gas heating units, and better efficiency than hydrogen burners. By increasing furnace heating efficiency by 10 to 15%, the project targets a 35% reduction in CO_2 emissions in Use Case 1. Additionally, the use of electric heating will result in a 100% reduction in direct CO_2 emissions for ladle preheating (Use Case 2). The project seeks to achieve market readiness by reaching Technology Readiness Level (TRL) 8 for both applications. The UHT-TJ will provide a flexible and cost-effective solution for upgrades in existing infrastructure and new steel producing plants. Furthermore, the potential for cross-sectoral application in industries such as non-ferrous metals, glass, and ceramics will be explored.

This project aligns with EU policies and strategic objectives, contributing to the Green Deal, REPowerEU, and the Clean Steel Partnership. By addressing these challenges and achieving its goals, the project aims to significantly reduce carbon emissions, enhance energy efficiency, and promote sustainable industrial practices across Europe and globally.

Figure 1 – InduGasHeat Logo

4 Project management and coordination

Project management and coordination for the InduGasHeat 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

InduGasHeat includes 7 work packages (WPs). WP1 deals with project coordination and quality/risk management, while the core technical work is developed in WPs 2-6, combining system modelling and engineering as well as prototype production including a test phase for both use cases. WP7 is dedicated to dissemination, communication, and exploitation activities, including business case development.

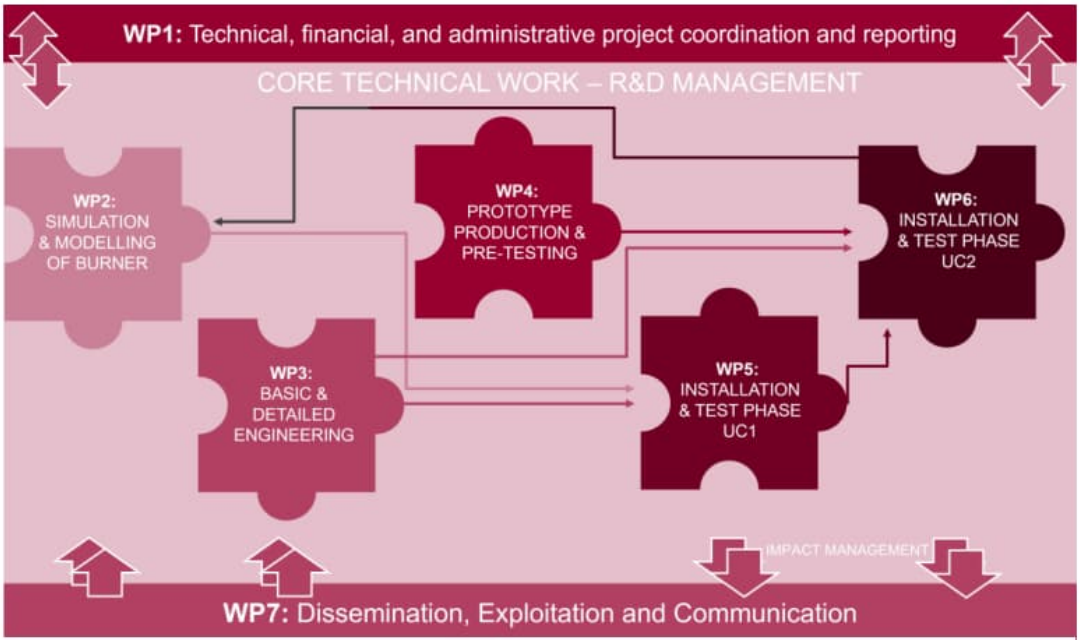


Figure 2 – Structure of the work plan

WP	Name	Lead
1	Technical, financial, and administrative project coordination and reporting	PTAT
2	Simulation, modelling and small-scale testing of burner and overall system	BAF
3	Basic and detailed engineering of burner and control system	ABP
4	Prototype production and pre-testing	PTAT
5	Installation of prototypes and test phase - Use Case 1	BGH
6	Installation of prototypes and test phase - Use Case 2	ESF
7	Dissemination, Exploitation and Communication	BAF

Figure 3 – Leads of Work Packages

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 InduGasHeat. The consortium is given in Figure 4 and consists of the following, highly experienced, European project partners representing the entire value chain:

PTAT, a globally experienced plant engineering company with extensive project management expertise, will ensure efficient coordination and execution of the project. **BGH**, a seasoned plant operator with significant experience in system testing, will play a key role in the prototyping and testing phase, alongside **ESF**, another expert plant operator with a deep understanding of testing systems, further strengthening this critical stage. **ABP**, an expert in inductive applications, will take the lead in designing and building the inductive gas heaters, which are the core innovation of the project. Meanwhile, **BAF**, an academic partner with vast experience in both fundamental and applied research, will provide the scientific foundations necessary for the project’s success. Finally, **PTDE**, a global leader in automation for plant engineering, will ensure that the automation systems are seamlessly integrated.

