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DTT Work-programme and Budget 2025				
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Abstract	<i>The present report describes the DTT Consortium work programme and defines the relevant budget for the</i>			

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Acronyms and abbreviations

BOP	Balance of Plant
CODAS	Control & Data Acquisition System
Dlgs.	Legislative Decree
HCD	Heating & Current Drive
ICT	Information and Communication Technology
M€	€ million
NRRP	National Recovery and Resilience Plan (Next generation EU funds)
PTFE	Progetto fattibilità tecnico economica – Technical Economical Feasibility Project
PY	Persons per Year
RUP	Responsabile Unico del Procedimento (Contract Holder as per Italian code of Public Contracts)
SIM	System Integration Management
THM	Tokamak Hall Management

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1. Introduction

This document describes the work-program of the DTT Consortium and defines the relevant budget for the year 2025.

The report is divided in 2 sections:

- The first section describes the so-called “construction costs” that include all the expenses for the procurement and installation of the goods needed for the completion of the DTT facilities.
- The second section provides an insight of the so-called “running costs” of the consortium that include the design activities and the operating costs needed for the functioning of the company.

The focus is on the 2025 plan, however, a complete list of construction contracts which award is forecasted during the 2025-2027 triennium is provided. This allows for a detailed examination of the progression of these cost commitments over the three-year period addressing the need to provide input data to the three-year plan, as required by Italian law for a public entity.

All the monetary value reported are in Euro and before VAT (where applicable).

2. Construction costs (Works and Supply of Goods)

The present section provides information relevant to the works and supply of good contracts for which activities are planned to be executed during the year 2025. The spending allocation has been defined in accordance with the planned receipt of the invoices from contractors and suppliers. For payments of pluriannual contract has been considered an anticipation of 20% in the first year (if the contract signature is planned within the 3rd quarter of the year) and the rest of contract value split on the remaining years.

The estimate-at-completion of the construction costs have already been developed in accordance with the contract award plan and will be submitted for approval by the board as soon as the new project baseline is approved.

The budget has been allocated in accordance with the project Work Break-down Structure and with the Product-Break-down Structure (PBS).

The following information is provided in attachment:

- List of all contracts to be awarded and signed in 2025 and their estimated value
- List of all contracts placed till 31 Dec 2023 and their actual value

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- List of all payments foreseen in 2025 for all contracts (already placed and to be placed in 2025)
- List of all contracts in three-years span (2025-2027)

It is important to note that the overall scope of construction is subdivided into two main categories:

- 1) Contracts covering the scope detailed in EPIC Annex 1
- 2) Contracts covering the scope detailed in EPIC Annex 2 (activities necessary for the handover of existing building and facilities from ENEA to DTT)

It is also noted that the scope can be also subdivided from the point of view of “Contracting Authority”

For historical reasons or other reasons associated to the origin of funding the following four cases are identified

- a) DTT (default contracting authority for Annex 1)
- b) DTT on behalf of ENEA (default contracting Authority for Annex 2)
- c) ENEA (contract directly placed by ENEA like contracts pre-existing the consortium, or associated to EU funding, all Annex 1)
- d) ENEA under PNRR (contracts funded under various funding scheme accessible to ENEA but not to DTT)

In the following the financial information is provided for the full scope of the investment but also subdivided

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The break-down of **new construction commitments** for each work-pack are provided in the following table:

Table 1- DTT Commitments in year 2025

Commitments in 2025	EPIC Annexes				
	ANNEX I		ANNEX I Totale	ANNEX II	Grand Total
WBS Level 1	DTT	ENEA		DTT for ENEA	
BOP	4.288.475 €		4.288.475 €	553.822 €	4.842.297 €
HCD	671.993 €		671.993 €		671.993 €
THM	173.103.280 €	81.654.260 €	254.757.540 €		254.757.540 €
Grand Total	178.063.748 €	81.654.260 €	259.718.008 €	553.822 €	260.271.830 €

Table 2- DTT Payments in year 2025

Payments 2025	EPIC Annexes					
	ANNEX I			ANNEX I Totale	ANNEX II	Grand Total
WBS	DTT	ENEA	ENEA PNRR		DTT for ENEA	
BOP	1.582.000 €			1.582.000 €	388.000 €	1.970.000 €
HCD	3.205.248 €		5.993.413 €	9.198.661 €		9.198.661 €
THM	26.889.082 €	3.973.800 €	15.474.917 €	46.337.799 €		46.337.799 €
Grand Total	31.676.330 €	3.973.800 €	21.468.330 €	57.118.460 €	388.000 €	57.506.460 €

The breakdown for each work-pack and level 2 WBS item is reported in the following sections including a narrative describing the scope of work ongoing, to be contracted in 2025 and to be prepared for contracting in year 2025.

To enhance the understanding of the document and the logical flow of activities, for each second level WBS, design costs and technical services provided by partners or outsourced (i.e., ANN) are also listed at the end of each section. These are the costs in 2025 necessary to prepare the technical documentation required to issue calls for tenders, to progress the design for the components that will be contracted in the following years and to follow-up the execution, test and acceptance of ongoing contracts

The breakdown of running costs, which includes design expenses and technical services, is then presented in a consolidated manner in the dedicated section.

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2.1 Work-package Tokamak Hall

In the following table is shown the summary information of construction costs for each WBS-2 level:

Commitments in 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA		
THM	173.103.280 €	81.654.260 €	254.757.540 €	254.757.540 €
MAG	128.338.980 €	0 €	128.338.980 €	128.338.980 €
ASS	19.000.000 €		19.000.000 €	19.000.000 €
DIA	0 €	23.020.260 €	23.020.260 €	23.020.260 €
IVC	149.300 €	12.634.000 €	12.783.300 €	12.783.300 €
OVC	25.615.000 €		25.615.000 €	25.615.000 €
PSS	0 €	46.000.000 €	46.000.000 €	46.000.000 €
RHS	0 €	0 €	0 €	0 €
Grand Total	173.103.280 €	81.654.260 €	254.757.540 €	254.757.540 €

Payments 2025	EPIC Annexes			
	ANNEX I			Grand Total
WBS	DTT	ENEA	ENEA PNRR	
THM	26.889.082 €	3.973.800 €	15.474.917 €	46.337.799 €
MAG	21.252.611 €	0 €		21.252.611 €
ASS	4.300.000 €			4.300.000 €
IVC	149.300 €	3.926.800 €		4.076.100 €
PSS	1.187.171 €	0 €	5.862.315 €	7.049.486 €
RHS	0 €	47.000 €	9.612.602 €	9.659.602 €
Grand Total	26.889.082 €	3.973.800 €	15.474.917 €	46.337.799 €

