



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 1/
19

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DTT Work-programme and Budget 2023

Project Details



DTT S.c.a r.l.

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Abstract

The present report describes the DTT Consortium work programme and defines the relevant budget for the

1.3	17/07/2023	Issue for Approval	G. Trovato G.M. Polli G. Granucci S. Carchella M. De Santis	A. Pizzuto V.Vaccaro	F. Romanelli	CDA
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DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 2/
19

External ID:
N.A.

Rev. 1.3

Rev.	Summary of Modifications
1.0	Issued for CTS review
1.1	Issued for Approval
1.2	Issued for Approval Implementing CDA comments
1.3	Re-phasing of construction costs and implemented the offer received from shareholders Eni and INFN



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 3/
19

External ID:
N.A.

Rev. 1.3

Index

1	Introduction.....	5
2	Construction costs (Works and Supply of Goods)	5
2.1	Work-package Tokamak Hall	6
2.1.1	Magnets (MAG)	6
2.1.2	Vessel and Out Vessel Components (OVC).....	7 6
2.1.3	Power_Supply_Systems (PSS).....	7
2.1.4	Diagnostics (DIA).....	8 7
2.1.5	Assembly (ASS)	8
2.1.6	Remote Handling Systems (RHS)	8
2.1.7	Divertor and In Vessel Components (IVC)	9 8
2.2	Work-package Heating and Current Drive	10
2.2.1	Electron Cyclotron Heating (ECH).....	10
2.2.2	Ion Cyclotron Heating (ICH)	11
2.2.3	Neutral Beam Injectors (NBI).....	11
2.3	Work-package Balance of Plant.....	12
3	Consortium Running Costs	13
3.1	Costs for DTT personnel and assigned personnel by the shareholders	13
3.2	Costs for technical services to be supplied through shareholders agreement and external contracts.....	13
3.3	Costs for External Facilities utilization and R&D	15
3.4	Operating costs.....	16
3.5	Summary of DTT running costs and Shareholders “in-kind” contribution	17
4	ENEA's Activities assigned to DTT	18



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 4/
19

External ID:
N.A.

Rev. 1.3

Acronyms and abbreviations

BOP	Balance of Plant
CODAS	Control & Data Acquisition System
Dlgs.	Legislative Decree
HCD	Heating & Current Drive
ICT	Information and Communication Technology
PNRR	Piano Nazionale di Ripresa e Resilienza (Next generation EU funds)
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



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 5/
19

External ID:
N.A.

Rev. 1.3

1 Introduction

This document describes the work-programme of the DTT Consortium and defines the relevant budget for the year 2023. 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 preparation of the present document is carried out together with full life plan since the publication of annual financial statement and three-year plan is a statutory obligation for public institution in Italy.

Accordingly, the information herein provided are consistent with the ongoing update of full life plan.

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 2023. The spending allocation has been defined in accordance with the planned receipt of the invoices from contractors and suppliers.

The full life costs and relevant qualifications are provided in the project full life plan.

The budget has been allocated in accordance with the project Work Break-down Structure and with the Product-Break-down Structure (PBS), spread sheet nr.6.

All the items of the PBS have been included, even if no spending is foreseen in 2023.

In the following table it is reported a summary per each work-pack of the original budget and the new 2023 forecast. The facilities funded by PNRR included in the EPIC costs and the additional works relevant to the remote handling facilities, to be built by ENEA, funded by PNRR grant are reported separately; the latter is part of PBS but it is not included in the EPIC costs.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 6/
19

External ID:
N.A.

Rev. 1.3

	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
THM	393.412,00	75.313	33.298
of which THM PNRR only		3.000	4.600
HCD	101.416,00	14.322	16.722
of which HCD PNRR only		3.105	2.985
BOP	119.200,00	22.000	500
Total DTT Facilities	614.028	111.635	50.520
of which DTT Facilities PNRR		6.105	7.585
RH Training Facilities (PNRR out of EPIC)	1.200	360	-
Total PNRR		6.465	7.585
Total DTT	615.228	111.995	50.520

In the following sections are reported the details of each work-pack.

2.1 Work-package Tokamak Hall

The breakdown for each level 2 WBS item is reported in the following tables and is compared with the 2023 budget approved.