Together, this consortium covers all the necessary expertise, from fundamental research and inductive heating technology to comprehensive prototyping, testing, and automation. These partners are well-positioned to deliver innovative, high-impact results that align with the project’s ambitious objectives.

Number	Role	Short name	Legal name	Country	PIC
1	COO	PTAT	PRIMETALS TECHNOLOGIES AUSTRIA GMBH	AT	932123732
1.1	AE	ABP	ABP INDUCTION SYSTEMS GMBH	DE	960864250
1.2	AE	PTDE	Primetals Technologies Germany GmbH	DE	875769836
2	BEN	ESF	ESF ELBE-STAHLWERKE FERALPI GMBH	DE	960524459
3	BEN	BAF	TECHNISCHE UNIVERSITAET BERGAKADEMIE FREIBERG	DE	999583934
4	BEN	BGH	BGH EDELSTAHL SIEGEN GMBH	DE	876707923

Figure 4 – Overview of consortium

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.

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.

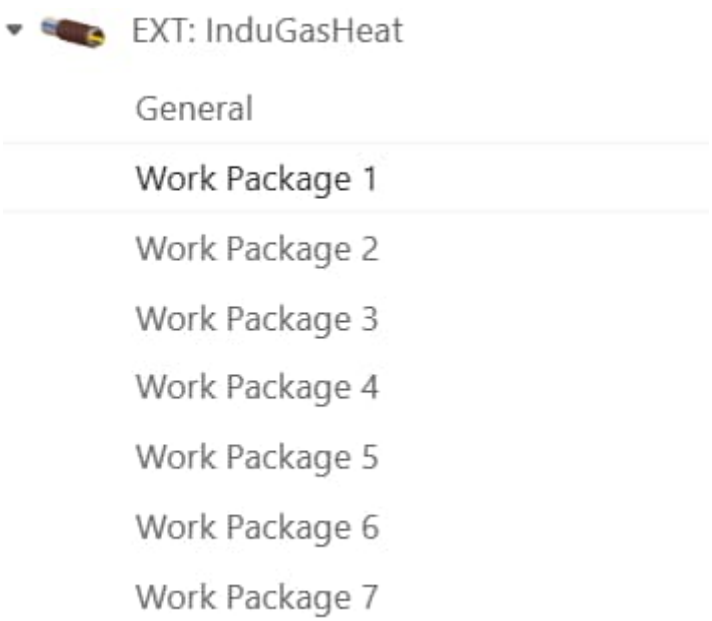


Figure 5 – Overview of MS Teams structure

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 D7.1. 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 InduGasHeat project can unfold efficiently if they follow the work plan at different levels of detail.

8 Annexes

8.1 Annex 1 – Deliverables

Table 2 – List of Deliverables

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Project Management Plan	WP1	1 - PTAT	R — Document, report	PU - Public	2
D1.2	Data Management Plan	WP1	1 - PTAT	R — Document, report	PU - Public	3
D1.3	Quality Management Plan	WP1	1 - PTAT	R — Document, report	PU - Public	4
D2.1	Report about core components for the susceptor and isolation as well as electromagnetic, susceptor and tube design, including monitoring and control system	WP2	3 - BAF	R — Document, report	SEN - Sensitive	14
D2.2	Digital control unit of the high power and frequency converter	WP2	1.1 - ABP	DEM — Demonstrator, pilot, prototype	SEN - Sensitive	24
D2.3	All simulations validated	WP2	3 - BAF	R — Document, report	PU - Public	40
D3.1	Detailed drawings of the torch for UC1	WP3	1 - PTAT	R — Document, report	SEN - Sensitive	17
D3.2	Detailed drawings of the torch for UC2 and the converter unit including test report	WP3	1 - PTAT	R — Document, report	SEN - Sensitive	30
D4.1	Demonstrator manufacturing complete	WP4	1 - PTAT	DEM — Demonstrator, pilot, prototype	SEN - Sensitive	27
D4.2	Report about pre-testing 200 kw prototype	WP4	3 - BAF	R — Document, report	SEN - Sensitive	28
D5.1	Demonstrator furnace available	WP5	4 - BGH	DEM — Demonstrator, pilot, prototype	SEN - Sensitive	25
D5.2	Data report on test runs	WP5	4 - BGH	R — Document, report	SEN - Sensitive	30
D5.3	Report about final system improvements	WP5	3 - BAF	R — Document, report	SEN - Sensitive	32
D6.1	Report on installation and preparation works as well as heating trials, including media usage and process control description	WP6	2 - ESF	R — Document, report	SEN - Sensitive	40
D7.1	Communication and dissemenation plan	WP7	3 - BAF	R — Document, report	PU - Public	6
D7.2	Final report on KPIs and technical progress	WP7	1 - PTAT	R — Document, report	SEN - Sensitive	42
D7.3	InduGasHeat Exploitation strategy & Business Case	WP7	1 - PTAT	R — Document, report	SEN - Sensitive	42
D7.4	Comprehensive overview	WP7	1 - PTAT	R — Document, report	PU - Public	6
D7.5	Publishable Report	WP7	1 - PTAT	R — Document, report	PU - Public	42