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2.1.1 Magnets (MAG)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA		
THM	173.103.280 €	81.654.260 €	254.757.540 €	254.757.540 €
MAG	128.338.980 €	0 €	128.338.980 €	128.338.980 €
CAS	18.055.027 €	0 €	18.055.027 €	18.055.027 €
Test in SULTAN for CAS components	2.049.577 €		2.049.577 €	2.049.577 €
Nb3Sn strands for the CS and PF conductors #2 - Lotto 1	15.694.000 €		15.694.000 €	15.694.000 €
Nb3Sn strands for the CS and PF conductors #2 - Lotto 2	288.950 €		288.950 €	288.950 €
portacampioni ITER barrel	22.500 €		22.500 €	22.500 €
CRY	50.000.000 €		50.000.000 €	50.000.000 €
Cryoplant	50.000.000 €		50.000.000 €	50.000.000 €
PFC	24.000.000 €		24.000.000 €	24.000.000 €
PF coils	24.000.000 €		24.000.000 €	24.000.000 €
TFC	36.143.953 €		36.143.953 €	36.143.953 €
TF casings #2	29.895.800 €		29.895.800 €	29.895.800 €
TF casings components and PF supports	5.000.000 €		5.000.000 €	5.000.000 €
TF Modules - Claim	1.247.374 €		1.247.374 €	1.247.374 €
mate. Elettronico	779 €		779 €	779 €
QDS	140.000 €		140.000 €	140.000 €
materiali per prototipi QDS	140.000 €		140.000 €	140.000 €

Payments 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
THM	21.252.611 €	21.252.611 €	21.252.611 €
MAG	21.252.611 €	21.252.611 €	21.252.611 €
CAS	7.313.473 €	7.313.473 €	7.313.473 €
SuperConducting_Cables	3.343.699 €	3.343.699 €	3.343.699 €
Test in SULTAN for CAS components	808.474 €	808.474 €	808.474 €

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Nb3Sn strands for the CS and PF conductors #2 - Lotto 1	3.138.800 €	3.138.800 €	3.138.800 €
portacampioni ITER barrel	22.500 €	22.500 €	22.500 €
PFC	4.800.000 €	4.800.000 €	4.800.000 €
PF coils	4.800.000 €	4.800.000 €	4.800.000 €
TFC	8.999.138 €	8.999.138 €	8.999.138 €
TF casings #2	1.487.316 €	1.487.316 €	1.487.316 €
TF Modules	6.263.669 €	6.263.669 €	6.263.669 €
TF Modules - Claim	1.247.374 €	1.247.374 €	1.247.374 €
mate. Elettronico	779 €	779 €	779 €
QDS	140.000 €	140.000 €	140.000 €
materiali per prototipi QDS	140.000 €	140.000 €	140.000 €
Grand Total	21.252.611 €	21.252.611 €	21.252.611 €

Below is a list of the main new contracts planned for 2025, along with a brief description of key information:

- Nb3Sn strands for the CS and PF conductors:** The original tender, awarded to Luvata, was unsuccessful, therefore the contract has been cancelled and a new tender has been launched in 2024. The contract for the procurement of copper wires has been signed on June the 10th, while that on the Nb3Sn strands has been signed on June the 20th. Only advance payment for 20% of the yearly contract milestones are expected. Specifically in the year 2025 no contract milestones are expected. To be noted that strand enough for the construction of time-critical cable for PF 6 has been secured by purchasing in 2024 residual ITER strand.
- Test in SULTAN for CAS components:** Contract for qualification of the cable in-conduit conductors at SULTAN facility at EPFL in Switzerland. ~~No payments are expected in 2025.~~ In 2025 the following tests shall be performed: i) TF production sample; ii) PF6 qualification sample (with F4E/ITER strands); iii) PF3 production sample; iv) CS qualification sample (with KAT strand), for an amount of 759.400,00 CHF corresponding to about 808 k€.
- TF casings components and PF supports:** the procurement of the TF casing #2 main scope has been awarded in 2024. The scope of supply has been subdivided with minor components of shorter supply times is going to be contracted in 2025 as a separate contract. The contracts activities are expected

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to start in the second half of 2025. The tender of the PF support shall be launched in fall 2025 and hardly a contract will be placed within the end of 2025. Only advance payment for 20% of the first contract is expected.

- **PF coils:** the call for tender has been launched in 2024.. The tender has not been awarded due to the excessive cost. A new tender using a negotiating procedure is under preparation. The award shall be announced by the end of 2025 but hardly advance payment for 20% of the contract can be expected.
- **Current Leads and Cold boxes:** since the 30 current leads needed to feed the superconducting magnet system must be tested before they assembly, due to the delays in the related magnets contracts the activity has been delayed also and the tender will be launched in 2026..
- **Cryoplant:** the procurement of the cryogenic system would take about 4 years from the start of the contract activities including the commissioning phase. The call for tender will be launched in 2025. The tender shall follow a negotiated procedure that may request 6 months to be completed, the contract will be hardly awarded and signed by the end of 2025.

The following, already contracted, activities are going to continue or be completed in 2025:

- **TF Modules:** the contract for the fabrication of the winding packs (WP) and subsequent integration in the casings, awarded by ASG, is proceeding. In first quarter 2025, the first complete WP is expected. Thanks to the availability of several other TF conductors already delivered to ASG, the fabrication of the remaining WP will proceed, and the second WP shall be completed by 2025.
- **Conductors:** production of the TF conductors (ICAS) continues after the 60 units lengths already delivered so far. Also, the production of the NbTi and Nb3SN conductors for the PF coils has started in 2024.

Moreover:

- **CS coils:** the additional experimental activities planned till first quarter 2025 will allow to get a final judgment on the CS coils winding layout. The call for tender shall be launched in the second half of 2025.
- **Feeders:** having completed the conceptual design of the feeders inside the cryostat, with the choice of the conductor performance, in 2025 engineering resources will be devoted to the preparation of the technical specification for the supply to be launched in 2026.

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Regarding **Services (MAG)** the total commitment for 2025 is 1.179M€ for the resources provided by DTT Shareholders and the ANN framework contract for follow-up of the supply contracts and to continue the design activities of the systems whose design has not yet been finalized.

Furthermore, in support of the engineering activities of the MAG WBS, it is expected that **additional internal resources** will be allocated corresponding to equivalent 4.3 PY (from the present allocation of 5.5 PY) at a cost for the consortium estimated in 316 k€ for 2025.

2.1.2 Vessel and Out-of-Vessel Components (OVC)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
THM	25.615.000 €	25.615.000 €	25.615.000 €
OVC	25.615.000 €	25.615.000 €	25.615.000 €
VVP	25.615.000 €	25.615.000 €	25.615.000 €
VVP Vacuum Vessel and Ports.	25.615.000 €	25.615.000 €	25.615.000 €
Grand Total	25.615.000 €	25.615.000 €	25.615.000 €

Below is a list of the main activities planned for 2025, along with a brief description of key information:

- **VVP Vacuum Vessel and Ports:** The call for tender has been relaunched and the contract is expected to be signed in the first quarter 2025. The filing of an appeal has slowed down the process. Only advance payment for 20% of the first year of contract milestone is expected equal to 203.9 k€.
- **CRS Cryostat Structure:** The cryostat (CRS) consists of the Cryostat Base (CBS) with seismic isolators, the Cryostat Cylindrical Body (CCB), and the Cryostat Top Lid (CTL). This call for tender will be launched at the end of 2025 and will secure the availability of first equipment and materials for the assembly operation as early as end of 2026. No payments foreseen in 2025
- **THS Thermal Shield:** The THS consists of the Vacuum Vessel Thermal Shield (VVTs), Ports Thermal Shield (PTS), Cryostat Thermal Shield (CTS). This tender follows that of the vacuum vessel with which shares the same delivery plan since the assembly foresees that each VV sector shall be covered by

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the proper thermal shield before insertion of the TF coils. The call for tender will be launched in mid-2025; no payments foreseen in 2025.