2.1.1 Magnets (MAG)

Most of the 2023 expenses are still relevant to the ongoing supplies for the Toroidal Field Coil Magnet (TFC) and for the Cables and Strands (CAS).

Some of the activities relevant to the contracts with ASG and SIMIC (under TFC work break-down element) have been postponed to 2024 due to ongoing negotiations with both vendors.

The conductors for PF, to be supplied through ICAS contract (CAS WBE) have been postponed to 2024 waiting for the final definition of the PF bidding documentation.

Luvata contract for the Nb3Sn strands has been terminated and a new tender procedure has been kicked-off by ENEA in June; only the advance payment is now foreseen within 2023.

Central solenoid tender (CSC) has been postponed to 2024 to perform additional experimental activities.

Cryoplant (CRY) tender process has been moved to 2024 in order to complete the design of magnets, thermal shield and auxiliary systems.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 7/
19

External ID:
N.A.

Rev. 1.3

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
TFC_Toroidal Field Coils Magnet	50.295	16.819	2.627
CSC_Central Solenoid Coils Magnet	11.300	2.260	
PFC_Poloidal Field Coils Magnet	16.100	3.220	3.920
CLC_Current Leads and Coldbox	5.000	-	
CAS_Cables and Strands	74.600	10.346	8.840
SCF_Super Conducting Feeders	400	80	
ICC_In Vessel Coils Conductors	300	60	60
QDS_Quench Detection & Safety Discharge Requirements	-	-	
CRY_Cryogenic_System	22.500	4.500	
Total 5.1.1_MAG	180.495	37.285	15.447

2.1.2 Vessel and Out Vessel Components (OVC)

In 2023 the procurement activities for VVP Vacuum Vessel and Ports are confirmed and the advance payment for the amount of 20% of the contract is expected.

On the contrary, thermal shield, cryostat base and pumping system tender processes have been postponed to 2024.

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
VVP_Vacuum Vessel and Ports	25.500	5.100	5.000
CRS_Cryostat Structure	7.500	-	
THS_Thermal Shield	3.000	600	
SUP_Supporting Structures	1.500	300	
VPS_Vacuum Pumping System	3.526	337	
FCS_Fueling Control Systems	337	-	
CLS_Machine Cleaning (conditioning) System	1.300	-	
ICA_In vessel Coils Axial symmetric	-	-	
ICN_In vessel Coils Not axial symmetric	2.700	-	
STP_Stabilization Plates	-	-	
Total 5.1.2_OVC	45.363	6.337	5.000

2.1.3 Power_Supply_Systems (PSS)

The timeline required by PNRR has accelerated the following procurement activities, belonging to PSS WBS and funded by PNRR:

- VSS_Vertical Stabilization coils power Supplies
- DIS_Divertor coils power Supplies
- NAS_Not-Axisymmetric coils power Supplies

PF and CS magnets power supply tender processes have been postponed to 2024.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 8/
19

External ID:
N.A.

Rev. 1.3

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
5.1.3.1_TFS_TF Magnet Power Supply	11.000	2.650	2.089
5.1.3.2_PFS_PF Magnet Power Supply	23.000	4.600	
5.1.3.3_CSS_CS Magnet Power Supply	23.000	6.900	
5.1.3.4_VSS_Verical Stabilization coils power Supplies - PNRR	8.000	1.500	1.400
5.1.3.5_DIS_Divertor coils power Supplies - PNRR	5.500	700	2.000
5.1.3.6_NAS_Not-Axisymmetric coils power Supplies - PNRR	2.000	800	1.200
5.1.3.7_DBS_Dc Busbars	3.200	-	
5.1.3.8_OPC_Other Ps Components	800	-	
5.1.3.9_CSP_Control System Power Supply	-	-	
Total 5.1.3 PSS	76.500	17.150	6.689
Total 5.1.3 PSS PNRR Only		3.000	4.600

2.1.4 Diagnostics (DIA)

Most of 2023 diagnostics engineering activities will be performed within Eurofusion WPDIV-IDTT; Eurofusion contribution to DTT shall be considered construction costs and then shall be charged on the construction budget. The planned budget for 2023 is confirmed but the WBS has been completely redefined and a comparison with the old budget is not feasible. Here below it is reported only the forecast according to the new WBS.