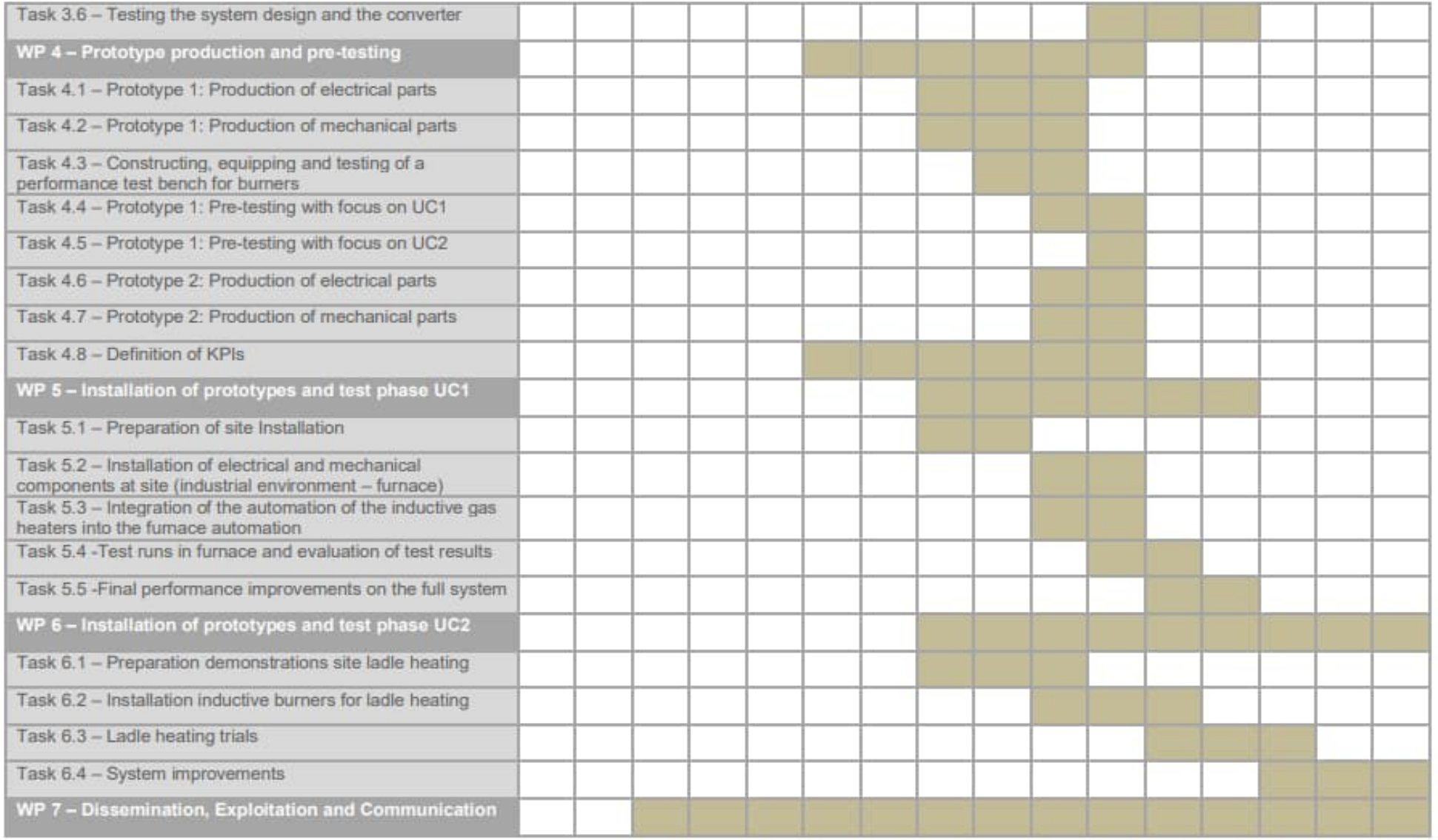
8.2 Annex 2 – Milestones

Table 3 – List of Milestones

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	Kick-Off Meeting held	WP1	1 - PTAT	Minutes of Meeting	3
2	Electromagnetic / susceptor and tube design finished for UC1	WP2	1.1 - ABP	D2.1 approved by all partners	5
3	Electromagnetic / susceptor and tube design finished for UC2	WP2	3 - BAF	D2.1 approved by all partners	14
4	Engineering of the torch for UC1 finished	WP3	1.1 - ABP	D3.1 approved by all partners and ready to transfer to manufacturer(s)	17
5	Engineering of the torch for UC2 finished	WP3	1.1 - ABP	D3.2 approved by all partners and ready to transfer to manufacturer(s)	23
6	Inductive gas heater 200 kW fully demonstrated	WP4	1 - PTAT	D4.1 approved for UC1 by all partners	24
7	Test of smaller scaled ladle pre-heating environment successfully completed	WP4	3 - BAF	D4.1 approved for UC2 by all partners	26
8	Test runs at furnace successfully completed	WP5	4 - BGH	D5.2 approved by all partners	30
9	Feedback documents compiled and ready to conduct optimization steps	WP5	3 - BAF	D5.3 processed	32
10	Demosite preparation and media supply ready to use	WP6	2 - ESF	Finalised installation of all relevant supplies at demosites & D6.1. approved by all partners	22
11	Installation of new burner realized	WP6	1 - PTAT	D6.1 approved by all partners	28
12	Mid-term workshop executed	WP7	3 - BAF	Detailed programme of the workshop and proceedings (collection of presentations) released and publicly available on the project website aligned with D7.1	21
13	Final workshop executed	WP7	3 - BAF	Detailed programme of the workshop and proceedings (collection of presentations) released and publicly available on the project website aligned with D7.1	42

8.3 Annex 3 - Gantt chart

ACTIVITY	YEAR 1				YEAR 2				YEAR 3				YEAR 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
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																
WP 2 – Simulation, modelling and small-scale testing of burner and overall system																
Task 2.1 - Supplementary tests on potential materials and small-scale components for the induction gas heating unit																
Task 2.2 – Electromagnetic simulations of induction system																
Task 2.3 – Simulation of the heat transfer and gas dynamics in the inductive gas heating unit																