- **Cryogenic pumps:** the procurement of the cryogenic pumps need a relatively long period of qualification, followed by 18 months of manufacturing therefore, in order to have the pumps delivered by mid-2027, by the end of 2025 the relative call for tender shall be launched. No payments foreseen in 2025.

Moreover:

- **Pellet Injection system, Fueling Control System, Machine Cleaning (conditioning) System and In vessel coils not axial-symmetric:** the procurement is planned in 2025. The budget for PIS is not included in the present cost estimate and solutions have to be found including in-kind commitment through external collaborations (e.g. US)

Regarding **Services** (OVC) the total commitment for 2025 is 889 K€ for the resources provided by DTT **Shareholders and the ANN framework contract** for follow-up of the supply contracts and to continue the design activities of the systems whose design has not yet been finalized.

Furthermore, in support of the engineering activities of the OVC WBS, it is expected that **additional internal resources** will be allocated corresponding to equivalent 2.8 PY (from the present allocation of 3.5 PY) at a cost for the consortium estimated in 239 k€ for 2025.

2.1.3 Power_Supply_Systems (PSS)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes				
	ANNEX I			ANNEX I Totale	Grand Total
WBS	DTT	ENEA	ENEA PNRR		
THM	0 €	46.000.000 €	0 €	46.000.000 €	46.000.000 €
PSS	0 €	46.000.000 €	0 €	46.000.000 €	46.000.000 €
CSS	0 €	23.000.000 €		23.000.000 €	23.000.000 €
CS power supply		23.000.000 €		23.000.000 €	23.000.000 €
PFS	0 €	23.000.000 €		23.000.000 €	23.000.000 €
PF power supply		23.000.000 €		23.000.000 €	23.000.000 €
Grand Total	0 €	46.000.000 €	0 €	46.000.000 €	46.000.000 €

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Payments 2025	EPIC Annexes				
	ANNEX I			ANNEX I Totale	Grand Total
WBS	DTT	ENEA	ENEA PNRR		
THM	1.187.171 €	0 €	5.862.315 €	7.049.486 €	7.049.486 €
PSS	1.187.171 €	0 €	5.862.315 €	7.049.486 €	7.049.486 €
DIS			1.556.027 €	1.556.027 €	1.556.027 €
In-vessel coils power supply			1.556.027 €	1.556.027 €	1.556.027 €
NAS			2.160.048 €	2.160.048 €	2.160.048 €
In-vessel coils power supply			2.160.048 €	2.160.048 €	2.160.048 €
TFS	1.187.171 €			1.187.171 €	1.187.171 €
TF FDUs Fast Discharge Units (including Prototype for CTF)	905.020 €			905.020 €	905.020 €
TF Transformers and AC/DC Converters	282.151 €			282.151 €	282.151 €
VSS			2.146.240 €	2.146.240 €	2.146.240 €
In-vessel coils power supply			2.146.240 €	2.146.240 €	2.146.240 €
Grand Total	1.187.171 €	0 €	5.862.315 €	7.049.486 €	7.049.486 €

Below is a list of the main activities planned for 2025, along with a brief description of key information:

- **PF power supply:** with the launch of the call for tender for the PF coils also the call for tender of the related power supply (specifications ready) can start.
- **CS power supply:** with the launch of the call for tender for the CS coils also the call for tender of the related power supply can start.

The following, already contracted, activities are going to continue or be completed in 2025:

- **TF Transformers and AC/DC Converters:** The delivery of the converters shall be completed at the beginning of 2025.
- **TF FDUs Fast Discharge Units (including Prototype for CTF):** the delivery of the first FDU is expected in the second half of 2025.
- **In-vessel coils power supply:** the delivery of IVC power supply shall be completed in 2027.

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Regarding **Services** (PSS) the total commitment for 2025 is 286 K€ for the resources provided by DTT Shareholders and the ANN framework contract for follow-up of the supply contracts and to continue the design activities of the systems whose design has not yet been finalized.

The following preparatory activities are going to be performed in year 2025:

- Design and specs preparation for:
 - Dc Busbars
 - Other Ps Components (Dummy Loads)
 - Reactive power compensation system

Furthermore, in support of the engineering activities of the PSS WBS, it is expected that **additional internal resources** will be allocated corresponding to equivalent 3.5 PY (from the present allocation of 3 PY) at a cost for the consortium estimated in 246 k€ for 2025.

2.1.4 Diagnostics (DIA)

The scope of DIA WBS 2 is the design, integration and realization of DTT Diagnostic Equipment. As integration activities and interface issues are demanding on DTT, a diversified strategy for the PHASE1 and PHASE2 diagnostic equipment has been adopted. In particular, the planning of both design and implementation activities is conveniently differentiated. Indeed, the construction planning of diagnostics to be ready at beginning of Phase 1 (classified as “machine protection” or as “essential for operation”) must be strictly aligned to that of the machine assembly. This applies as well to the installation of diagnostic parts with an impact on the in-vessel components.

Other diagnostics for Phase 2, classified as for the “scientific program”, are anyhow expected to have a complete conceptual design before the start of Phase 1 (with specific attention to the solution of integration and interface issues).

The strategy presently envisaged foresees the realization of DTT diagnostic equipment by assigning the final design, procurement and realization to ENEA with the support and contribution of the other DTT shareholders.

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In 2024 the organization of WBS DIA level 4 has been reconsidered in order to have less interfaces, to concentrate competences, and to improve coordination within a same area. Therefore, 5 following main groups have been identified:

WBS-IV	Description
DMM-01	Magnetics measurements
DWL-02	Wall interaction measurements and divertor diagnostic
DTR-03	Scattering techniques and Radiation-Spectroscopic measurements
DIM-04	Interferometric and Microwave techniques
DNF-05	Neutrons, Gammas, Run-Aways and Fast Particles measurements

The table above includes, for each assignment, in general, diagnostics both for Phase 1 and Phase 2.

Commitments in 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA		
THM	0 €	23.020.260 €	23.020.260 €	23.020.260 €
DIA	0 €	23.020.260 €	23.020.260 €	23.020.260 €
Grand Total	0 €	23.020.260 €	23.020.260 €	23.020.260 €

According to the previous re-organizations 5 specific agreements of collaboration are under finalization with ENEA that will include: an estimation of the costs, schedule of activities and needed professional resources, up to the completion of the integrated commissioning. Also, the design activity for Phase 2 diagnostic equipment will be included in these agreements aimed at the completion of the conceptual design in order to meet the development of the overall integration activities.

No anticipation is expected, first **payment** is planned in 2026.

DTT will continue to provide central engineering support for the E-DRMs and machine integration. Specifically, the total commitment in the DIA WBS for 2025 is 27 K€ for the resources provided within the framework of DTT external **services** and ANN framework contract.

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Furthermore, in support of the engineering activities of the DIA WBS, it is expected that **additional internal resources** will be allocated corresponding to equivalent 1.75 PY (from the present allocation of 3.5 PY) at a cost for the consortium estimated in 130 k€ for 2025.