WBS item	WP&B 2023 Rev. 1.3
5.1.4.1_DTL_Diagnostic Bolometers and SXR Tomography, SXR Imaging	230
5.1.4.2_DIP_Diagnostic Interferometry and Polarimetry	148
5.1.4.3_DSP_Diagnostic Active and Passive Spectroscopy	87
5.1.4.4_DGN_Diagnostic Neutrons and Gammas	183
5.1.4.5_DMA_Diagnostic Magnetic Sensors	465
5.1.4.6_DwL_Diagnostic Embedded, IR/VIS cameras and PwI	330
5.1.4.7_DEE_Diagnostic Electron-cyclotron Emission	32
5.1.4.8_DRE_Diagnostic Reflectometry	56
5.1.4.9_DTS_Diagnostic Thomson Scattering Systems	60
5.1.4.10_DRA_Diagnostic Run Aways	86
5.1.4.11_DFP_Diagnostic Fast Particles	34
	1.712

2.1.5 Assembly (ASS)

No construction assembly costs are planned in 2023.

2.1.6 Remote Handling Systems (RHS)

In 2023 the following procurement activities, belonging to RHS WBS, are expected to start:

- RHB_RH Boom
- RHD_RH Divertor handling
- RHW_RH cut & Weld tools



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 9/
19

External ID:
N.A.

Rev. 1.3

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
5.1.6.1_RHB_RH Boom	6.163	1.000	500
5.1.6.2_RHD_RH Divertor handling	2.540	900	300
5.1.6.3_RHC_RH Casks	660	-	-
5.1.6.4_RHF_RH inboard Fw lifting	300	-	-
5.1.6.5_RHH_RH Hot room manipulation	500	-	-
5.1.6.6_RHT_RH Training facility	-	360	-
5.1.6.7_CRH_Control System per RH	870	-	-
5.1.6.8_RHW_RH cut & Weld tools	700	400	50
Total 5.1.6_RHS	11.733	2.660	850
Total 5.1.6_RHS PNRR Only		360	-

There are not planned costs for remote handling training facility; it is reminded that, even if it is part of DTT WBS, this facility is not included in DTT construction as reported in the EPIC but is funded by PNRR grant then it is managed by ENEA with DTT guidance and resources.

2.1.7 Divertor and In Vessel Components (IVC)

The planned expenses for IVC have been postponed waiting for the definition of poloidal and toroidal profile of the divertor. The 2023 are relevant to the supply of the mock-up.

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
5.1.7.1_DIV_Divertor	34.800	9.119	3.000
5.1.7.2_FwA_First Wall	10.000	1.500	600
Total 5.1.7_IVC	44.800	10.619	3.600



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 10/
19

External ID:
N.A.

Rev. 1.3

2.2 Work-package Heating and Current Drive

The breakdown of HCD spending from 2023 and the comparison with the previous approved plan is reported in the following table:

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.0	WP&B 2023 Rev. 1.3
5.2.1_ECH_Electron Cyclotron Heating			
5.2.1.1_EPS_ECH Power Supply	14.240	4.880	4.000
5.2.1.2_ERS_ECH RF Source	39.026	6.337	9.737
5.2.1.3_ETV_ECH Transmission Line & Vacuum	8.300		
5.2.1.4_ECL_ECH Launcher	2.400		
5.2.1.5_EDG_ECH Diagnostics	1.600		
5.2.1.6_ECS_ECH Control System	2.700		
5.2.1.6bis_ECS_ECH Control System PNRR		55	55
5.2.1.7_EMS_ECH Mechanics Structure	2.700		
Total 5.2.1_ECH	70.966	11.272	13.792
Total 5.2.1_ECH PNRR Only		55	55
5.2.2_ICH_Ion Cyclotron Heating			
5.2.2.1_TXI_Transmitter Integrated	20.000		
5.2.2.1bis_TXI_Transmitter Integrated PNRR		2.900	2.800
5.2.2.2_TLM_ICH Transmission line & matching	6.800		
5.2.2.2bis_TLM_ICH Transmission line & matching PNRR		110	110
5.2.2.3_VFT_ICH Vacuum feedthrough	250		
5.2.2.4_ANT_ICH Antenna	2.000		
5.2.2.5_IDG_ICH Diagnostics	500		
5.2.2.6_CPS_ICH Control and Protection System	400		
5.2.2.6bis_CPS_ICH Control and Protection System PNRR		40	20
5.2.2.7_AUS_ICH Auxiliary units and structures	500		
Total 5.2.2_ICH	30.450	3.050	2.930
Total 5.2.2_ICH PNRR Only		3.050	2.930
TOTAL HCD	101.416,00	14.322,00	16.722,00

The cash-out are mainly relevant to the purchase of pre-series gyrotron and to the prepayment of the 15 series Gyrotrons from Thales, the prepayment of the contract for the gyrotron high voltage power supplies (modified after the result of the market survey) and the procurement of the first two ICH transmitters (under PNRR).