Task 2.4 – Design and simulation of the automation system and safety concept																
Task 2.5 – Validation of simulations and comparison with results from test benches and the data from the use cases																
Task 2.6 – Basic Engineering of a digital control unit for the high frequency power converter																
WP 3 – Basic and detailed engineering of burner and control system																
Task 3.1 – Basic engineering of induction system																
Task 3.2 - Basic engineering of the gas flow section (susceptor and surrounding)																
Task 3.3 – Design of gas recirculation tubes and fan																
Task 3.4 – Development of automation concept for the unit																
Task 3.5 – Integration system design into an industrial set-up (furnace and ladle preheating																


Task 3.6 – Testing the system design and the converter
WP 4 – Prototype production and pre-testing
Task 4.1 – Prototype 1: Production of electrical parts
Task 4.2 – Prototype 1: Production of mechanical parts
Task 4.3 – Constructing, equipping and testing of a performance test bench for burners
Task 4.4 – Prototype 1: Pre-testing with focus on UC1
Task 4.5 – Prototype 1: Pre-testing with focus on UC2
Task 4.6 – Prototype 2: Production of electrical parts
Task 4.7 – Prototype 2: Production of mechanical parts
Task 4.8 – Definition of KPIs
WP 5 – Installation of prototypes and test phase UC1
Task 5.1 – Preparation of site Installation
Task 5.2 – Installation of electrical and mechanical components at site (industrial environment – furnace)
Task 5.3 – Integration of the automation of the inductive gas heaters into the furnace automation
Task 5.4 -Test runs in furnace and evaluation of test results
Task 5.5 -Final performance improvements on the full system
WP 6 – Installation of prototypes and test phase UC2
Task 6.1 – Preparation demonstrations site ladle heating
Task 6.2 – Installation inductive burners for ladle heating
Task 6.3 – Ladle heating trials
Task 6.4 – System improvements
WP 7 – Dissemination, Exploitation and Communication

Task 7-1 – Plan for Dissemination, Exploitation and Communication																
Task 7-2 – Market analysis and Exploitation activities																
Task 7-3 – IPR Management																
Task 7-4 – Dissemination and Communication activities																
Task 7-5 – Controlling of technical progress																