2.1.5 Assembly (ASS)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
THM	19.000.000 €	19.000.000 €	19.000.000 €
ASS	19.000.000 €	19.000.000 €	19.000.000 €
ATH	19.000.000 €	19.000.000 €	19.000.000 €
DTT assembly contract	19.000.000 €	19.000.000 €	19.000.000 €
Grand Total	19.000.000 €	19.000.000 €	19.000.000 €

Payments 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
THM	4.300.000 €	4.300.000 €	4.300.000 €
ASS	4.300.000 €	4.300.000 €	4.300.000 €
ATH	4.300.000 €	4.300.000 €	4.300.000 €
DTT assembly contract	4.300.000 €	4.300.000 €	4.300.000 €
Grand Total	4.300.000 €	4.300.000 €	4.300.000 €

DTT Assembly Contract: In 2024, the technical specifications for the DTT assembly contract has been completed. In the first quarter of 2025 it is expected to launch the relative call for tender that will be characterized by three contract stages in preparation of the assembly:

- the engineering for the assembly procedure will be carried out
- the tooling for the pre-assembly and assembly phase will be procured
- the qualification activities to be carried out in an existing building in preparation of the assembly shall start. Afterwards, the assembly will start in the torus hall building.

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The contract for the assembly will include:

- Procurement and installation of the FW/DIV and VV Water coolant system including pipes, bellows, support structure, valves and instrumentation
- Engineering design, manufacturing and procurement of all the tools and frames to support the assembly of all the components inside the torus all (building 185)
- Qualification activities to be carried out, in an existing building, and assembly of all tokamak machine.

Only advance **payment** of the contract is expected in 2025.

Note: EUROFUSION will financially support the assembly contract from the beginning with the support of the engineering phase and the procurement of the tools and frame for the assembly.

Regarding **Services** (ASS) the total commitment for 2025 is 406 K€ for the resources provided by DTT Shareholders and the ANN framework contract for follow-up of the supply contract and to continue the support in the design and integration activities not yet finalized.

Furthermore, in support of the engineering activities of the ASS WBS, it is expected that **additional internal resources** will be allocated corresponding to equivalent 1.5 PY (from the present allocation of 3 PY) at a cost for the consortium estimated in 104 k€ for 2025.

2.1.6 Remote Handling Systems (RHS)

In the following table is shown the summary information of construction costs for each WBS-3 level:

No new **commitments** are expected in 2025.

Payments 2025	EPIC Annexes				
	ANNEX I			ANNEX I Totale	Grand Total
WBS	DTT	ENEA	ENEA PNRR		
THM	0 €	47.000 €	9.612.602 €	9.659.602 €	9.659.602 €
RHS	0 €	47.000 €	9.612.602 €	9.659.602 €	9.659.602 €
RHB	0 €		4.255.552 €	4.255.552 €	4.255.552 €
RH Boom (WP3 PNRR)			4.255.552 €	4.255.552 €	4.255.552 €
RHD	0 €	47.000 €	3.916.793 €	3.963.793 €	3.963.793 €
CMM (ENEA extra EPIC)		47.000 €		47.000 €	47.000 €
CMM (WP3 PNRR)			3.916.793 €	3.916.793 €	3.916.793 €

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RHF	0 €		1.440.257 €	1.440.257 €	1.440.257 €
WP3 Mockups DTT RHR			1.440.257 €	1.440.257 €	1.440.257 €
Grand Total	0 €	47.000 €	9.612.602 €	9.659.602 €	9.659.602 €

Regarding **Services** (RHS) the total commitment for 2025 is 526 K€ for the resources provided by DTT Shareholders and the ANN framework contract for follow-up of the supply contracts and to continue the design activities of the systems whose design has not yet been finalized.

Engineering activities will be devoted to finalizing the design of end-effector tooling and in particular the cut- and welding tools that shall be used in the assembly process. In this regard, the resources already allocated for PhD students will provide useful information for the subsequent engineering activities, for the set-up of the RH procedures and the compatibility analyses of the in-vessel components with the RH tools.

Furthermore, in support of the engineering activities of the RHS WBS, it is expected that additional **internal resources** will be allocated corresponding to equivalent 1 PY (from the present allocation of 1.5 PY) at a cost for the consortium estimated in 71 k€ for 2025.

2.1.7 Divertor and In Vessel Components (IVC)

During 2024 the procurement activities for divertor and first wall have been delayed due to technical reasons. In particular, the divertor design has been delayed by the optimization of the poloidal profile and toroidal shaping. The finalization of the poloidal and toroidal shapes has been completed in 2024 giving the possibility to finalize also the engineering design of the cassette structures and of the PFUs and the correct definition of the monoblocks that constitutes the PFUs. Divertor prototyping can now start.

Regarding the FW, its design has been affected by the analysis of the thermal load local concentration and runaway electrons impact. This has affected the typology, segmentation and shaping of some FW panels. FW prototyping has started in 2024 allowing to start also the design verification using mock-ups to be tested in specific testing facilities.

Regarding the divertor, it is noted that all costs of engineering, prototyping, and fabrication are directly contracted by ENEA and paid activities as an in-kind Shareholder contribution. The only contribution of DTT S.c.ar.l is limited to engineering services included in the ANN framework contract and the DTT internal resources.

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For homogeneity in reporting, the planned costs for Construction and Services in year 2025 are reported hereinafter.

Commitments in 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA		
THM	149.300 €	12.634.000 €	12.783.300 €	12.783.300 €
IVC	149.300 €	12.634.000 €	12.783.300 €	12.783.300 €
DIV		12.634.000 €	12.634.000 €	12.634.000 €
Divertor cassette		5.800.000 €	5.800.000 €	5.800.000 €
Divertor materials (mono-blocks tungsten)		6.000.000 €	6.000.000 €	6.000.000 €
Divertor Prototype		834.000 €	834.000 €	834.000 €
FWA	149.300 €		149.300 €	149.300 €
campioni per limiter	9.800 €		9.800 €	9.800 €
campioni limiter	139.500 €		139.500 €	139.500 €
Grand Total	149.300 €	12.634.000 €	12.783.300 €	12.783.300 €

Payments 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA		
THM	149.300 €	3.926.800 €	4.076.100 €	4.076.100 €
IVC	149.300 €	3.926.800 €	4.076.100 €	4.076.100 €
DIV		3.926.800 €	3.926.800 €	3.926.800 €
Divertor cassette		1.160.000 €	1.160.000 €	1.160.000 €
Divertor materials (mono-blocks tungsten)		2.600.000 €	2.600.000 €	2.600.000 €
Divertor Prototype		166.800 €	166.800 €	166.800 €
FWA	149.300 €		149.300 €	149.300 €
campioni per limiter	9.800 €		9.800 €	9.800 €
campioni limiter	139.500 €		139.500 €	139.500 €
Grand Total	149.300 €	3.926.800 €	4.076.100 €	4.076.100 €

Below is a list of the main activities planned for 2025, along with a brief description of key information:

- **Procurement of the Tungsten Monoblock armor**
- **Procurement of the Divertor Cassette**

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- **Fabrication of DTT divertor prototypes**, namely the PFCs prototypes (inner and outer vertical target and dome)
- **Fabrication of the FW prototypes**, namely the FW limiter and standard modules, the top first wall and one panel of the outer first wall.
- **In-vessel components Mock-Up's fabrication.**

The FW activities are carried out within the DTT Shareholder **services** plan and the total allocation for 2025 is 354 K€ in this framework.