In the following sections further details about the tenders planned are provided.

2.2.1 Electron Cyclotron Heating (ECH)

The tender planned in 2023 are:

- Gyrotron High Voltage Power Supply, expected to be awarded in Q4 of 2023. The considered cost is the 20% for the prepayment. The tender will be done for the purchase of 8 module, capable to feed 16 gyrotrons. As a consequence of the market survey the total cost of the Power supply has been increased (20 M€ instead of 12.8 M€, mainly due to the increased cost of energy and material).
- RF Load, planned for Q4 of 2023. The cost is the 20% of the prepayment and the completion of the first load.

It is expected also to procure part of the ECH Control System.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 11/
19

External ID:
N.A.

Rev. 1.3

For the supply of the gyrotron is expected to sign the Specific Contract #2 for the 15 gyrotron for a total expense of 32 M€. The reported cost is therefore the prepayment for the SC#2 (20% = 6.4 M€)and the completion of the payment for the pre-series gyrotron (3.037 M€) that is scheduled to be delivered at the end of November 2023.

2.2.2 Ion Cyclotron Heating (ICH)

The planned tenders for 2023 are:

- Solid State Transmitter, the tender has been launched in June of this year The cost is for the prepayment of 20%.
- Test Bed components. The procurement will be limited, in this phase, to the components needed for the connection of the Transmitter under test to the load, that will part of the supply. The tender is foreseen for Q4 of 2023.
- Control System for Test bed. This part of the ICH system will be used to set up the ICH test bed.

These 3 items are funded by PNRR and the are managed by ENEA with DTT guidance and resources.

2.2.3 Neutral Beam Injectors (NBI)

As described in the Full life project cost document PMC-GEN-03002 rev2, the capex for the Neutral Beam Injectors (NBI) have been deferred to the exploitation phase of DTT facilities and the execution is foreseen from 2028 onwards. Accordingly, the relevant spending is not included in the DTT construction costs.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 12/
19

External ID:
N.A.

Rev. 1.3

2.3 Work-package Balance of Plant

The issue of the state-owned area of the Vaccaro Ditch is still affecting the progress of the new buildings works that are now planned to start in 2024.

ENS is now planned to start in 2024: we are in the process of awarding a contract to a specialized company with the aim of preparing a unique project with HVS and including the cost saving opportunities identified. The HVS cost, funded by Lazio local government, are no reported in this table because are included in the ENEA's activities section.

The construction activities for the opening of new gates and the demolition of buildings 73 and 90, originally included in new buildings scope of work, are planned to start within 2023.

WBS item	PMC-GEN-03002 rev2.0 (Full Life project CAPEX last revision)	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
5.3.1_AUX_Auxiliary_Plant_Systems			
5.3.1.1 WCS_Water_Cooling_System	32.000	6.800	-
5.3.1.2 OAS_Other_Auxiliary_Systems	2.000		-
Total 5.3.1 AUX	34.000	6.800	-
5.3.2_BUI_Building_and_Services			
5.3.2.2_THB_Tokamak_Hall_and_New_Buildings	45.200	9.200	-
5.3.2.4_OCW_Other_Civil_Works	3.000		500
Total 5.3.2 BUI		9.200	500
5.3.3_ENS_Electrical_Network_Systems			
5.3.3.1_EDS_Electrical_Distribution_Systems	30.000,00	6.000	
Total 5.3.3 ENS	30.000	6.000	-
5.3.4_AUT_Control_Safety_Security_Telecommunication_Systems			
5.3.4.1_CCR_Central_Codas_&_Control_Room		-	
5.3.4.2_PCP_Plasma_Control_&_Protection		-	
5.3.4.3_NET_Networks		-	
5.3.4.4_PSH_Plant_System_Hosts		-	
5.3.4.5_FGS_Fire_&_Hazardous_System		-	
5.3.4.6_PAS_Personnel_Access_System		-	
5.3.4.7_SEC_Security_Systems		-	
5.3.4.8_TEL_Telecommunication_Systems		-	
Total 5.3.4 AUT	7.000	-	
TOTAL BOP		22.000,00	500,00



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 13/
19

External ID:
N.A.

Rev. 1.3

3 Consortium Running Costs

The running costs of the consortium are excluded from the EPIC agreement and 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, are included in the full life plan of the project.

The running cost have been divided into 4 groups:

1. Costs for DTT personnel and assigned personnel by the shareholders
2. Costs for technical services to be supplied through shareholders agreement and external contracts
3. Costs for external Facilities utilization and R&D
4. 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:

- Seconded personnel from shareholders.
- Available personnel from shareholders, covering coordinating roles (part-time).
- Direct hired personnel (including collaboration contracts).

In the following table a summary of personnel foreseen in 2023 for the consortium and the relevant estimated costs are shown. It has to be noted a decreased of the direct hired personnel being the hiring process still ongoing.

Internal PY	PY	K€
Seconded personnel by Shareholders	36,30	2.904,00
Available personnel from Shareholders	12,50	1.000,00
DTT Direct Hired Personnel	12,15	972,38
Total	60,95	4.876,38

In order to estimate the cost of the internal personnel an average cost of 80 K€/PY has been used for secondees and available personnel from shareholders while the DTT direct hired personnel cost has been calculated in accordance to the real wages and social security contributions

The split among shareholders of internal PY is reported in section 3.5.

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 (including hardware), the framework contract with Ansaldo Nucleare and other external contracts.

These resources have been evaluated in the Full Lifetime Plan, whose year phasing till the first plasma is presently under revision. At the beginning of 2022 a Call has been launched to determine the interest of the



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 14/
19

External ID:
N.A.

Rev. 1.3

DTT shareholders in participating in the 50 projects in which the design activities have been divided¹. An evaluation of the resources needed for the engineering support (design office, etc.) has been also made.

This request will be covered by the shareholders contribution and the resources from the engineering support framework contract with Ansaldo Nucleare.

The summary of external PY and the relevant split is shown in the following table:

External PY	Shareholders	Eurofusion	ANN (FWA)	Total
Management	10,31	0,0	4,67	14,98
Physics	13,51	0,0	0	13,51
System Integration	13,08	0,0	0,00	13,08
Hall	51,49	0,0	25,46	76,95
HCD	19,50	0,0	1,83	21,33
BoP	4,58	0,0	0	4,58
Total	112,48	0,00	31,96	144,43

The details of the budget 2023 for the external technical services including business trips, industry contracts and hardware costs under shareholders responsibility is shown in the following table.

Costs for external technical services (K€)	Business Trips	Hardware& Industry contracts	Cost of PY	WP&B 2023
Management			1.723,67	1.723,67
Physics			1.167,50	1.167,50
System Integration			1.418,90	1.418,90
Hall			8.150,15	8.150,15
HCD			1.865,94	1.865,94
BoP			721,88	721,88
Total	523,23	4.251,00	15.048,02	19.822,26

A relevant part of the hardware cost in THM and HCD WPs are carry-over of 2022 activities.

The split among shareholders of the external PY and other expenses is reported in section 3.5.

¹ The list of the projects is provided in attachment 1 WBS, spreadsheet ABS.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 15/
19

External ID:
N.A.

Rev. 1.3

3.3 Costs for External Facilities utilization and R&D

This item includes the cost for the use of the ENEA Coil cold Test Facility for a total of 5.4M€ (estimated as 27 tests at a cost of 200k€ each) and the cost of the Remote Handling Facility. The latter is not part of the scope of construction but will be financed through the PNRR grant. It is expected that ENEA will officially request DTT to take charge for the DTT facility in the next months. This will require an update of the construction contract.

For 2023 no use of the Coil cold Test Facility is expected.

For the qualification of the cable in-conduit conductors, current tests shall be performed in SULTAN facility at EPFL in Switzerland. Three of the seven tests foreseen in the research contract signed with EPFL have been already carried out in 2022. The cost of the tests performed so far amounts to 333 k€. In 2023, the remaining four tests will be performed for corresponding 473 k€.