In addition, equivalent 1 PY are allocated in **DTT internal resources** in 2025 (from the present allocation of 4 PY) at a cost for the consortium estimated in 57 k€ for 2025.

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2.2 Work-package Heating and Current Drive

In the following table is shown the summary information of construction costs for each WBS-2 level:

Commitments in 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA PNRR		
HCD	671.993 €	0 €	671.993 €	671.993 €
ECH	556.993 €	0 €	556.993 €	556.993 €
ICH	115.000 €	0 €	115.000 €	115.000 €
Grand Total	671.993 €	0 €	671.993 €	671.993 €

Payments 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total
WBS	DTT	ENEA PNRR		
HCD	3.205.248 €	5.993.413 €	9.198.661 €	9.198.661 €
ECH	2.428.748 €	0 €	2.428.748 €	2.428.748 €
ICH	776.500 €	5.993.413 €	6.769.913 €	6.769.913 €
Grand Total	3.205.248 €	5.993.413 €	9.198.661 €	9.198.661 €

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2.2.1 Electron Cyclotron Heating (ECH)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
HCD	556.993 €	556.993 €	556.993 €
ECH	556.993 €	556.993 €	556.993 €
ECS	150.000 €	150.000 €	150.000 €
ECH Control System	150.000 €	150.000 €	150.000 €
ERS	321.993 €	321.993 €	321.993 €
Insurance and capital protection for ERS components	159.472 €	159.472 €	159.472 €
Test in FALCON for ERS components	139.000 €	139.000 €	139.000 €
Guarnizioni Helicoflex	15.089 €	15.089 €	15.089 €
Flange collegamento RF Load-Gyrotron	8.432 €	8.432 €	8.432 €
ETV	85.000 €	85.000 €	85.000 €
Multibeam mirror	50.000 €	50.000 €	50.000 €
Polarizer mirror	35.000 €	35.000 €	35.000 €
Grand Total	556.993 €	556.993 €	556.993 €

Payments 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
HCD	2.428.748 €	2.428.748 €	2.428.748 €
ECH	2.428.748 €	2.428.748 €	2.428.748 €
ECS	150.000 €	150.000 €	150.000 €
ECH Control System	150.000 €	150.000 €	150.000 €
ERS	2.193.748 €	2.193.748 €	2.193.748 €
Gyrotrons (pre-series)	1.594.650 €	1.594.650 €	1.594.650 €
RF Load	506.077 €	506.077 €	506.077 €
Test in FALCON for ERS components	69.500 €	69.500 €	69.500 €
Guarnizioni Helicoflex	15.089 €	15.089 €	15.089 €
Flange collegamento RF Load-Gyrotron	8.432 €	8.432 €	8.432 €
ETV	85.000 €	85.000 €	85.000 €
Multibeam mirror	50.000 €	50.000 €	50.000 €
Polarizer mirror	35.000 €	35.000 €	35.000 €
Grand Total	2.428.748 €	2.428.748 €	2.428.748 €

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Below is a list of the main activities planned for 2025, along with a brief description of key information:

- **HVPS for gyrotron:** Technical Specification are under the final revision. The S-DRM will be held before the end of 2025 in order to launch the tender before the end of the year, while the signature of the contract in Q2 of 2026. In the tender part of the AUX (the gyrotron filament power supply) will be included and considering the increase of the cost of raw material and services a commitment of 23.000.000 has to be considered, instead of the previous 21.000.000.
- A contract is under signature with EPFL to perform the SAT of the first two RF loads and the test of prototype mirrors of the Transmission Line, including also the connection line manufactured.
- The completion of the HW for the control system of the first gyrotron will be done in 2025, after a first part of it has been procured under PNRR in 2024.
- A contract signed to procure the Helicoflex seals to connect the connection line prototype to the RF Load and the Gyrotron
- A contract will be signed to procure the flange adapter to connect the RF Load to the connection line prototype
- **Insurance and capital protection:** to be issued, from a general framework contract, once the ownership of gyrotron pre-series will be formally transferred to DTT.

The following, already contracted, activities are going to continue or be completed in 2025:

- **GYROTRON:** after an issue in the cavity cooling, discovered in 2024, THALES has repaired the tube with more stringent procedure in the manufacturing of the cavity cooling system. The tube has been re-assembled in Vélizy and will be shipped to FALCON for the new commissioning and the final FAT expected to be held in November 2025, then the ownership formally transferred to DTT. The pre-series gyrotron will be left at FALCON and used (by DTT, SPC and F4E) to test high power components for DTT and ITER US (a trilateral agreement will be signed after the contract with EPFL for the exploiting of FALCON facility). The contract for 15 series gyrotrons has been signed in December 2023.. Due to delay in preparing the THALES facility KGP5 and the delays due to the issues found on the pre-series Gyrotron, THALES has required a change in the schedule that shift the delivery of the first two series gyrotron in Q4 2026, which amendment is under finalization. This modification has

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no impact on the general schedule of DTT first plasma. For this reason no payment are foreseen 2025 related to this contract.

- **RF Load:** contract signed in 2024. FAT of the first unit completed successfully, SAT in 2025 at FALCON using the pre-series gyrotron (if available) or the prototype (owned by F4E). FAT of the second unit are foreseen in September 2025, while SAT in November 2025.
- **Control System:** completion of the HW procured under NRRP (Next Generation EU) for the ECH Test Bed to be used as a control system for the first gyrotron. The system will be used to develop software for the Test Bed ECH (in case of realization) or for the first gyrotron installed in DTT and to develop the final system characteristics.

Services 2025 ECH: total commitment 0. 968 M€, key activities are listed here below:

- **Transmission Line:** activities under contract L4-ANN to be completed in 2025, then the engineering phase will be started finalized to the preparation of the Technical Specification for the tender. A prototype of the multibeam mirror and of the polarizer will be done to assess the manufacturing feasibility with 3D printing.
- **Launcher:** activities under contract L4-ANN to be completed in 2025. The C-DRM will be held at the end of 2025, after further studies on mirrors materials and cooling and driving system. This is due to the results on the expected electromagnetic loads performed under the L4 contract. A modification on the launcher structure and layout is needed due to the high forced induced by major disruption on it. A decision will be taken on the construction of prototypes for the two driving systems and for the final design of mirrors, that could be tested on FALCON in 2026 using the pre-serie gyrotron.
- **RF sources:** Follow up activity on gyrotrons and RF load contracts. The hardware for the bolometric system of the RF Load has been identified and the software developed. Technical specification for the bolometric system will be developed in 2025.
- **Control system:** In 2025 C-DRM for the ECH Plant Control System (ECS) has to be done. Technical Specification for ECS will be developed.
- **Power supplies:** The documentation of the tender for the HVPS will be completed and the tender launched.

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Test Bed ECH: a strong need and interest to set-up an ECH Test Bed facility on-site has been verified for DTT and for the ECH European community. A report on Cost & benefit has been done and preliminary circulated and is waiting for ENEA comments. After the decision by ENEA and DTT, a final proposal will be submitted for approval.