Additionally, tests of the strands during production and after heat treatment at the coil manufacturers shall be performed. At this aim, 60 k€ have been set aside.

The details of the complete tests plan will be provided in the full life plan.

In the following years tests of the conductors during production are foreseen and at this aim 1.46 M€ have been set aside. Also 300 k€ are included in the budget for tests of the qualification joints of the PF and CS and finally 150 k€ are left for testing joints of the feeders and current leads.

According to the previous reconstruction an overall amount of 3.9 M€ are left for the use of facilities within the MAG WBS. Of this 600 k€ shall be used in 2023 for the testing of the remaining conductor during qualification and production and for the testing of a qualification joint.

Within the assembly project 200 k€ have been left for preparing and testing mock-ups outer coil connection joints of the TF coils.

Finally, for qualifying the divertor and first wall design testing of specific mock-ups is foreseen in several European high heat flux facilities. An amount of 360 k€ has been foreseen at this aim.

Costs for external Facilities utilization and R&D	WP&B 2023
Superconductors tests (ENEA cold test facilities)	-
In-conduit conductors testing during qualification and production and joints testing (SULTAN EPFL Facilities)	600
Strands testing	60
R&D for TF OIS Assembly	200
Divertor and first wall mock-ups testing	360
Gyrotrons testing (Falcon EPFL Facilities)	-
Total	1.220



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 16/
19

External ID:
N.A.

Rev. 1.3

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.

In the following table the 2023 budget for above mentioned activities is shown while in the continuation of the chapters a brief description of each item and the relevant assumptions for the estimate are reported.

Operating Costs (k€)	WP&B 2023 rev. 1.2	WP&B 2023 rev.1.3
Corporate Bodies	226,9	226,9
Management (anticorruption law 231, Legal assistance, Tender notice, logistic, services, etc.)	1.939,6	1.341,0
ICT (upgrade of the DTT HW/SW infrastructure)	350,0	493,1
Business trips (procurement follow up of DTT personnel)	150,0	75,0
Participation to conference and outreach material	95,0	95,0
System Integration	1.100,0	1.100,0
TOTAL	3.861,5	3.331,0

- **Corporate bodies**
 - These costs include the costs of the Administration Council and the Statutory Auditors and have been estimated on the basis of the costs in the years 2020 and 2021;
- **Management costs**
 - Costs for the *Organismo di Vigilanza* foreseen for the application of the anticorruption law (Dlgs. 231/01): 38 k€
 - Costs for the selection of the newly hired personnel and of the Project Manager 136 K€
 - External legal assistance: 25 k€
 - Statutory auditing: 46 K€
 - Small external contracts and other management costs (Data Protection Office, Tender publication, internal audit, other personnel costs etc.): 80 k€
 - Training courses for newly hired personnel and personnel that is going to cover special roles (e.g. RUP) have been evaluated in 25 participations at a cost of 1500€ each for a total of 37.5k€ plus training for shareholders assigned personnel (35 K€)
 - PhD fellowships include the fellowships launched in the past three years and partially co-financed (278k€) and the launch of 10 additional fellowships (220k€).
 - Insurance costs (60k€) and costs for personnel incentives art 113 Dlgs 50/2016 (45 k€).
 - Logistic and renting services 340 K€
- **ICT costs (Hardware and Software):**
 - These costs include the upgrade of the DTT HW/SW infrastructure, the ICT activities linked to the anti corruption law (Dlgs. 231/01), the framework contract for the management of the DTT documentation, the DTT access to the GARR network and the computer for the people that will be hired by DTT in 2023.



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 17/
19

External ID:
N.A.

Rev. 1.3

- **Mission costs for the procurement contract follow-up:**
 - This item includes the missions by RUP, DEC and other DTT personnel and excluding the the QA/QC and expediting by external firms. Due to the postponement of some procurement processes to 2024 the relevant estimate has been reduced.
- **Participation to conferences and outreach material**
 - Participation to conferences: Assuming 30 professionals involved in technical activities among the personnel assigned or directly hired the forecast has been made on the basis of a participation in conferences with the following distribution: 50% in Europe, 20% outside Europe and 30% in Italy. On the basis of the past experience the estimated cost is 4k k€ for a conference outside Europe, 2.5k k€ for a conference in Europe and 1.5k k€ for a conference in Italy for a total of 55k€.
 - Stands including attending personnel for five events (FEC, ISFNT, ICFRM, APS +1) 18k€.
 - Outreach material: 2 k€.
 - On-site organization of international meetings (CTS, Research Plan, etc.): 20 k€.
- **System Integration** includes the costs of:
 - Engineering assessment as required by Legislative Decree 50/2016 before to issue the relevant tender: 900k€.
 - Hardware and Licenses necessary for CODAS group activities: 50k€
 - Site investigations and permitting activities: 150k€