2.2.2 Ion Cyclotron Heating (ICH)

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes		
	ANNEX I	ANNEX I Totale	Grand Total
WBS	DTT		
HCD	115.000 €	115.000 €	115.000 €
ICH	115.000 €	115.000 €	115.000 €
CPS	50.000 €	50.000 €	50.000 €
Fornitura di PLC, periferiche I/O, HotRIO, ADC, schede I/O, computer per fast controller e licenze FPGA	50.000 €	50.000 €	50.000 €
IDG	45.000 €	45.000 €	45.000 €
Fornitura di strumentazione elettronica e componenti per sistemi di rivelazione e misure	45.000 €	45.000 €	45.000 €
VFT	20.000 €	20.000 €	20.000 €
Prototipo di feedthrough ICH	20.000 €	20.000 €	20.000 €
Grand Total	115.000 €	115.000 €	115.000 €

Procurement of components for testing the Transmitter will be done with simple orders as the first prototype of the vacuum Feedthrough.

Payments 2025	EPIC Annexes			
	ANNEX I		ANNEX I Totale	Grand Total

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WBS	DTT	ENEA PNRR		
HCD	776.500 €	5.993.413 €	6.769.913 €	6.769.913 €
ICH	776.500 €	5.993.413 €	6.769.913 €	6.769.913 €
CPS	50.000 €		50.000 €	50.000 €
Fornitura di PLC, periferiche I/O, HotRIO, ADC, schede I/O, computer per fast controller e licenze FPGA	50.000 €		50.000 €	50.000 €
IDG	45.000 €		45.000 €	45.000 €
Fornitura di strumentazione elettronica e componenti per sistemi di rivelazione e misure	45.000 €		45.000 €	45.000 €
TLM	661.500 €	946.418 €	1.607.918 €	1.607.918 €
ICH Transmission line & matching	661.500 €		661.500 €	661.500 €
ICH Transmission line & matching - Test Bed ICH		946.418 €	946.418 €	946.418 €
TXI	0 €	5.046.995 €	5.046.995 €	5.046.995 €
ICH-Transmitter (PNRR)	0 €	5.046.995 €	5.046.995 €	5.046.995 €
VFT	20.000 €		20.000 €	20.000 €
Prototipo di feedthrough ICH	20.000 €		20.000 €	20.000 €
Grand Total	776.500 €	5.993.413 €	6.769.913 €	6.769.913 €

The following, already contracted, activities are going to continue or be completed in 2025:

- ICH Transmission line & matching (NRRP funded)
- ICH-Transmitter (NRRP funded)

Services 2025 ICH: total new commitment in 2025: 600 k€

- Solid State Transmitter: Follow-up of transmitter contract.
- Transmission Line. Final assessment of the conceptual design (C-DRM) and follow up of the procurement of the first batch of components (under NRRP).
- Feedthrough: Selection of baseline solution and start of prototype design and procurement.
- Antenna: the antenna type has been selected (3-strap), in 2025 the activity will be focused on assembly procedure and technical choices for remote-handling solution, faraday screen and limiter (materials and cooling), electromagnetic load will be included in the L5 contract with ANN.

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- Control System: definition functional requirement and start of the conceptual design. Engineering design, specification and procurement for hardware and software for the part of the system needed to test the Transmitter.
- ICH Diagnostics: inter-machine survey of ICRH diagnostics / definition of diagnostics for DTT / preliminary design of arc detection systems / technical support to antenna task for integration/ development of front-end electronics for RF power measurements.
- Auxiliary Units and Structures: definition of the complete layout of the Test Bed and of the whole ICH system, specification and procurement of auxiliary components for NRRP ICRH testbed.

2.2.3 Neutral Beam Injectors (NBI)

In 2025 the R&D activities will be limited to complete prototype activities on accelerating grids and to maintain the interfaces control. Residual activity will be dedicated to study a possible layout of the MMC power supplies on DTT site. Total commitment in 2025 is of 102 k€. The main activity will be the completion of the conceptual design of the accelerator, especially on the 3D printing as producing technics for the accelerating grids. The activities on the magnetic screening of the injector will be continued.

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2.3 Work-package Balance of Plant

In the following table is shown the summary information of construction costs for each WBS-2 level:

Commitments in 2025	EPIC Annexes		
	ANNEX I	ANNEX II	Grand Total
WBS	DTT	DTT for ENEA	
BOP	4.288.475 €	553.822 €	4.842.297 €
AUX	1.000.000 €		1.000.000 €
BUI	3.288.475 €		3.288.475 €
ENA		553.822 €	553.822 €
Grand Total	4.288.475 €	553.822 €	4.842.297 €

Payments 2025	EPIC Annexes			
	ANNEX I	ANNEX I Totale	ANNEX II	Grand Total
WBS	DTT		DTT for ENEA	
BOP	1.582.000 €	1.582.000 €	388.000 €	1.970.000 €
AUX	320.000 €	320.000 €		320.000 €
BUI	1.262.000 €	1.262.000 €		1.262.000 €
ENA			388.000 €	388.000 €
Grand Total	1.582.000 €	1.582.000 €	388.000 €	1.970.000 €

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2.3.1 WBS AUX-Auxiliary Plan Systems

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes	
	ANNEX I	Grand Total
WBS	DTT	
BOP	1.000.000 €	1.000.000 €
AUX	1.000.000 €	1.000.000 €
EDT	1.000.000 €	1.000.000 €
Building 89 for ICH	1.000.000 €	1.000.000 €

Payments 2025	EPIC Annexes	
	ANNEX I	Grand Total
WBS	DTT	
BOP	320.000 €	320.000 €
AUX	320.000 €	320.000 €
EDT	320.000 €	320.000 €
Building 89 for ICH	320.000 €	320.000 €

The commitments foreseen are for the following contracts associated to construction works on site:

- Contract for the preparation of the technical specification for electrical system for Building 89 - preparatory activities for ICH Transmitter installation.
- Works for Building 89 for ICH refurbishment and preparation for the ICRH Cooling System
- PFTE of the water cooling and other auxiliaries' systems, postponed to 2026. The preparation of the design guideline document (DIP) is currently underway, with the invitation to tender planned for Sept 2025.

Services (total new commitment and payment in 2025 78 K€):

- Shareholders support is estimated in 78 k€

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- Internal coordination is estimated in 13k€

Note: external engineering services payments are included construction works

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2.3.2 WBS BUI-Building and Services

In the following table is shown the summary information of construction costs for each WBS-3 level:

Commitments in 2025	EPIC Annexes	
	ANNEX I	Grand Total
WBS	DTT	
BOP	3.288.475 €	3.288.475 €
BUI	3.288.475 €	3.288.475 €
OCW	3.288.475 €	3.288.475 €
Construction site Gate (Site preparation)	267.000 €	267.000 €
Deconstruction Building 73 and tunnel	2.061.911 €	2.061.911 €
Demolitions Building 90 and ditch area	652.000 €	652.000 €
Insurance and capital protection for OCW works	10.564 €	10.564 €
Repository for excavation materials - Engineering and site studies + Verification of Executive Design	205.000 €	205.000 €
Repository for excavation materials - Work Directions , Acceptance tests & Safety Law36/23	92.000 €	92.000 €

Payments 2025	EPIC Annexes	
	ANNEX I	Grand Total
WBS	DTT	
BOP	1.262.000 €	1.262.000 €
BUI	1.262.000 €	1.262.000 €
OCW	1.262.000 €	1.262.000 €
Construction site Gate (Site preparation)	100.000 €	100.000 €
Deconstruction Building 73 and tunnel	410.000 €	410.000 €

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Demolitions Building 90 and ditch area	652.000 €	652.000 €
Repository for excavation materials - Engineering and site studies + Verification of Executive Design	100.000 €	100.000 €

The new buildings works are planned to be contracted in Q1 of 2026. Formal actions of transfer of ownership to DTT Scarl of the construction area and associated service areas is planned to be completed and formalized by Q3 of 2025.

Here following the status of the preparatory engineering activities to launch the above tenders is reported:

- Tokamak Hall and New Buildings: the updated “PTFE : Progetto fattibilità tecnico economica” post-value engineering has been completed in December 2023. The third-party project verification has been performed and completed in September 2024. The necessary documents to launch the tender (Contract scheme, Tender specifications and relevant invitation to tender, were prepared for publication in December 2025. However, they required revision due to a corrective legislative update to the Public Procurement Code. Consequently, the Invitation to Tender was issued in May 2025 and the award date is expected by beginning of 2026.
- Construction of Site Gates (Site Preparation): The engineering design was assigned and was completed in Dec. 24. The project verification has been contracted and was completed in June 2025. The invitation to tender is expected to be issued by June 2025, and the construction activities are planned to be completed by Q1 2026.
- Deconstruction of the buildings 73: The engineering design was completed in Sept 2024. The project verification started in Feb 2025 and is expected to be completed by June 2025. Deconstruction works are planned to start in Q4 2025 to be completed by Q2 2026.
- Demolition of building 90 The engineering design was completed in July 2024 and fully verified. Invitation to tender was issued in March 2025 and the contract signature is expected by July 2025. Demolition works are planned to start within Sept 2025 to be completed within Dec 2025.
- Purchase request for the design, work direction and safety for the repository for excavation materials was issued in April 2025, Preliminary market consultation for invitation to tender is expected in June 2025.

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Services (BUI) (total new commitment in 2025: 98 k€, total payments in 2025: 98 k€)

- External services payments are on construction works 30 K€ for the follow up of THB tender by Shareholders
- 10 k€ for revision of RFB Design Guidance Document (DIP); Further shareholders support is estimated in 38 k€ for review of Constructability report integrated with AUX project
- 20 k€ for travel expenses

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2.3.3 WBS ENS-Electrical Network System

No new **commitments** in 2025.

No **payments** in 2025.

The “Progetto fattibilità tecnico economica” merging the scopes of HVS (extra EPIC) assigned to DTT by ENEA (estimated cost 19.8 M€) and EDS (included in EPIC) estimated cost 31.2 M€, is has been completed and it is under verification (verification expected to be completed by June 2025). Accordingly, the procurement activities for the HVS and EDS are expected to be launched in the Q3 2025, with the objective to place the contract at the beginning of 2026. Therefore, no construction spending is planned in 2025.

Services (total new commitment in 2025: 104 k€, total payments in 2025: 104 k€):

- 39 K€ for the follow up of THB tender by Shareholders or external professional
- Shareholders support is estimated in 65k€, for review of Constructability report integrated with ENS project
Internal coordination is estimated in 71k€

2.3.4 WBS AUT-Control, Safety, Security and Telecommunication Systems

No new **commitments** in 2025.

No **payments** in 2025.

Services (total new commitment in 2025: 0 k€, total payments in 2025: 0 k€):

- Internal coordination is estimated in 33k€

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2.3.5 ENEA's Activities assigned to DTT

The consortium is carrying out some preliminary activities assigned by ENEA. The forecasted spending for 2025 is reported in the following table.

Commitments in 2025	EPIC Annexes	
	ANNEX II	Grand Total
WBS	DTT for ENEA	
BOP	553.822 €	553.822 €
ENA	553.822 €	553.822 €
F23	140.000 €	140.000 €
F23 refurbishment	140.000 €	140.000 €
IFN	200.000 €	200.000 €
MV connection to INFN (prot. ISER_17445)	200.000 €	200.000 €
RFB	213.822 €	213.822 €
Cutting doors building 85 Engineering and third party verifications	43.000 €	43.000 €
Cutting doors Buildings 85 (prot.FSN_43980) Work Directions , Acceptance tests & Safety Law36/23	25.822 €	25.822 €
Other Engineering and third party verifications	145.000 €	145.000 €
Grand Total	553.822 €	553.822 €

Payments 2025	EPIC Annexes	
	ANNEX II	Grand Total
WBS	DTT for ENEA	
BOP	388.000 €	388.000 €
ENA	388.000 €	388.000 €
F23	140.000 €	140.000 €
F23 refurbishment	140.000 €	140.000 €
IFN	60.000 €	60.000 €

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MV connection to INFN (prot. ISER_17445)	60.000 €	60.000 €
RFB	188.000 €	188.000 €
Cutting doors building 85 Engineering and third party verifications	43.000 €	43.000 €
Other Engineering and third party verifications	145.000 €	145.000 €
Grand Total	388.000 €	388.000 €

Further to the activity included in the appendix 2 of the EPIC new activities are now under DTT responsibility:

- F23 Refurbishment
- MV connection to INFN Enel substation: this activity needs close coordination with the EDS and HVS projects
- Revamping of ENEA electrical distribution system: only design is under DTT responsibility

The details of the agreement between ENEA and DTT are reported in following formal letters:

- ENEA/2022/ 17445 /ISER
- ENEA/2023/46032/FSN
- ENEA/2023/82269/FSN

The scope of work, that DTT is requested to perform on request of ENEA, is partially formalized in the agreement between ENEA and DTT *“Primo accordo per attività relative alla preparazione del sito e all’adeguamento dei fabbricati esistenti, oltre alle attività extra budget propedeutiche alla costruzione”* signed on 28 June 2024 (DTT/2024/906/PROTGEN).

Refurbishment of F23 is planned to be performed in 2025, it will be included in the tender for demolition of building 90. Works are planned to start within Sept 2025 to be completed within Dec 2025.

Regarding the project for the new connection of the ENA center to the MV, the plan is to start by Q4 2025.

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The design of the ENEA center electrical distribution revamping project is postponed to 2026

These activities are financed 100% by ENEA and put on a specific budget order in the DTT budget.

Regarding the RFB project, the plan is to assign the Vulnerability Assessment of the existing building within this year.

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3 Consortium Running Costs

The running costs of the consortium are borne by the partners as per their share in the consortium. The total running costs have been estimated in 130 M€ and the detailed breakdown and phasing, including the previous years actual costs, will be included in the full life plan of the project.

The running cost have been divided into 4 groups:

- Costs for DTT personnel and assigned personnel by the shareholders
- Costs for technical services to be supplied through shareholders agreement and external contracts
- Costs for external Facilities utilization and R&D (moved to construction costs)
- Operating Costs

In the following sections a detailed description of each cost item is provided.