3.5 Summary of DTT running costs and Shareholders “in-kind” contribution

In the following table all the previous described consortium running costs and the shareholders “in-kind” contribution are shown:

Summary of DTT running costs (K€)	WP&B 2023
Internal PY (DTT personnel costs)	972
Internal PY (Shareholders assigned personnel costs)	3.904
External technical services costs	19.822
Costs for external Facilities utilization and R&D	1.220
Operating Costs	3.331
Total	29.250



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 18/
19

External ID:
N.A.

Rev. 1.3

Shareholders "In-Kind" Contribution	Shareholders External Services					Shareholders Internal PY		Total (K€)
	PY (Nr.)	Cost of PY (K€)	Industry Contract (K€)	Other Expenses (K€)	Missions (K€)	PY (Nr.)	Cost of PY (K€)	
ENEA	35,90	3.590,00	215,00	889,00	184,33	32,75	2.620,00	7.498,33
Eni	26,72	3.379,69	2.474,40	-	105,90	10,00	800,00	6.759,99
INFN	3,61	357,50	-	264,60	16,00	-	-	638,10
CREATE	9,85	985,42	-	5,00	51,33	0,50	40,00	1.081,75
RFX	9,26	925,83	40,00	204,00	46,33	3,75	300,00	1.516,17
CNR	6,71	570,83	-	134,00	17,33	1,30	104,00	826,17
POLITO	8,99	899,17	10,00	-	41,33	-	-	950,50
UNIMIB	0,88	87,50	-	-	2,00	-	-	89,50
UNIROMA2	5,54	554,17	-	15,00	29,83	-	-	599,00
UNITUS	5,02	502,08	-	-	28,83	0,50	40,00	570,92
Total	112,48	11.852,19	2.739,40	1.511,60	523,23	48,80	3.904,00	20.530,42

An average cost of 100 K€/PY, including overheads, has been used for the estimation of shareholders personnel costs except for Eni and INFN that have submitted a formal offer. Eni personnel costs have been calculated in accordance to the tariffs included in the existing framework agreement for services provision between DTT and Eni. However, it has to be noted that the Eni's industry contracts provide additional services at a reduced cost and then the final average costs of all the resources made available is close to 100 K€/PY.

To be noted that CNR external PY include 1 PY free of charge.

4 ENEA's Activities assigned to DTT

The consortium is carrying out some preliminary activities assigned by ENEA. The forecasted spending for 2023 is reported in the following table compared to the previous estimate. Further to the activity included in the appendix 2 of the EPIC new activities are now under DTT responsibility:

- 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
- Waterproofing of the roof of the buildings 84, 88, 89, 26 and 11: the bid of this part of the existing buildings preparation has accelerated due to the entry into force of the new Italian Code of Public Contracts (Legislative Decree 31/03/2023, n. 36) that foresees new requirements for the qualification of the Contracting Authority; accordingly DTT shall award a work contract above 500 K€ by the end of this year to fulfill with the new requirements.

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

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

	Full Life Costs	WP&B 2023 Rev. 1.2	WP&B 2023 Rev. 1.3
Building Refurbishment	15.196,00	3.200	100
HVS	19.145,44	3.800	-
Beryllium and Vaccaro Ditch	319,34	252	196
UXO Clearance	110,00	110	moved to running cost
Roof Waterproofing	540.338,41	-	350
MV connection to INFN	TBD	-	50
Revamping electrical distribution system	TBD	-	40
Total ENEA's Activities	TBD	7.362	736



DTT Work-programme and Budget 2023 (including Construction and Consortium running costs)

DTT ID:
PMC-GEN-03006

Page: 19/
19

External ID:
N.A.

Rev. 1.3

These activities are financed 100% by ENEA and put on a specific budget order in the DTT budget.
The next revision of the full life plan will be updated accordingly.

Attachments

1. WBS-LST-40000_3.2