3.1 Costs for DTT personnel and assigned personnel by the shareholders

In this item the cost of the personnel working for the consortium is included, namely:

- Personnel by ShareholdersDirect hired personnel (including fixed-terms consultancy contracts).

In the following table a summary of personnel foreseen in 2025 for the consortium and the relevant estimated costs are shown.

DTT Personnel - Internal PY	Personnel already available	New Personnel in 2025	Total PY	Estimated cost (K€)
Personnel by Shareholders	35,5	4,5	40,0	3.165,00
DTT Direct Hired Personnel	15,0	17,0	32,0	2.080,00
Total	50,5	21,5	72,0	5.245,00

The total number of person-years indicated for 2025 is to be understood as equivalent. The individuals made available from shareholders are, in most cases, part-time. The staff to be hired in 2025 (total headcount 80) has been calculated by considering the 21 positions that remained vacant in the recruitment process

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published during 2023 (staffing plan 2023-2025) and the new 59 positions outlined in the staffing plan 2025-2027 currently in preparation. For the new positions (estimated at 59), it is anticipated to take place in December, once the entire approval process of the plan, publication of the announcement, and candidate evaluation have been completed.

In order to estimate the cost of the internal personnel an average cost of 80 K€/PY has been used for both secondees and available personnel from shareholders and 65 K€/PY DTT direct hired personnel including personnel with consulting contracts. Such average cost, based on the actual costs from previous years, is a good approximation for the purpose of budget definition.

3.2 Costs for technical services to be supplied through shareholders agreement and external contracts

This item includes all the technical services provided by the shareholders, the framework contract with Ansaldo Nucleare and other external contracts.

The following table shows the 2025 budget values for Technical Services for each specific area. It is important to note that the budget for physics activities is now included in the overall budget.

Technical Services	Shareholders services (K€)	ANN Framework Contract (K€)	Other Engineering Contracts (K€)	Total Technical Services (K€)
Physics	385,00			385,00
Management	1.733,00		497,00	2.230,00
THM	2.902,00	765,00		3.667,00
HCD	1.422,00	248,00		1670,00
BOP	280,00			280,00
Total	6.722,00	1.013,00	497,00	8.232,00

In the attachment “Technical Services”, the budget details for each individual project included in the Work Breakdown Structure (WBS) are provided. The planning for 2025 has been developed by the work-package managers and their WBS coordinators based on the progress status of activities at the end of 2024 and the construction plan presented in the previous chapter. Shareholders services include both personnel and their missions, as well as any hardware purchases and industry contracts.

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Once the present WP&B is approved and the aforementioned project plans are finalized, the project leaders, as per procedure, will develop the proposals for each project in line with the approved budget. The individual contribution of each shareholders will then be included in the revision of the WP&B2025 as soon as all proposals are completed and approved according to the calls procedure.

3.3 Costs for External Facilities utilization and R&D

Following the principle of added value of components, the costs for tests and mock-up's were moved to construction scope. Namely:

- use of the ENEA Frascati Coil Cold Test Facility (FCCTF)
- Remote Handling Facility is not part of the scope of construction. ENEA takes care of its construction (financed through the PNRR grant).
- qualification of the cable in-conduit conductors at SULTAN facility at EPFL in Switzerland.
- In-vessel components Mock-Up's fabrication.

3.4 Operating costs

This item includes the cost for the corporate bodies, management (Data Protection Officer, legal assistance, insurances, incentives to the personnel, and various small contracts), ICT, missions for the supervision of tasks and contracts by DTT personnel only, participation to conferences and other institutional events.

In the following table the 2025 budget for above mentioned activities is shown while in the continuation of the chapter a brief description of main items is reported.

Note that for completeness, the costs for DTT direct Hired personnel (1) and External Technical Services (2) have been included in the table because they are costs directly paid by DTT (not provided in-kind by Shareholders), but they have been described and included in the previous paragraphs: (1) already included in DTT Personnel costs and (2) already included in DTT Technical Services costs.

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Consortium Operating Costs	WP&B2025
President	3.452,50
ACC_Administration Company Costs	815,00
EXP_Expositions	100,00
HRO_Human Resources Outsourcing	2.080,00
PHD_Borse di Studio e Dottorato	350,00
COU_Training and Updating Courses	67,50
INC_Incentives	40,00
Chief Financial Officer	302,50
CIN_Internal Consultancy (Legal, Administrative, etc.)	187,50
INS_Insurance	50,00
TAX_Tax Affairs	65,00
Management	2.250,00
MIS_Missions	75,00
EXS_External Technical Services	1.510,00
PER_Permitting	50,00
CLI_Internal Legal Consultancy (DPO, 231)	20,00
CLE_External Legal Consultancy	70,00
TEN_Tender Notices	50,00
ICT_Information Communications & Technology	450,00
System Integration	355,00
CCM_Configuration Control Models Management	232,00
DTA_Design and tenders assessments	53,00
CHS_Codas Hardware and Software licences	70,00
THM_Tokamak Hall Management R&D	-
MFT_Magnets Factory Tests	-
IMU_In-vessel components Mock-Up's	-
Total Consortium Operating Costs	6.335,00

- ACC - Administration and Company costs include Corporate Bodies (in line with 2024) and Logistic and renting services (expected an increase vs 2024 due to transfer of existing ENEA areas and buildings to DTT)
- EXP - Expositions (in line 2024 budget)
- HRO - Human resources outsourcing (see previous paragraphs)
- PHD – “Borse di studio e dottorato “, PhD Grants (no new PhD, payments of previous assigned ones)

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- COU - Training and updating courses (increased for new resources)
- INC - Incentives (estimated for follow up of start of THB contract)
- CIN - Internal consultancy (in line with 2024)
- INS - Insurances (in line with 2024, excluding components insurances and capital protection services added to construction scope)
- MIS - Missions (in line with 2024 budget)
- EXS - External technical services (see *3.2 Technical services to be supplied through shareholders agreement and external contracts*)
- PER -Permitting (including archaeological supervision during works and technical office contracts for maintenance of ENEA existing buildings transferred)
- CLI -Internal and external legal consultancy (in line with 2024 budget)
- TEN - Tender notices (increased for more tenders expected)
- ICT Information Communications & Technology (including Framework agreement for Alfresco maintenance, 231 compliance, HW/SW Purchase, HW for MEPA network infrastructure, Office 365 licenses and configuration, Primavera SW licenses, HW and services, in line with 2024 budget)
- CCM - Configuration control models management (3D experience licenses). It is planned to be move to construction scope as 20% of incentive for technical functions as allowed by 36/2023
- DTA - Design and tender assessment (Third party verifications of projects before tender) moved to construction scope
- CHS - CODAS HW and SW licences (including HW, licenses and joint development with F4E) . It is proposed to be moved to construction scope as added value
- MFT - Magnets Factory tests (moved to construction scope)
- IMU - In-vessel components mock-up's (moved to construction scope)

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Attachments

- Attachment 1 - List contracts to be awarded in 2025
- Attachment 2 - List of contracts awarded
- Attachment 4 - List of Contract in the 3-years span 2025-2027
- Attachment 5 - Technical services